ESCULAPIO

JOURNAL OF SERVICES INSTITUTE OF MEDICAL SCIENCES, LAHORE.

VOLUME 17 APRIL - JUNE 2021 ISSUE 02

PUBLISHED BY

ESCULAPIO OFFICE, GYNAE UNIT II, SERVICES HOSPITAL LAHORE
PHONE: 042-99204879, WWW.ESCULAPIO.PK

ONLINE EDITION

VISIT THE WEBSITE FOR ONLINE: WWW.ESCULAPIO.PK
FOR SUBMISSION: PUBLICATIONS@ESCULAPIO.PK

COMPOSED BY

AMEER ALI

PRINTED BY

TALAL PUBLISHERS
9- ROSE CENTRE, KABIR STREET, URDU BAZAR LAHORE
0300-4327951

TABLE OF CONTENTS

Guest Editorials

Original Articles

TABLE OF CONTENTS

Global Epidemic of Hearing Loss: Challenges and Opportunities for Pakistan

Sher T. MD.

How to cite: *MD. S. Taimur, Global Epidemic of Hearing Loss: Challenges and Opportunities for Pakistan. Esculapio 2021;17(02):110-112.*
DOI: ***https://doi.org/10.51273/esc21.25172***

Hearing is a special sense that across the lifetime allows us to engage with environment, communicate with fellow beings, express our thoughts, gain education, seek employment and opportunities to improve quality and standard of lives for ourselves, our families and the communities we live in. It is not surprising that hearing loss, an *invisible* disability, can be devastating not only for the individual suffering from it but for their families, communities and society at large.

Burden of Hearing loss across the globe and in Pakistan:

On March 3rd, 2021 the World Health Organization (WHO) published the first-ever *World Report on Hearing.* This comprehensive document described the global burden of hearing loss, its distribution amongst member nations and the status of hearing health care[1]. Concurrently, in an article published in *The Lancet*, the Global Burden of Disease (GBD) 2019 Hearing Loss Collaborators highlighted the trends in global hearing loss over the last 30 years and its impact on the years-lived with disability (YLD)[2]. Using the data from 1990 to 2019 the GBD group made predictions for 2050 that are a cause of concern for health care systems, policy makers, people living with hearing loss and society at large. This is particularly of alarm for low- and middle-income countries such as Pakistan.

An estimated 1.57 billion people across the world had some degree of hearing loss in 2019, accounting for 20.3% of global population.[3] Of these, 466 million people have disabling hearing loss that includes 34 million children. Vast majority of people with hearing loss (80%) live in low- and middle-income countries. The burden of hearing loss as measured by the years-lived with disability increased by 73% from 1990 to 2019 as 43 million years of quality of human life time was lost due to hearing related disability in 2019 alone.[2] While there are no large-scale Data indicating the exact incidence and prevalence of hearing loss in Pakistan, a survey conducted in 1998, noted a point prevalence of 8% in a sample of 607 children.[4]

Impact of Hearing Loss

The impact of hearing loss depends on several factors; the most important being the age of onset, severity, socioeconomic status of the family and the country people with hearing loss live in, the public health infrastructure and the access and quality of hearing healthcare.

In children, hearing loss is particularly damaging as if unaddressed it leads to poor language development, lack of communication, poor self-esteem, lack of schooling, behavioral and mental health issues. Continuing into adulthood these issues lead to poor social connectivity, isolation, anxiety, depression and lack of employment. Parents and families caring for children with hearing loss suffer emotional and psychological distress, loss of family income and decline in quality of life.[5]

Adult onset hearing loss is typically the result of excessive noise exposure (from occupation, increased ambient noise or personal audio devices). It can result in loneliness, isolation, declining quality of life, increased risk of depression and anxiety. There is increasing evidence that hearing loss in adult life is associated with poor outcomes in patients suffering from chronic medical comorbidities such as diabetes, hypertension, coronary artery disease and the likes.[6] Furthermore, it increases the risk of dementia by 9%.[7] Adult onset hearing loss also takes significant toll at the family and close relationships and the patients become increasingly isolated fueling the vicious circle of loneliness and depression. This also results in decline in gainful employment and adds significant burden to the healthcare systems.

1. Taimur Sher MD

Correspondence:
Taimur Sher MD, Professor of Medicine, Consultant Hematologist and Medical Oncologist, Mayo Clinic.

Submission Date: 22-05-2021
Acceptance Date: 27-05-2021

Why urgently addressing Hearing loss is important for Pakistan?

Using a conservative estimate of population level prevalence of 15% it is expected that there are 34 million people living with some degree of hearing loss in Pakistan including approximately 6.5 million children. As noted in the GBD study these numbers are expected to grow by 56% in the year 2050. The WHO very conservatively estimates the annual global cost of unaddressed hearing loss to be close to 1 trillion US dollars. Health-care sector cost for providing care for children and adults with hearing loss is estimated to be around $314 billion. This does not include the cost for provision of services and rehabilitation. The primary education cost for children with hearing loss between age 5-14 years is $27 billion in excess of that for their normal hearing peers. The cost related to unemployment and premature retirement is estimated to be $182 billion. More importantly, cost to the humanity resulting from social isolation, communication difficulties and stigmatization of hearing loss is an additional $456 billion- The *World Report on Hearing* notes these costs to be a very conservative estimate.[1,8] It is clear that unaddressed hearing loss is a direct contributor to poverty and declining socio-economic status and addressing this epidemic should be a priority at all levels of human-social enterprise.

What should be done?

It is clear that the implications of unaddressed hearing loss for low- and middle- income countries such as Pakistan are colossal. Awareness is the first step in solving any problem. Engaging various stakeholders from public and private sector to coordinate the health awareness campaigns around March 3rd as the world hearing day will go a long way to engage public.

Approximately, 60% of childhood hearing loss can be prevented by preventive health services that include vaccinations, family education on nutrition and hearing health, early identification and treatment of ear infections. Several initiatives of the recently rolled out comprehensive *Ehsaas* program by the Poverty Alleviation and Social Safety Division can provide a great platform to address this epidemic. The *National Socio-Economic Registry 2020,* in addition to advising policymakers, will provide much-needed data to prioritize funding for resource allocation. Coordinating and escalating existing vaccination drives to provide comprehensive vaccination coverage to population against the organisms causing otitis media is a critical step to reduce the burden of childhood hearing loss. Hearing health screening at school entry should be an important focus as timely intervention at this stage can prevent the vicious circle of personal and social decline in children with hearing loss and their families. Access to assistive technologies and rehabilitative services is critical so effective interventions can ensure that a child with hearing loss can continue with education attainment. Trained social workers and guidance and career counselors working with the departments of education and health can be a great resource as these children walk into adulthood.

Educational campaigns focused on general public and private sector should raise awareness on the impact of noise pollution. Medical school education should increase focus on preventive services and family and population counseling on healthy hearing related lifestyle interventions. Such interventions include increasing awareness of noise pollution, monitoring and reducing exposure to "toxic" levels of sound through personal audio devises and use of proper protective equipment for high risk occupational roles.

Investing in and developing a competent workforce of audiologists, otolaryngologists and speech therapists is critical to meet the needs of this growing group of vulnerable people. Legislative and policy making efforts should focus on providing access to technology that can address the communication needs.

In summary, Pakistan is at the forefront of the global hearing loss epidemic. If unaddressed this would be a significantly strain to the human, societal and financial capital of the country. The good news is that with proper planning, co-operation, stakeholder engagement and resource management cost effective interventions can change the trajectory and significantly improve the lives of Pakistanis living with hearing loss and contribute to the economic and social uplifting of the country.

References

1. Hearing, W.r.o., World report on hearing. Geneva: World Health Organization; 2021. Licence: CCBY-NC-SA 3.0 IGO., WHO, Editor. 2021.
2. Collaborators, G.B.D.H.L., Hearing loss prevalence and years lived with disability, 1990-2019: findings

from the Global Burden of Disease Study 2019. Lancet, 2021. 397(10278): p. 996-1009.
3. Wilson, B.S. and D.L. Tucci, Addressing the global burden of hearing loss. Lancet, 2021. 397(10278): p. 945-947.
4. Elahi, M.M., et al., Paediatric hearing loss in rural Pakistan. J Otolaryngol, 1998. 27(6): p. 348-53.
5. Wilson, B.S., et al., Global hearing health care: new findings and perspectives. Lancet, 2017. 390(10111): p. 2503-2515.
6. Lee, W., et al., Hearing Loss and Risk of Overall, Injury-Related, and Cardiovascular Mortality: The Kangbuk Samsung Health Study. J Clin Med, 2020. 9(5).
7. Liu, C.M. and C.T. Lee, Association of Hearing Loss With Dementia. JAMA Netw Open, 2019. 2(7): p. e198112.
8. Organization, W.H., Global costs of unaddressed hearing loss and cost-effectiveness of interventions. Geneva Switzerland; 2017. 2017.

Association of Various Subtypes of Renal Cell Carcinoma with Smoking, Grading and Staging

Saniah Bashir,[1] Afifa Rizwan Virk,[2] Syed Mujtaba Haider,[3] M. Fayzan Mehmood,[4] Rahat Sarfraz,[5] Samina Qamar[6]

Abstract

Objective: To determine the association of various subtypes of Renal Cell Carcinoma with smoking, grading and staging.

Methods: A descriptive cross-sectional study was conducted in the Pathology and Oncology departments of King Edward medical University, Lahore from April 2019 to June 2020. A total of 226 cases were included in the study using purposive consecutive sampling. Association of tumor subtype with smoking, grade and stage of tumor was studied with the help of cross tabulation of these variables in SPSS 22.

Results: Out of the 226 cases, 57(25.2%) presented with high grade and 169(74.8%) with low grade RCC. Out of these, there were 98(43%) male smokers and 22(9.7%) female smokers.

When subtype was cross-tabulated against smoking (p=0.013) there were 74(32.7%) cases of clear cell carcinoma (including its subtypes sarcomatoid and rhabdosarcomatoid), 43(19.02%) cases of papillary RCC and 3(1.32%) cases of chromophobe RCC.

When subtype was cross-tabulated against stage (p=0.018), 62 (27.43%) cases of clear cell, 25(27.7%) cases of papillary and 3 (3.3%) cases of chromophobe variant presented at the T4 stage.

Conclusion: Chromophobe carcinoma of kidney is associated with smoking, higher grade and higher stage. We found no significant association of any other specific subtype with gender, smoking and grade of RCC.

Key Words: Renal cell carcinoma, grade, smoking, subtype stage.

How to cite: *Bashir S., Virk R. A., Haider M.S., Mehmood F.M., Sarfraz R. Association of various subtypes of Renal Cell Carcinoma with smoking, grading and staging. Esculapio 2021;17(02):116-120.*

DOI: ***https://doi.org/10.51273/esc21.251721***

Introduction

Renal Cell Carcinoma (RCC) is a prevalent kidney cancer that stands at the 8th place in adult neoplasms.[1] There are different subtypes of RCC based on their histologic, cytogenetic and molecular characteristics. A well-established association is exists between morphology and genetics of RCC[2]. A single subtype of RCC may be an assortment of diverse morphologies. Many a times, a single subtype comprises of 2 to 3 distinctive subtypes. Carbonic Anhydrase IX can serve as a useful marker in determining its differential diagnosis.[3] However for the selection of suitable treatment plan, specific diagnosis of its subtype is quite crucial. Staging is based on the size and pathological features of the tumor. Metastatic disease manifests in about 30% of the patients while tumor recurrence occurs in 40% of the patients.[4] While determining treatment plan and its effectiveness, factors influencing the prognosis portray a major role.[5] Patients with slow growing tumors and lesser metastatic risk can be kept under observation before the initiation of the treatment. On the contrary, cytoreductive nephrectomy will be required for patients with bad prognosis.[6] There is a well-established association between RCC and various environmental factors such as smoking, obesity, hypertension, estrogen and metal exposure.[7] Documented studies have demonstrated fluctuating relationship between smoking and various subtypes of RCC.[8] In this study, we tend to explore the relationship of various subtypes of RCC

1. Saniah Bashir
2. Afifa Rizwan Virk
3. Syed Mujtaba Haider
4. M. Fayzan Mehmood
5. Rahat Sarfraz
6. Samina Qamar

1-4: Student at King Edward Medical University, Lahore
5-6. Department of Pathology King Edward Medical University, Lahore

Correspondence:
Saniah Bashir Trunbo, *Student at King Edward Medical University, Lahore*
Email: mujtabakazmi1998@gmail.com

Submission Date: 17-03-2021
1st Revision Date: 29-03-2021
Acceptance Date: 24-04-2021

with smoking, grading and staging.

Methods

This was a descriptive cross-sectional study carried out at the Department of Pathology in collaboration with the Department of Oncology, King Edward Medical University, Lahore, from April 2019 to June 2020. The study was approved by Institutional Review Board (710/RC/KEMU)of the university in 2019. A total of 226 cases were selected using the databases of the involved departments. The inclusion criteria included all excisional/incisional, adequate biopsies of renal cell carcinoma after taking telephonic consent. Autolyzed / inadequate specimens and those patients who did not give consent or having insufficient clinico-radiological data for staging of tumor were excluded from the study. The subjects were either approached directly or via audio/video telecommunication. Complete history was recorded in 226 cases/patients out of 400 patients. Rest 174 patients did not have complete histological or radiological data to be included in the study.

The histological subtyping for each subject was undertaken according to the WHO classification (The International Society of Urologic Pathologists (ISUP) in 2012 suggested a grading system for clear cell RCC and papillary RCC, as follows:

Grade 1 = Inconspicous nucleoli at 400x magnification of microscope.

Grade 2= Clearly visible nucleoli at 400x magnification.

Grade 3= Clearly visible nucleoli at 100 x magnification

Grade 4= Extreme pleomorphism or rhabdosarcomatoid and/or sarcomatoid morphology.[9]

Staging was done with the help of TNM staging system 2019 i.e.T1: Tumor of kidney 4-7cm size, T2: tumor size >7cm, T3:Tumor extension into major veins, T4:Tumor reached adrenal gland or beyond.[9]

Quantitative variables like age were expressed as mean and standard deviation. Qualitative variables including gender, smoking, tumor type, stage and grade were analyzed by percentages, descriptive statistics and cross-tabulations.

Results

A total of 226 cases of Renal Cell Carcinoma were included in the study. Age of these patients ranged from 23 to 77 years of age with a mean age of 54.31± 9.185. 187 (82.7%) were males and 39 (17.3%) were females. Out of 226, 57 (25.2%) were low grade tumors and 169 (74.8%) were high grade tumors **(Table II)**. Similarly, 19 (8.4%) presented with T1, 23 (10.1%) with T2, 94 (41.5%) with T3 and 90(39.82%) at T4 stage of RCC **(Table I)**. Clear Cell Subtype (including its subtypes sarcomatoid and rhabdosarcomatoid variants) was found in 151 (66.8%) of the cases, Papillary Carcinoma in 71 (31.4%), and Chromophobe RCC in 4 (1.8%) cases.

Out of the 226 cases, there were 98(43%) male smokers and 22(9.7%) female smokers. When subtype was cross-tabulated against smoking (p = 0.013), there were 74 (32.7%) cases of clear cell carcinoma (including its subtypes sarcomatoid and rhabdosarcomatoid), 43 (19.02%) cases of papillary RCC and 3(1.32%) cases of chromophobe RCC**(Table III)**. Similarly among the non-smokers, there were 77(34.02%) cases of clear cell carcinoma, 28(12.38%) cases of papillary RCC and 1(0.44%) case of Chromophobe RCC. When subtype was cross-tabulated against stage (p=0.018, Table I), there were 10 (4.4%) cases at T1, 15 (6.6%) cases at T2, 64 (28.31%) at T3 and 62 (27.43%) cases at T4 stage for the clear cell variant of RCC. Similarly, 9 (3.9%) cases of papillary RCC presented at T1, 8 (3.5%) at T2, 29 (12.38%) at T3 and 25 (11.06%) at T4. There were null cases of chromophobe variant of RCC presenting at T1 and T2 while there was just one case of chromophobe RCC presenting at T3 and 3 (1.3%)

Table 1: *Cross-tabulation of Subtype and stage of tumor (p value=0.018)*

Tumour Size and Extent	Subtype			Total
	Clear cell	Papillary	Chromophobe	
Confined to kidney, 1-7 cm, T1	10(4.4%)	9(3.9%)	0	19(8.4%)
Confined to kidney, >7 cm,T2	15(6.6%)	8(3.5%)	0	23(10.1%)
Extension into major veins or perinephric tissues, but not into ipsilateral adrenal gland or beyond Gerota's fascia,T3	64(28.3%)	29(12.38%)	1(0.44%)	94(41.5%)
Involves ipsilateral adrenal gland or invades beyond Gerota's fascia,T4	62(27.4%)	25(11.06%)	3 (1.3%)	90(39.82%)
Total	151(66.8%)	71(31.41%)	4(1.8%)	226(100%)

Table 2: *Association of subtype of tumor with Grade (p=0.261)*

Grade	Subtype			Total
	Clear cell	Papillary	Chromophobe	
Low grade (Grade I,II)	43(19.02%)	13(5.75%)	1(0.44%)	57 (25.2%)
High Grade (Grade III,IV)	108(47.7%)	58(25.6%)	3(1.32%)	169 (74.8%)
Total	151	71	4	226

Table 3: *Association of RCC Subtypes with Smoking (p=0.013)*

Smoking	Subtype			Total
	Clear cell	Papillary	Chromophobe	
Smokers	74(32.7)	43(19.02%)	3(1.32%)	120
Non-Smokers	77(34.02%	28(12.38%)	1(0.44%)	106
Total	151	71	4	226

cases at T4 stage. Similarly when subtype was cross-tabulated with grade (p=0.261,Table II), there were 108(47.7%) cases reported as high grade clear cell and 43(19.02%) cases were low grade clear cell carcinoma. Papillary high grade tumors were 58 (25.6%) and 13(5.75%) were low grade tumors. The cases of chromophobe carcinoma with high grade nuclear features were 3(1.32%) and low grade were 1(0.44%).

Discussion

Tobacco use registers as a high risk, which is still avertable habit in industrialized nations. Tobacco is a well-known fount of aromatic hydrocarbons and nitroso compounds, all of which lead to bulky DNA adduct formation, single- and double-stranded DNA breaks, and base modifications, and hence can cause DNA damage.[10] These events complement an individual's tendency of genetic predisposition to smoking-related cancer like VHL mutations.[11] In US, the average age for diagnosis of RCC is 6412. Clear cell subtype manifests the greatest association with many modifiable and non-modifiable risk factors and is the most common histological subtype, succeeded by papillary and chromophobe.[13] A study conducted in India also demonstated clear cell variety to have association with advanced stage.[14] Another study from India showed 52.79 years to be the mean age of presentation. A study in Pakistan in the year 2011 revealed that the mean age of presentation was 56.3 years which was quite similar to Indian study as compared to the West that showed 64 years as mean age. The most common was Grade II (60%) followed by grade III (36%) and then grade IV (4%). Again in this study, clear cell variant once again appeared as the most frequent subtype (n=9; 69.2%).[15] The chromophobe type of renal cell carcinoma was very rare in their study, similar to our findings.[16]

Considering the trends of association of various subtypes with the stage of RCC as noticed in the previous studies, the clear cell subtype showed a less favorable outcome compared with papillary and chromophobe subtypes, and is more expected to present at an advanced stage, and shows a greater inclination towards metastasis.[17] A case report demonstrated RCC invading uterus, fallopian tube and bilateral ovaries was of clear cell subtype demonstrating grade 3 and final pathologic stage as pT4N1M1.[18] These studies support our findings of clear cell carcinoma being associated with advanced stages (T3 and T4) with p-value of 0.018(p<0.005) as 64(28.3%) and 62(27.4%) of the cases of RCC are of clear cell carcinoma in the T3 and T4 stages respectively versus only 10(4.42%) and 15(6.63%) cases (clear cell carcinoma) in T1 and T2 stage. Pattern of involvement of other subtypes were also observed in some other studies showing tumor stage was significantly associated with histopathology (p< 0.001).They observed clear cell histology, of whom 28% had T3, T4, N or M disease, while patients with papillary and chromophobe varieties, in comparison, had less odds to present with advanced disease (17.6% and 16.9%, respectively).[19] Our findings oppose the results of the above mentioned previous studies as papillary and chromophobe subtypes are also significantly associated with large tumour size or advanced stage with 29(12.83%) and 25 (11.06%) cases of papillary subtype being in T3 and T4 stage versus only 9(3.98%) and 8 (3.54%) in T1 and T2 stages. Similar trends were observed in the chromophobe subtype with 1(0.44%) and 3(1.33%) cases being in T3 and T4 stage and no case in T1 and T2 stage.

Viewing the trends in association of subtype with grade, our studies clearly negate the results of previous studies where they found major link between grade and subtype with 94.7% of clear cell variant were cases that showed grade 3 or 4 tumors compared with only 28.8% and 32.7% of papillary and chromophobe cases, respectively (p <0.001) by finding no significant association between histopathology subtype and grade with p-value of 0.457 (p>0.005) as all the three subtypes showed an equal percentage of high and low grade feature in them and overall both papillary and chromophobe appeared to have shown high grades as 58(25.6%) cases were of high grade papillary (compared to only 13(5.75%) of low grade papillary cases) and 3(1.32%)

cases were high grade chromophobe (vs only 1(0.44%) cases of low garde chromophobe carcinoma.

In an analysis of smoking's association with subtypes in already done studies the USKC (United States Kidney Cancer) investigation denoted that smoking status didn't have any association with any RCC subtypes, although, current smokers were found to be at increased risk for all subtypes but chromophobe RCC which is highly in accordance with our findings of no significant association of smoking with any particular subtype having the p value of 0.351 ($p>0.005$) and an equal incidence of almost any subtype in patients irrespective of their smoking status with least incidence of chromophobe subtype in both smokers and non smokers with 1.36% and 0.44% respectively.[20] As claimed by another study, active smoking happens to be more common with clear cell (23%) or papillary (26%) renal cell carcinoma than chromophobe renal cell carcinoma (6 %) ($p< 0.05$ vs clear cell or papillary). Any coupled history of smoking was comparatively less common with chromophobe (26%) vs clear cell(56% $p=0.003$) or papillary 58% ($p=0.001$) histology.[4] Our study distinctly opposes the findings of this study by having no association of smoking with any particular subtype with smokers and non-smokers both at equal risk of developing the clear cell (32.7% cases in smokers vs 34.07% in non-smokers), papillary (19.02% cases in smokers vs 12.38% in non-smokers) and chromophobe (32% vs 0.44%). Although all three high grade and high staged chromophobe carcinomas are associated with smoking, the number of cases is too low to infer any definitive conclusion.

In another study, active smoking was found to be more common in patients with clear cell RCC and papillary RCC than those with chromophobe RCC.[4] Our findings revealed that chromophobe carcinoma, all three cases were associated with history of smoking. No other specific subtype had any association with smokers as both smokers and non-smokers with comparable occurrence of almost all the subtypes.

Conclusion

Chromophobe carcinoma of kidney is associated with smoking, higher grade and higher stage. We found no significant association of any other specific subtype with gender, smoking and grade of RCC.

References

1. Mills SE. Greenson JR. lornick Jl., Longacre IA, Reuter VE. Sternberg's Diagnostic Pathology. 6th Ed. vol.2. Ch 42. pg 3897-3899, (2015).
2. Alexiev BA, Drachenberg CB. Clear cell papillary renal cell carcinoma: Incidence, morphological features, immunohistochemical profile, and biologic behavior: A single institution study. Pathol Res Pract. 2014 Apr; 210(4):234-41.
3. Williamson SR, Gupta NS, Eble JN, Rogers CG, Michalowski S, Zhang S et al. Clear Cell Renal Cell Carcinoma With Borderline Features of Clear Cell Papillary Renal Cell Carcinoma: Combined Morphologic, Immunohistochemical, and Cytogenetic Analysis. Am J Surg Pathol. 2015 Nov;39(11):1502-10.
4. Patel NH, Attwood KM, Hanzly M, Creighton TT, Mehedint DC, Schwaab T et al. Comparative Analysis of Smoking as a Risk Factor among Renal Cell Carcinoma Histological Subtypes. J Urol. 2015 Sep; 194(3): 640-6.
5. Macher-Göppinger S. Biomarker in Nierenzellkarzinomen. Der Pathologe. 2015 Nov 1;36(2):201-4.
6. Li H, Samawi H, Heng DY. The use of prognostic factors in metastatic renal cell carcinoma. Urol Oncol. 2015 Dec; 33(12):509-16.
7. Shinohara N, Abe T. Prognostic factors and risk classifications for patients with metastatic renal cell carcinoma. Int J Urol. 2015 Oct;22(10):888-97.
8. Moch H. The WHO/ISUP grading system for renal carcinoma. Der Pathologe. 2016 Jul;37(4):355.
9. Renal cell carcinoma: histological classification and correlation with imaging findings. Radiologia brasileira, 48(3), 166–174.
10. SternMC, Lin J, Figueroa JD, et al. Polymorphisms in DNA repair genes, smoking, and bladder cancer risk: findings from the international consortium of bladder cancer. Cancer Res 2009;69:6857–64.
11. Cumberbatch MG, Rota M, Catto JW, La Vecchia C. The Role of Tobacco Smoke in Bladder and Kidney Carcinogenesis: A Comparison of Exposures and Meta-analysis of Incidence and Mortality Risks. Eur Urol. 2016 Sep;70(3):458-66.
12. Howlander N, Noone AM, Krapcho M, SEER cancer statistics review 1975-2016. Natl. Cancer Institute; 2019.
13. Padala SA, Barsouk A, Thandra KC, Saginala K, Mohammed A, Vakiti A, et al. Epidemiology of Renal Cell Carcinoma. World J Oncol. 2020 Jun;11(3):79-87.
14. Pal DK, Maurya AK, Jana D. Comparative study of renal cell carcinoma in patients less than 40 years of age and older age patients: A retrospective single-center study. Indian J Cancer. 2018 Jul-Sep;55(3): 297-

300.

15. Rathore, D. M, Khadim, M, Hassan, U et al. Morphological characterization of renal tumours according to decades of life: experience at afip rawalpindi, pakistan. 2010. Pakistan Armed Forces Medical Journal, 60(3), 338-42.
16. Gurel S, Narra V, Elsayes KM, Siegel CL, Chen ZE, Brown JJ Diagn Interv Radiol. 2013 Jul-Aug; 19(4): 304-11.
17. Sweigert SE, Bajic P, Aragao A, Picken M, Woods ME. Renal Cell Carcinoma with Direct Extension into the Gonadal Vein, Uterus, Fallopian Tube, and Bilateral Ovaries: A Case Report. J Kidney Cancer VHL. 2020 Aug 14;7(3):1-4.
18. Keegan KA, Schupp CW, Chamie K, Hellenthal NJ, Evans CP, Koppie TM. Histopathology of surgically treated renal cell carcinoma: survival differences by subtype and stage. J Urol. 2012 Aug;188(2):391-7.
19. Vincenzo Ficarra, Matteo Brunelli, Liang Cheng, Ziya Kirkali, Antonio Lopez-Beltran, Guido Martignoni, et al. Prognostic and Therapeutic Impact of the Histopathologic Definition of Parenchymal Epithelial Renal Tumors,European Urology, Volume 58, Issue 5, 2010, Pages 655-668.
20. Kroeger N, Klatte T, Birkhäuser FD, Rampersaud EN, Seligson DB, Zomorodian N, et. Smoking negatively impacts renal cell carcinoma overall and cancer-specific survival. Cancer. 2012 Apr 1;118(7):1795-802

Authors Contribution

S.B: Writing of Manuscript

A.R.V: Literature Search

S.M.H: Data Collection

M.F.M: Statistical Analysis

P.R.S: Drafting, Revision.

S.Q: Conceptualization of Project

Patterns of Abnormalities and Yield of Electroencephalograms in Young Adults in a Tertiary Care Medical center in Saudi Arabia

Nasser BenOmran,[1] Abdullah Alubied,[2] Afrah Al Sehali,[3] Abdullah Al Bishi,[4] Hazza Al Otaibi,[5] Emad Masuadi,[6] Ali AlAnazi,[7] Ismail A. Khatri[8]

Abstract

Objectives: To determine the yield of electroencephalograms (EEG) in various clinical scenarios, including epilepsy, in young adults.

Methods: EEGs performed on adults of both genders aged between 18 and 50 years between January 2009 and December 2013 at King Abdulaziz Medical City, Riyadh were included. Clinical indication and EEG findings were determined and correlated.

Results: Of 2,631 EEGs, 1,351 (51.3%) were for females. The mean age was 29.9 ± 9.4 years. A total of 1,928 (73%) EEGs were outpatient. Indications included seizure/epilepsy, status epilepticus, altered level of consciousness, brain death, other indications, and unclear indications. Electroencephalograms were normal in 56.2% of the cases for seizure/epilepsy, 69.3% for altered consciousness, and 65.4% for other indications. When the indication was not clear, 50.6% of EEGs were normal. Epileptiform abnormalities were found in 22.3% of the EEGs for seizure/epilepsy ($p < 0.001$). Slowing with or without epileptiform abnormalities was found in 23.1% of the EEGs for altered consciousness. Electroencephalograms for brain death confirmed diagnosis in 46.7% of the cases ($p < 0.001$). The highest frequency of abnormalities was seen in EEGs performed in the intensive care unit (91.2%), followed by wards (66.3%) and the emergency room (49.4%). Outpatient EEGs were abnormal only in 36.8% of the cases. Overall, 43% of EEGs showed some abnormality.

Conclusion: Electroencephalograms had a higher yield of abnormalities when appropriate clinical questions were asked. The greatest number of confirmatory EEGs was observed in brain death evaluations. Almost half of the EEGs for patients with suspected epilepsy were normal, with only 1 in 5 confirming it. Approximately 2 in 5 EEGs showed some abnormality regardless of the indication.

Key words: Electroencephalogram, abnormal patterns, yield, epileptiform discharges, young adults, Saudi Arabia

How to cite: *BenOmran N., Alubied A., AlSehali A., AlBishi A., AlOtaibi H., Masuadi E., AlAnazi A., Khatri A.I. Patterns of abnormalities and yield of electroencephalograms in young adults in a tertiary care medical center in Saudi Arabia. Esculapio 2021;17(02):121-126.*

DOI: ***https://doi.org/10.51273/esc21.251722***

1. Nasser BenOmran
2. Abdullah Alubied
3. Afrah AlSehali
4. Abdullah AlBishi
5. Hazza AlOtaibi
6. Emad Masuadi
7. Ali AlAnazi
8. Ismail A. Khatri

1. King Saud University, Riyadh, KSA
2 Al-Imam Muhammed Ibn Saud Islamic University, Riyadh, KSA
3 King Saud bin Abdulaziz University for Health Sciences, Riyadh, KSA
4 King Abdulaziz Medical City, Ministry of National Guard Health Affairs, Riyadh, KSA
5 King Abdullah International Medical Research Center, KAIMRC, Riyadh, KSA

Correspondence:
Ismail A. Khatri, *Associate Professor of Neurology King Saud bin Abdulaziz University for Health Sciences. Riyadh Division of Neurology, Department of Medicine. Email: ismailkhatri@yahoo.com*

Submission Date: 24-05-2021
1st Revision Date: 29-05-2021
Acceptance Date: 03-06-2021

Introduction

Electroencephalography (EEG) is a complementary tool used to support the diagnosis of epilepsy and evaluate other neurological conditions, such as psychogenic nonepileptic seizures and encephalopathies. Some special conditions that can be diagnosed with a certain degree of confidence using EEG include Creutzfeldt-Jakob disease and subacute sclerosing panencephalitis (SSPE).[1] Routine EEG has some limitations, which are not widely recognized; consequently, it has been used suboptimally in clinical practice.[1] Several studies have shown that a large proportion of EEG requests could be inappropriate due to the prevalent misconcep-

tion about its diagnostic capabilities.[1,2] The literature indicates that overinterpretation of EEG results can lead to misdiagnosis and unnecessary treatment when used for diagnostic confirmation by non-specialized physicians.[3]

Limited data is available about the diagnostic yield of routine EEGs in general, particularly in young adults. Few studies have investigated the sensitivity and specificity of routine EEGs performed for epilepsy. The yield of a single EEG for epilepsy could be up to 50%, which increases with repeated EEGs up to 80%.[3] A recent study found that pre-test diagnosis of epilepsy, a young patient age, and not using antiepileptic medications increased the yield of routine EEGs.[4] Electroencephalograms requested for syncope usually have very low yield and hardly ever alter the management decisions.[5,6] In this study, we aimed to determine the yield of EEGs when ordered for conditions other than epilepsy. We also tried to determine the EEG yield when the clinical question was epilepsy or status epilepticus. In this paper, we present the results of various indications and their respective patterns of electroencephalographic abnormalities in young adults.

Methods

We conducted a cross-sectional chart review at King Abdulaziz Medical City, MNGHA, Riyadh for EEGs performed from January 2009 until December 2013. The study was approved by King Abdullah International Research Center (KAIMRC) institutional review board. Young adults of both genders were included. We arbitrarily defined young adults as people aged from 18 to 50 years at the time of EEG. We set an upper limit of 50 years because many EEG abnormalities in people older than that are considered nonspecific and age-related.[7] Patients with missing data regarding the interpretation were excluded. The patients' demographic information, clinical indications or questions for EEG, the EEG settings, and patterns of EEG abnormalities were recorded. The data was analyzed using SPSS version 23.0. Categorical data is presented as frequencies and percentages, while continuous data is presented as mean with standard deviations.

The EEGs were performed using a Compumedics digital EEG acquisition system (Compumedics Ltd., Melbourne, Australia) with scalp electrodes placed using the international 10-20 system. The EEG settings were categorized into outpatient clinics and inpatient settings, subcategorized as wards, emergency room (ER), and intensive care units (ICU). The indications for EEG were categorized into epilepsy/seizure, status epilepticus, altered level of consciousness, brain death, other indications (for example, syncope, vertigo, or unexplained fall), and unclear indications. All EEG reports were reviewed, and the results were classified as normal, epileptiform activity (focal or generalized), slowing (focal or generalized), electrocerebral silence (brain death), and borderline/nonconclusive. In many patients there were more than one abnormal finding. Normal variants were included in the normal EEG category. A chi-square test was used to determine statistically significant relationships between variables.

Results

A total of 2,631 EEGs were included based on the inclusion criteria. Of those, 1,351 (51.3%) were performed on females. The patients' mean age was 30.0 ± 9.4 years, with a mean age of 29.4 for males and of 30.5 for females. The EEG settings included outpatient and inpatient settings, with a small number of undetermined settings **(Figure 1)**. The distribution of EEGs according to patient setting is shown in **Figure 2**.

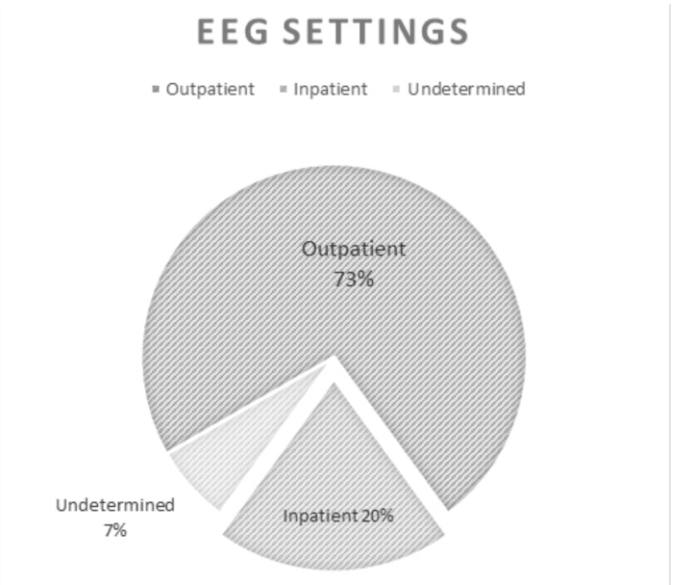


Figure 1 - *Distribution of EEGs According to Clinical Setting*

The indications for the EEGs were categorized as follows: seizure/epilepsy: 2,092 (79.5%); status epilepticus: 26 (1%); altered level of consciousness: 225 (8.6%); brain death: 15 (0.6%); other indications: 188 (7.1%); and unclear indications: 85 (3.2%).

The EEG findings were categorized as follows: norma

Table 1: *EEG Findings in Relation to Various Clinical Questions/Indications*

Indication for EEG		EEG Finding					
		Normal	Brain dead	Slowing*	Epileptiform*	Borderline /nonconclusive*	Total
Seizure/Epilepsy	n	1,175	0	515	467	249	2,092
	%	56.2%	0%	24.6%	22.3%	11.9%	
Status epilepticus	n	2	0	17	12	4	26
	%	7.7%	0%	65.4%	46.2%	15.4%	
Altered level of consciousness	n	156	0	38	26	29	225
	%	69.3%	0%	16.9%	11.6%	12.9%	
Brain death	n	0	7	3	1	5	15
	%	0%	46.7%	20%	6.7%	33.3%	
Other	n	123	0	45	23	13	188
	%	65.4%	0%	23.9%	12.2%	6.9%	
Not clear	n	43	0	29	12	13	85
	%	50.6%	0%	34.1%	14.1%	15.3%	

* Some EEGs showed more than one type of abnormality and are reported as separate findings.

l: 1,499 (57%); slowing: 647 (24.6%; focal: 326 [12.4%], generalized: 377 [14.3%]); electrocerebral silence: 7 (0.3%); borderline/nonconclusive: 313 (11.9%); epileptiform: 541 (20.6%; focal: 395 [15%], generalized: 180 [6.8%]). **Table 1** shows the relationship between various indications for EEG and the corresponding findings. The relationship between EEG findings and the EEG settings is shown in **Table 2**. Some patients exhibited more than one type of abnormality in the same EEG and are reported as separate findings.

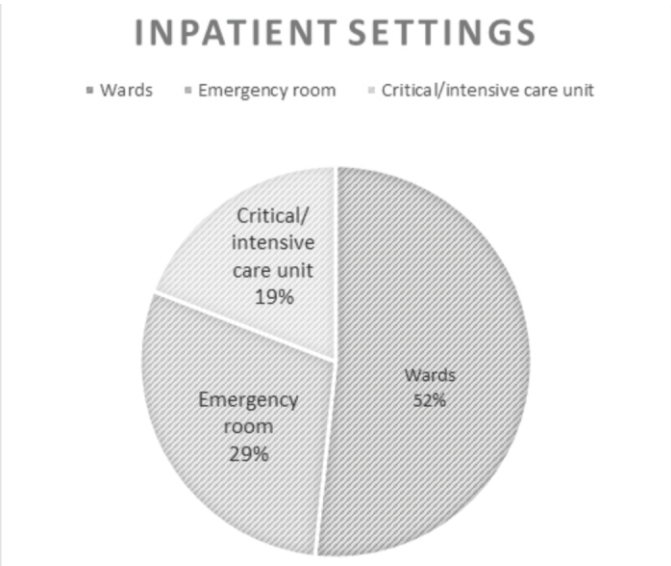


Figure 2 - *Distribution of Inpatient EEGs According to Setting*

Approximately three-quarters of the EEGs in our cohort were performed in outpatient settings, whereas one-fifths were performed in inpatient settings. For the remaining, the exact setting could not be determined retrospectively. Among the inpatient EEGs, 52% were performed in wards, 29% in the emergency room, and 19% in critical/intensive care units. Almost 9 out of 10 (91.2%) EEGs performed in an ICU setting showed some kind of abnormality. Generalized slowing was noted in 61.8% of all ICU EEGs, epileptiform abnormalities were seen in 15.7% of the cases, and electrocerebral silence was seen in 5% of the EEGs.

Table 2: *EEG Findings in Relation to Settings*

Finding		Setting				
		Out-patient	Wards	ICU	ER	Undeter-mined
Normal	n	1,218	92	9	78	102
	%	63.2%	33.7%	8.8%	50.7%	58.6%
Brain death	n	0	1	6	0	0
	%	0%	0.4%	5.9%	0%	0%
Slowing	n	360	132	69	44	42
	%	18.7%	48.4%	67.7%	28.6%	24.1%
Epileptiform	n	402	59	16	32	32
	%	20.9%	21.6%	15.7%	20.8%	18.4%
Borderline/ nonconclusive	n	208	49	19	20	17
	%	10.8%	18.0%	18.6%	13.0%	9.8%

ICU - intensive care unit, ER - emergency room.

Table 3: *EEG Requests According to Gender*

Indication	Gender				
	Male (n = 1,280)		Female (n = 1,351)		
	n	%	n	%	p-value
Seizure/Epilepsy	1,024	80%	1,068	79.1%	0.547
Status epilepticus	20	1.6%	6	0.4%	0.004
Altered level of consciousness	75	5.9%	150	11.1%	<0.001
Brain death	14	1.1%	1	0.1%	0.001
Other	100	7.8%	88	6.5%	0.196
Not clear	47	3.7%	38	2.8%	0.213

The gender differences between the number of EEGs requested for various indications are shown in Table 3. Male patients had significantly more requests for status epilepticus and brain death, while females had more requests for altered level of consciousness.

The highest abnormality frequencies were seen in EEGs performed in ICUs (91.2%), followed by wards (66.3%) and the emergency room (49.4%). The outpatient EEGs were abnormal only in 36.8% of the cases. Overall, 43% of the EEGs showed some abnormality. EEGs requested for brain death confirmed diagnosis in 46.7% ($p < 0.001$), while none of the EEGs performed for status epilepticus confirmed it.

When analyzing the sensitivity and specificity of clinical suspicion of seizures/epilepsy, we found that EEG was sensitive in 22.3% of the suspected seizure/epilepsy cases and specific in 87.9%.

Discussion

Although many different pathological processes disturb brain function, the EEG abnormality findings are limited. Moreover, despite reliably indicating brain dysfunction, EEG rarely distinguishes between abnormality etiology and pathology.[8] It has been shown to have greater potential and to be of more crucial value when trying to answer specific, clearly defined questions.[9]

In the field of electroencephalography, it is known that certain findings seen in patients of older age may easily be misinterpreted as abnormalities. As many as 52% of EEGs in asymptomatic elderly people can be considered abnormal when compared to healthy young adults due to normal variants, EEG artifacts, and other factors.[7] In our study, we arbitrarily defined young adults as people aged between 18 and 50 years to avoid potential misinterpretation of the findings. We considered the age of 50 as our upper limit because the Saudi population is still a young population with a current life expectancy of 74 years.[10]

Electroencephalograms are commonly used for the evaluation of patients with suspected epilepsy. However, they have also been used for a variety of other conditions and indications. Head trauma, encephalitis, and memory impairment are some of the common indications. In our study, an EEG was requested for epilepsy or suspected seizures in 79.5% of the cases. In addition to altered level of consciousness, suspected brain death, and suspected status epilepticus, a number of EEGs were requested for other conditions, such as vertigo, dizziness, migraine, hallucinations, abnormal behavior, memory impairment, and postural imbalance.

Electroencephalograms can show nonspecific abnormalities in a number of conditions, such as dementia, migraine, and psychotic illnesses.[8] Even epileptiform abnormalities can be seen in patients who have never suffered from unprovoked seizures or epilepsy.[8] Electroencephalogram abnormalities should always be interpreted in a clinical context and considered supportive evidence.[2] In our series, a little less than half of all EEGs showed some kind of abnormality regardless of the indication. Epileptiform abnormalities were found in almost one-fifth of all EEGs. When the clinical question was epilepsy/seizure, epileptiform abnormalities were found in little more than 20% of the cases, while more than half of all EEGs performed for epilepsy were normal. The rest of the EEGs for epilepsy/seizure showed nonspecific slowing or were nonconclusive/borderline. This is consistent with previous studies, where the sensitivity of the first EEG for epilepsy was reported to be between 17% and 29%.[11,12]

The yield of outpatient EEGs is generally considered low, particularly when the pre-test diagnosis is not clear or is other than epilepsy/seizure. Epilepsy or suspected seizure was the reason for requesting 82.3% of all outpatient EEGs. As expected, majority of all outpatient EEGs were normal, while 20.9% showed epileptiform abnormalities (7.2% generalized and 14.9% focal). A recent study assessing the yield of routine EEGs in an outpatient setting reported similar results, with normal EEGs accounting for 66.7% and epileptiform abnormalities accounting for 13.2% (6.2% generalized and 7% focal).[4]

None of the EEGs performed for the question of brain death was normal. Although very few EEGs for status epilepticus were normal, all the abnormal EEGs showed epileptiform discharges or slowing, but none confirmed electrographic status epilepticus. This could be related to the possibility that EEGs were performed after initiating treatment based on clinical suspicion or to the possibility that the actual cause of unconsciousness was other than nonconvulsive status epilepticus. When EEGs were performed without clearly stated or with nonspecific indications, we still found that 12–14% showed epileptiform activity. This is more than the expected rate for the general population, which has been reported to be around 2.2%.[13] Possible explanations could be that the history was not appropriately recorded by the requesting physician, or that it was for epilepsy/

seizures, but the requesting physician did not mention it. We found that when the clinical pre-test probability was high, as in cases of brain death evaluation, the yield of EEG was high, whereas it was very low when it was for altered level of consciousness, unclear indications, or other indications. Previous reports also found a positive correlation between routine EEG and pre-test diagnosis/indication.[4]

Regarding specific abnormalities based on clinical questions or indications, the EEGs were found abnormal in 22.3% of all cases for epilepsy/seizure. Electrocerebral silence was noted in 46.7% of all EEGs requested for suspected brain death. Slowing or epileptiform activity was found in 23.1% of patients with an altered level of consciousness. A total of 34.6% of the EEGs performed for other indications showed abnormal findings. Among the EEGs with unclear indications, 47.7% were abnormal with nonspecific abnormalities, including epileptiform activity.

There was a male preponderance in EEGs performed for brain death and status epilepticus, whereas EEGs for altered level of consciousness were more frequently performed on females. Traumatic brain injury is one the most common causes of brain death.[14] As our center is a trauma center, it is possible that this male preponderance of EEGs for brain death is related to traumatic brain injuries common among male Saudi motor vehicle drivers, as until recently driving was a male prerogative in Saudi Arabia. Psychogenic nonepileptic events are more common in women and manifest in a variety of semiologies.[15] The higher frequency of EEGs for altered level of consciousness in females can possibly be explained by a great number of symptoms of nonepileptic events.

The yield of EEG varies depending on the setting, the experience or specialty of the ordering physician, and the indication or pre-test probability.[4,6] In our study, we found a higher yield in EEGs performed in ICUs, inpatient/ward settings, or the ER compared to outpatient EEGs. Only 8.8% of the ICU EEGs were normal, while 67.6% showed nonspecific slowing, and 15.7% showed epileptiform abnormalities. A recent study in an adult ICU in Saudi Arabia showed epileptiform abnormalities in 18.4% of the cases.[16]

Our study had a number of limitations. A major limitation was the retrospective study design. We had to rely on information documented in the medical records, which were not adequately detailed in some cases. We could not always identify the experience and specialty of the ordering physician; hence, we could not correlate it to the yield. The pre-test probable diagnosis was not confirmed by any gold standard, and we assumed the clinical suspicion to be the appropriate diagnosis. There was no radiological correlation to ascertain the etiology and the abnormality patterns. The indication was unclear or nonspecific in almost 1 out of every 10 EEGs. As this was a single-center study, the findings may not be generalizable to the entire country.

Conclusions

The yield of EEGs performed on young adults for indications other than epilepsy is low. A large number of EEGs performed for suspected epilepsy/seizure, as well as for altered consciousness and nonspecific indications are normal. The confirmatory or diagnostic abnormalities are few and are affected by the pre-test diagnosis or clinical suspicion.

Clinicians should be aware of the limitations of EEG. Pre-test diagnosis or specific clinical questions should be included in the EEG requests to improve the yield and avoid incidental findings, which may adversely affect patient management. Electroencephalography should not be considered an isolated diagnostic tool; rather, its findings should be clinically correlated and integrated into the entire clinical scenario.

Conflict of Interest and Disclosures

None of the authors had any disclosures for this study. There was no special funding for this study.

References

1. Smith D, Bartolo R, Pickles RM, Tedman BM. Requests for electroencephalography in a district general hospital: retrospective and prospective audit. BMJ 2001; 322: 954-957.
2. O'Toole O, Lefter S, McNamara B. EEG use in a tertiary referral center. Ir Med J 2011; 104: 202-204.
3. Benbadis SR, Lin K. Errors in EEG interpretation and misdiagnosis of epilepsy. Which EEG patterns are overread? Eur Neurol 2008; 59: 267-271.
4. Monif M, Seneviratne U. Clinical factors associated with the yield of routine outpatient scalp electroencephalograms: a retrospective analysis from a tertiary hospital. J Clin Neurosci 2017; 45: 110-114.
5. Abubakr A, Wambacq I. The diagnostic value of EEGs in patients with syncope. Epilepsy Behav 2005; 6: 433-434.
6. Poliquin-Lasnier L, Moore FG. EEG in suspected syncope: do EEGs ordered by neurologists give a

higher yield? Can J Neurol Sci 2009; 36: 769-773.
7. Davidson PN, Davidson KA. Electroencephalography in the elderly. Neurodiagn J 2012; 52: 3-19.
8. Duncan H, Spillane K, Morrison I. Electroencephalography – an overview. Scottish Universities Medical Journal 2014; 3: 47-53.
9. Binnie CD, Stefan H. Modern electroencephalography: its role in epilepsy management. Clin Neurophysiol 1999; 110: 1671-1697.
10. Bah S. How feasible is the life expectancy target in the Saudi Arabian vision for 2030? East Mediterr Health J 2018; 24: 401-404.
11. Bouma HK, Labos C, Gore GC, Wolfson C, Keezer MR. The diagnostic accuracy of routine electroencephalography after a first unprovoked seizure. Eur J Neurol 2016; 23: 455-463.
12. Salinsky M, Kanter R, Dasheiff RM. Effectiveness of multiple EEGs in supporting the diagnosis of epilepsy: an operational curve. Epilepsia 1987; 28: 331-334.
13. Zivin L, Marsan CA. Incidence and prognostic significance of "epileptiform" activity in the EEG of nonepileptic subjects. Brain 1968; 91: 751-778.
14. Drake M, Bernard A, Hessel E. Brain death. Surg Clin North Am 2017; 97: 1255-1273.
15. Korucuk M, Gazioglu S, Yildirim A, Karaguzel EO, Velioglu SK. Semiological characteristics of patients with psychogenic nonepileptic seizures: gender-related differences. Epilepsy Behav 2018; 89: 130-134.
16. Fallatah A, Sahly A, Talukder AM, Alansari Y, Zahid H, Fadel E, et al. The yield of routine electroencephalography in the adult ICU: experience from a tertiary hospital in Saudi Arabia. Imperial Journal of Interdisciplinary Research 2017; 3: 759-762.

Authors Contribution

N.B.O: Conceptualization of Project/Data CoIlection/Literature Search/Writing of Manuscript

A.A: Conceptualization of Project/Data Co1lection/ Literature Search/Writing of Manuscript

A.A.S: Conceptualization of Project/Data Collection/Literature Search/Writing of Manuscript

A.A.B: Data Collection/Revision/Approval of Manuscript H.AIOt.: Data Collection/Revision/Approval of Manuscript

E.M: Data Analysis/Writing of Manuscript/ Approval of Manuscript

A.A.A: Conceptualization of Project/Data Analysis/ Literature Search/Writing of Manuscript

I.A.K: Conceptualization of Project/Data Analysis/ Literature Search/Writing of Manuscript

Assessment of Geriatric Depression through GDS-SF Scale in Residents of Old Age Homes of Lahore, Pakistan

Iram Manzoor,[1] Tanzeela Zafar,[2] Noor ul Ain Liaqat,[3] Rameen,[4] Sajjad Anwar[5]

Abstract

Objective: The objective of this research was to find out the prevalence of depression and associated factors among geriatric population living in elderly homes in Lahore Pakistan.

Methods: An analytical cross-sectional study was carried out from 1st March - 30th August 2019 among residents of five different old age care homes in Lahore. A sample of 133 inhabitants, both males and females were included using non-probability, purposive sampling technique. After getting IRB approval and informed consent from the participants, data was collected via pre-designed questionnaire using Geriatric Depression Scale through interview technique. Data was analyzed via SPSS version 22 and was presented in form of frequency tables. Chi-square test was applied and p-value was fixed at ≤ 0.05 to declare results significant.

Results: The mean age of inhabitants was 70.36 years ± 8.61. Majority of them, 70 (52.6%), were males and 48 (33.83%) were widowed. Of the studied, 47 (35.3%) inhabitants were diabetic and 40 (30.0%) were hypertensive. Based upon GDS-SF scoring almost 1/3rd i.e 50 (37.6%) participants were categorized to had mild depression while 19 (14.7%) and 18 (13.5 %) had moderate depression and severe depression respectively. Significant difference was observed in memory loss among female participants (p= 0.001).

Conclusion: Depression was common among residents of old age care homes, where 65.71% of the male residents and 65.07% of the females were depressed. The major themes related to cause of depression were dissatisfaction with life, staying indoor and memory problems.

Keywords: Depression, Geriatric population, Elderly homes

How to cite: *Manzoor I., Zafar T., Liaqat A.ul N., Rameen., Anwar S. Assessment of geriatric depression through GDS-SF scale in residents of old age homes of Lahore, Pakistan. Esculapio 2021;17(02):127-131.*

DOI: ***https://doi.org/10.51273/esc21.251723***

Introduction

Alterations in lifestyle and the ever-changing society standards has led to increased incidence of admitting the elderly into care homes.[1] The percentage of population above 65 years of age varies considerably in developing and in developed countries like in the United States it is around 15.41% of the total population, while in India, Iran and Afghanistan, the proportion is 5.99%, 5.44% and 2.58% respectively.[2] In Pakistan, the geriatric population above 65 years is around 5.6%.[3] Studies have shown that the elderly living in old age homes show more symptoms of depression, anxiety and other psychiatric symptoms than those living with their own families.[4]

Community-based mental health studies have revealed that the prevalence of depressive disorders in the elderly population of the world varies between 10% and 20%, depending on cultural situations.[5] The percentage of depression in elderly Caucasians admitted in old age care homes ranges from 14-42%.[6] A study conducted in Norway has shown surprisingly high prevalence i.e 56.8%. In Iran, the prevalence of depression in geriatric population varies between 33-41%. In Nepal, a study showed that 47.33% of the population in care homes suffers from depressive symptoms.[7] Depression among people living in old age homes in India varies from

1. Iram Manzoor
2. Tanzeela Zafar
3. Noor ul Ain Liaqat
4. Rameen
5. Sajjad Anwar

1-5. Community Medicine, , Akhtar Saeed Medical and Dental College (AMDC), Lahore

Correspondence:
Dr. Iram Manzoor, Professor & HOD (Community Medicine), Director Medical Education, Akhtar Saeed Medical and Dental College (AMDC), Lahore. E-mail: iramdr123@yahoo.co.in

Submission Date: 20-04-2021
1st Revision Date: 27-04-2021
Acceptance Date: 20-05-2021

mild (29%), moderate (48%) and severe (14%). However, in comparison to above statistics, the prevalence of depression in geriatric population of Pakistan is much less. In a study conducted in Pakistan with a sample size of 60 people, 5.87% of them showed symptoms of depression, and 6.25% showed symptoms of anxiety.[8]

According to World Health Organization approximately 15% of geriatric population suffers from mental disorder worldwide.[9] Contributing to this depression are various socio-demographic factors like the level of care provided by the old homes, social support, the age, educational status of the person, the gender and the duration of stay in the old age home, along with other physical diseases and disabilities.[10]

The rationale of this study is to find the prevalence of depression among old home residents in Pakistani context along with the causative factors so that measures can be taken to remove these factors to a possible limit to minimize depression, anxiety and stress. The objective of this research was to find out the prevalence of depression and associated factors among geriatric population living in elderly home.

Methods

An analytical cross-sectional study was carried out from 1st March to 30th August 2019 among residents of old age homes in Lahore. There are eight old age care homes in Lahore, out of which five were select randomly which included namely Old-age Happy Homes, Heaven for Senior Citizens, Edhi-homes, Darul Kafala and Afiyat Old-ages Homes. After taking permission from institutional review board of Akhtar Saeed Medical & Dental College for conduction of research with IRB approval number M-18/026/CM, permission was sought from heads of the institution mentioned above to access the residence and conduction of interviews. After taking permission for data collection for this study the inhabitants were approached for informed written consent. A sample of 133 inhabitants, both males and females were included using non-probability, purposive sampling technique. Residents that were mentally handicapped or those who didn't give consent were excluded. Data was collected via pre-designed questionnaire using Geriatric Depression Scale, short form (GDS-SF) through interview technique. This scale was first developed in 1982 by J.A Yesavage and its a reliable and valid self-rating depression screening scale for elderly population. The tool was translated in local language and was validated through pilot study. The calculated Crown Bach alpha was 0.73 making it a highly valid and reliable tool. Socio-demographic variables like age, education, marital and employment status, time spent at old age home, etc were included in the tool. Later the data was coded, entered and analyzed via SPSS (statistical package for social sciences) version 22. Results were presented in form of frequency tables for univariate analysis. For bivariate analysis chi-square test was applied keeping p-value of <0.05 as significant

Results

A total of 133 residents from five different old age care homes, in Lahore, were included. The mean age of inhabitants was 70.36 years ± 8.61. Majority of them, 70 (52.6%), were males and Lahore was hometown for 69(51.87%) of participants. Of the sample studied, 69 (51.87%) were married and 48 (33.83%) were widowed. Out of total 133 participants, only 33 (24.81%) were graduates. Out of total, 43 (32.3%) had no children. The mean number of children of these inhabitants was 3.09 and +3.634 and only 40 (30%) were employed. **(Table 1)**

Out of total 133 participants, 47 (35.3%) inhabitants were diabetic and 40 (30.0%) were hypertensive. More than 2/3rd of the participants, 105 (78.9%), reported to have normal appetite while 44 (33.1%) gave history that they lost weight in the past few months. **(Table 2)**

Table 1: *Socio Demographic Profile of Geriatric Population*

Variable	Frequency (n= 133)	Percentage (%)
Gender Distribution		
Male	70	52.6%
Female	63	47.4%
Hometown		
Lahore	69	51.87 %
Out of Lahore	64	48.12 %
Marital Status		
Married	69	51.87 %
Unmarried	9	6.76 %
Divorced	10	7.51 %
Education		
Illiterate	25	18.79 %
Primary	18	13.53 %
Matric	39	29.32 %
Intermediate	18	13.53 %
Graduate	33	24.81 %
Employment Status		
Employed	40	30.0 %
Unemployed	93	70.0 %

After application of GDS-SF Geriatric Depression Scale, short form, geriatric population was labeled as normal with the score of 0-4, with mild depression with the score of 5-8, with moderate depression 8-11, with severe depression 12-15. Of the studied, 50 (37.6%) were normal with no signs and symptoms of anxiety and depression. 46 (34.6%) had mild depression while 19 (14.7%) had moderate depression. A slight percentage above 13% was found to had severe depression. There was no gender difference observed in degrees of depression (p= 0.943). **(Table 3)**

Further analysis of the data showed that there was no gender difference in satisfaction level with life among the participants (p= 0.628). However majority of the female reported that they felt happy most of the time in their lives (p= 0.049). Significant difference was observed between two genders when it comes to their memory problems among the participants (p=0.001). **(Table 4)**

Table 3: *Physical Health Profile of Participants*

Variable	Frequency (n=133)	Percentage (%)
Prevalence of chronic diseases		
Diabetes	47	35.3 %
Hypertension	40	30.0 %
COPD	4	3.0 %
Joint Pain	14	10.5 %
None	28	21.0 %
Normal appetite		
Yes	105	78.9 %
No	28	21.1 %
Loss of weight in the past few months		
Yes	44	33.1 %
No	89	66.9 %

Table 4: *Symptomatic Presentation according to GDS-SF Scale for Participants of Geriatric Population in Lahore*

Variable	Male	Female	p-value
Satisfied with life	54	50	0.628
Not satisfied with life	16	13	
Drop in activities	39	33	0.700
No Drop in activities	31	30	
Feeling of emptiness	33	30	0.571
No Feeling of emptiness	37	33	
Constant feeling of boredom	42	35	0.575
No Constant feeling of boredom	28	28	
Good spirits most of the time	45	44	0.498*
No Good spirits most of the time	25	19	
Fear of something bad going to happen	17	16	0.882
No Fear of something bad going to happen	53	47	
Feeling of happiness	33	40	0.049
No feeling of happiness	37	23	
Memory problems	22	38	0.001**
No Memory problems	48	25	
Feeling of helplessness	28	23	0.679
No Feeling of helplessness	42	40	
Feeling wonderful of being alive	50	43	0.413
No Feeling wonderful of being alive	20	20	
Intent of staying indoors	38	35	0.883
No Intent of staying indoors	32	28	
Feeling of being full of energy	36	29	0.534
No Feeling of being full of energy	34	34	
Feeling of worthlessness	23	25	0.413
No Feeling of worthlessness	47	38	
Feeling of hopelessness	21	19	0.984
No Feeling of hopelessness	49	44	
Feeling of being better off than most	29	24	0.695
No Feeling of being better off than most	41	39	

Table 3: *Gender difference in Degrees of Depression Among Geriatric Population*

	Variable						
Total score	**Normal**	**Mild depression**	**Moderate depression**	**Severe depression**	**Frequency (n=133)**	**Percentage (%)**	**p-value**
Males	26	24	11	9	70	52.6 %	0.943
Females	24	22	8	9	63	47.3 %	
Total	50	46	19	18	133	100%	

Discussion

According to the study conducted, the mean age of the residents of old age homes of Lahore was 70.36 (SD±8.61). In a study conducted in America in 2011, the mean age in old age homes was found to be 82.3 (SD±7.4).[11] This shows that in developed countries, the mean age of old age homes residents is more as compared to developing countries. A study conducted in Hyderabad, India, found the mean age of the old age care homes inhabitants to be 67.4 (SD±4.7), with most of the residents in the age group 66-70 years (61%), which is in accordance with the findings in our study.[12]

There were more males residing in the old age homes, 70(52.6%), as compared to females. However, a study conducted in Kathmandu, Nepal, had contrast finding i.e most of the inmates of old age care homes were females (56.34%) compared to males (43.66%).[13]

Majority of the participants, 100 (57.5%), in this study were widowed. This finding is also reflected in a study conducted in Tehran, Iran, which showed that majority of the participants of that study were widowers (68%).[9].

Out of the sample studied, matriculation was the highest education level of 39 (29.32%) of participants while only 33 (24.81%) were graduates in different subjects. This finding is in contrast to a study conducted in Lucknow, which showed that most of the inmates of the old age care homes were illiterate, 13 (28.9%).[14]

Out of the studied sample, 105 (78.9%) had normal appetite, while 44 (33.1%) had experienced weight loss in the past few months. However, this anorexic state among residents can be attributed to many factors like changes in taste, hyposmia, difficulty in chewing due to loss of teeth, gastro-esophageal reflux disease, reduction in gastric and pancreatic enzyme secretions, increased leptin levels and finally, a major cause can be depression.[15]

Regarding life satisfaction, no gender difference was observed among the inmates (p 0.628). This finding is in contrast to a study conducted among 593 residents of old age care home in Pennsylvania i.e women were more satisfied with their lives compared to men.[16] In support of this, when the habitants of the old age homes were asked about their leisure time activities, 72 (54.1%) said that they had dropped many of their hobbies and other social activities. Similarly, most of the inmates of the old age homes, 73 (54.9%), preferred to stay indoors rather than going out and getting involved in social and recreational activities. This implies that most of the inhabitants did not enjoy any company, which is an indicator of depression in which the person prefers to stay in his own company and away from social situations. A study conducted in China states that leisure and recreational activities serve as a buffer for depression.[17]

Regarding cognitive abilities, memory problems were more prevalent among females as compared to males (p 0.001). However data of a cross-sectional study conducted on 188 Swedish nursing homes showed that male and female inmates suffered equally from memory impairment.[18]

According to current research, no gender difference was observed regarding the prevalence of depression among male and female participants (p 0.943). However a research conducted at United States, including 11,788 participants showed that women suffered more from depressive disorders compared to males.[19]

This suggests that most of the inmates of old age homes suffer from depression, whether mild, severe or in-between. This simply could be because of the effects of old age, lack of energy due to old age, separation from loved ones, death of a spouse or feeling of being neglected by their siblings and their family. No one wants to be alone or to live in a house full of strangers with different levels of understanding, especially away from their loved ones. All these feelings of worthlessness, hopelessness, abandonment and neglect, ultimately amalgamate into many physical and psychological effects, one of them being depression.

Conclusion

Depression was common among residents of old age care homes, where 65.71% of the male residents and 65.07% of the females were depressed. The major themes related to cause of depression were satisfaction with life, staying indoor, drop in routine life activities and memory problems.

Acknowledgements/ disclaimer/ conflict of interest

We would like to thank following organizations for their allowance of access and data collection of geriatric population residing there. We are thankful to Old Age Happy homes, Heaven for Senior Citizens, Darul Kafala and Affiyat old home.

The authors declare no potential conflicts of interest with respect to research, authorship or publication.

Ethical Standards

This study was conducted after Institutional review board approval of AMDC through IRB certificate number M-18/026/CM on 30/3/2019. After IRB approval, permissions were sought from five mentioned geriatric homes. After approval of entry and getting access to population, each participant was informed about objective of study. Written informed consent was taken from each participant with a promise to keep confidentiality and anonymity of participants in mind.

References

1. Dhara DR, Jogsan YA. Depression and psychological well-being in old age. J PSYCHOL PSYCHOT 2013;

3 (3): 1-4. doi: 10.4172/2161-0487.1000117.

2. Tiwari SC, Pandey NM, Singh I. Mental health problems among inhabitants of old age homes: A preliminary study. Indian J Psychiatry 2012; 54 (2): 144-148. doi: 10.4103/0019-5545.99533.
3. Jalal S, Younis MZ. Aging and elderly in Pakistan. Ageing Int 2014; 39 (1): 4-12.
4. Karakaya MG, Bilgin SÇ, Ekici G, Köse N, Otman AS. Functional mobility, depressive symptoms, level of independence, and quality of life of the elderly living at home and in the nursing home. J Am Med Dir Assoc 2009; 10 (9): 662-6. https://doi.org/10.1016/ j.jamda. 2009.06.002.
5. Barua A, Ghosh MK, Kar N, Basilio MA. Prevalence of depressive disorders in the elderly. Ann Saudi Med 2011; 31 (6): 620-4. doi: 10.4103/0256-4947.87100.
6. Djernes JK. Prevalence and predictors of depression in populations of elderly: a review. Acta Psychiatr Scand 2006; 113 (5): 372-87. https://doi.org/10.1111/ j.1600-0447.2006.00770.x .
7. Erdal A, Flo E, Selbaek G, Aarsland D, Bergh S et al. Associations between pain and depression in nursing home patients at different stages of dementia. J Affect Disord 2017; 218: 8-14. https://doi.org/10.1016/ j.jad. 2017.04.038.
8. Parshad N, Tufail A. Depression, Anxiety, Coping And Quality of life among Elderly living in Old Age Homes and in Family Set up. Pak J Prof Psychol 2014; 5 (1): 1-11.
9. https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults.
10. Takai Y, Yamamoto-Mitani N, Okamoto Y, Koyama K, Honda A. Literature review of pain prevalence among older residents of nursing homes. Pain Manag Nurs 2010; 11 (4): 209-23. https://doi.org/10.1016/ j.pmn. 2010.08.006.
11. Kaiser MJ, Bauer JM, Uter W, Donini LM, Stange I et al. Prospective validation of the modified mini nutritional assessment short forms in the community, nursing home, and rehabilitation setting. J Am Geriatr Soc 2011; 59 (11): 2124-8. https://doi.org/10.1111/ j.1532-5415. 2011.03659.x.
12. Maktha S, Kumar MV. Study on level of depression among elderly residing in an old age home in Hyderabad, Telangana. Int J Indian Psychol 2015; 3 (1): 12-7.
13. Ranjan S, Bhattarai A, Dutta M. Prevalence of depression among elderly people living in old age home in the capital city Kathmandu. Health Renaissance 2013; 11 (3): 213-8. https://doi.org/10.3126/ hren.v11i3.9634.
14. Akbar S, Tiwari SC, Tripathi RK, Kumar A, Pandey NM. Reasons for Living of Elderly to In Old Age Homes: An Exploratory Study. Int J Indian Psychol 2014; 2 (1): 56-61.
15. Martone A, Onder G, Vetrano D, Ortolani E, Tosato M et al. Anorexia of aging: a modifiable risk factor for frailty. Nutrients 2013; 5 (10): 4126-33. https://doi.org/10.3390/nu5104126.
16. Resnick B, Boltz M, Galik E, Holmes S, Fix S et al. Gender differences in function, physical activity, falls, medication use, and life satisfaction among residents in assisted living settings. Research Gerontol Nurs. 2020;13 (1): 31-40. https://doi.org/10.3928/ 19404921-20190930 -02.
17. Ouyang Z, Chong AM, Ng TK, Liu S. Leisure, functional disability and depression among older Chinese living in residential care homes. Aging Ment Health 2015;19(8):723-30.https://doi.org/10.1080/13607863.2014.962009.
18. Björk S, Juthberg C, Lindkvist M, Wimo A, Sandman PO et al. Exploring the prevalence and variance of cognitive impairment, pain, neuropsychiatric symptoms and ADL dependency among persons living in nursing homes; a cross-sectional study. BMC Geriatr 2016; 16 (1): 1-8.
19. Moore KL, Boscardin WJ, Steinman MA, Schwartz JB. Age and Sex Variation in Prevalence of Chronic Medical Conditions in Older Residents of US. Nursing Homes. J Am Geriatr Soc 2012; 60 (4): 756-64. https://doi.org/10.1111/j.1532-5415.2012.03909.x

Authors Contribution

I.M: Conceptualization of Project
T.Z, S.A: Data Collection
N.U.A.L, S.A, R: Literature Search
I.M, S.A: Statistical Analysis
I.A, T.Z: Drafting, Revision,
T.Z, N.U.A.L, S.A, R: Writing of Manuscript

Effectiveness of Intrauterine Balloon Tamponade in the Control of PPH due to Uterine Atony

Madiha Afzal,[1] Uzma Aziz,[2] Hadia Shabbir[3]

Abstract

Objective: To evaluate the effectiveness of uterine balloon tamponade using a condom catheter in the management of primary postpartum haemorrhage due to uterine atony.

Methods: This prospective study was done in the department of obstetrics and gynae unit II at Arif memorial teaching hospital, Rashid Latif Medical College from 1st March 2020 till 28th February 2021. Fifty patients either booked or unbooked, between age 20 to >35 years, either primipara, multipara or grand multipara, at 34-36+6 weeks or 37-39+6 week of gestation, suffering from primary postpartum haemorrhage due to uterine atony following vaginal delivery or Caesarean section, refractory to medical management were included. The main outcome measure was to check for the effectiveness of balloon tamponade to arrest bleeding within first 20 minutes of its insertion. The data was analyzed using SPSS version 20.

Results: The mean age of study participants was 28.3±2.79 years. The mean gestational age of patients was 37.79±1.49 weeks. 30(60%) patients out of 50 were multipara. 34(68%) patients were unbooked. 35(70%) Patients having Primary PPH delivered vaginally while 15(30%) patients delivered by caesarean section. 30(60%) patients delivered vaginally and 13(26%) patients having caesarean section responded to balloon tamponade within 20 minutes of its insertion making it effective in total 43(86%) patients. While in 5(10%) patients of SVD and 2(4%) patients of LSCS, Tamponade failed to control bleeding in first 20 minutes of its placement in uterine cavity and labelled as ineffective in total 7(14%) of the patients.

Conclusion: Intrauterine balloon tamponade is an effective means of controlling primary PPH as it is easily available, easier to practice and inexpensive treatment modality to treat PPH due to atonic uterus.

Key Words: Primary postpartum haemorrhage (PPH), Balloon tamponade, Condom catheter, Effectiveness.

How to cite: *Afzal M., Aziz U., Shabbir H. Effectiveness of intrauterine balloon tamponade in the control of PPH due to uterine atony. Esculapio 2021;17(02):132-136.*

DOI: ***https://doi.org/10.51273/esc21.251724***

Introduction

Primary Postpartum hemorrhage (PPH) is defined as blood loss greater than 500ml following vaginal delivery and greater than 1000 ml following caesarean section from the female genital tract within first 24 hours of delivery.[1] Primary postpartum hemorrhage remains the leading cause of maternal mortality with 38000 maternal deaths reported worldwide in 2017 and 90% of these deaths occurring in low income countries.[2] In Pakistan, the reported incidence of PPH is 34%.[3]

The most common cause of PPH is uterine atony which accounts for 70% cases of PPH while other causes include retained placenta (10%), lower genital tract trauma (20%), uterine rupture, uterine inversion and disseminated intravascular coagulation (<1%).[4] In a modern obstetric consultant led unit, when a patient presents with PPH, stepwise management protocol is followed. Where uterine atony is found to be the cause of primary PPH, the steps of management include uterine message, administration of uterotonic agents, followed by operative interventions including laparotomy to apply uterine compression sutures, uterine and internal iliac artery ligation or hysterectomy. But the morbidity and cost associated with these surgical procedures or the patient's own desire to retain her fertility

1. Madiha Afzal 2. Uzma Aziz
3. Hadia Shabbir
1-3: Department of Obstetrics and Gynecology Unit II, Arif Memorial Teaching Hospital, Rashid Latif Medical College

Correspondence:
Dr. Madiha Afzal Assistant Professor Department of Obstetric and Gynaecology Rashid Latif Medical College, Lahore.
email: madiha.afzal@rlmc.edu.ok

Submission Date: 17-03-2021
1st Revision Date: 12-04-2021
Acceptance Date: 03-05-2021

has led the obstetricians to add uterine balloon tamponade as a preliminary management step for management of PPH before jumping onto the surgical procedures.[5]

In balloon tamponade, balloon technology based on the principle of a fluid filled structure exerting a tamponade effect on bleeding sinuses is used for PPH management. Different balloon devices have been used like Sangstaken-Blackmore tube, Rush balloon catheter, Foley's catheter or condom catheter with a reported success rate of 84%.[6]

Balloon tamponade is least invasive, successful in low resource settings, does not require extensive training programme or complex instruments and can be used at different levels of health care professionals (LHV, private clinics, tertiary care hospitals) allowing easier identification of failed cases necessitating surgical exploration.[7] The timely use of balloon tamponade after PPH due to uterine atony can prevent massive blood lose and maternal mortality. We conducted this study at our hospital to review the effectiveness of balloon tamponade using condom catheter to arrest primary PPH due to uterine atony keeping in mind the low cost and easy availability of condoms.

Method

The study was done in the department of Obs/gynae at Arif Memorial Teaching Hospital affiliated with Rashid Latif Medical Complex for a period of 1 year from 1st March 2020to 28th February 2021 after taking Ethical approval from ethical review board of RLMC. It was a prospective study. 50 patients were enrolled in the study using non probability consecutive sampling technique after fulfilling the inclusion criteria which was;

Booked or unbooked patients, between 20 to >35 years of age, either primipara, multipara or grand multipara, at 34-36 +6 weeks or 37-39 +6 weeks of gestation, suffering from PPH due to uterine atony following SVD (> 500ml blood loss) or Caesarean section (>1000 ml blood loss), refractory to medical management.

Those patients having PPH due to genital tract trauma, retained products of conception, suspected uterine rupture, associated uterine fibroid, any known coagulation disorder or caesarean section done for placenta previa/morbidly adherent placenta were excluded from the study.

Written informed consent was taken from the patient and her family after fulfilling the inclusion and exclusion criteria. In patients who developed primary PPH after spontaneous vaginal delivery or after completion of caesarean section, with aseptic measures, a Sims' speculum was introduced into the vagina to expose the cervix and then a sterile silicon Foley's catheter of French gauge 20 with a condom fitted on it with silk number 1 making it condom catheter was inserted inside the uterine cavity with the help of sponge holding forceps. This condom catheter was inflated with 300-500ml normal saline. At the same time in both these cases, 40 units of injection oxytocin in 1L ringer lactate were started in infusion form at the rate of 16 drops/ minute to maintain contractility of the uterus. The patients undergoing the procedure were kept under observation for any active bleeding after the tamponade for next 20 minutes. Here the subjective assessment of blood loss was done with the help of 12×12 inch woven laparotomy sponge with blood absorbing capacity of 50-100 ml. Those patients having a well contracted uterus and no active bleeding through the cervix within first 20 minutes of condom catheter insertion were considered as successful for the procedure with an effective tamponade. The infusion syntocinon was continued for next 24 hours. In these patients, condom catheter was left in situ for 24 hours and then removed by gradual deflation at the rate of 50ml/ hr by senior obstetrician with infusion oxytocin going on for another 6 hours. But those patients having persistent uterine atony with active bleeding coming through cervical os soaking one 12×12 inch sponge even after 20 minutes of condom catheter insertion were labelled as unsuccessful for the procedure and balloon tamponade being declared as ineffective. These patients were immediately explored for further surgical interventions. In this study, our main outcome measure was to check the effectiveness of balloon tamponade to arrest bleeding within first 20 minutes of its insertion.

The data of study population e.g. age, parity, duration of gestation, booking status, mode of delivery and time for balloon tamponade to be effective to label as successful or unsuccessful was noted on a pre designed proforma. The data was analyzed using SPSS version 20. Quantitative variables like age, parity gestational age were presented as mean. Qualitative variables like booking status, mode of delivery, effectiveness of balloon tamponade and time to be effective were calculated as percentages.

Results

Table no 1 shows the demographic features of the study

population. 10(20%) of the patients were in the age group of 20-25 years,13(26%) patients were between 26-30 years of age and 7(14%) patients were > 35 years of age. The mean age of our study population was 28.3± 2.79.

Table 1: *Demographic feature of study population*

Age (in years)	No. of patients	Percentage
20-25	10	20 %
26-30	13	26 %
31-35	20	40 %
>35	07	14 %
Total	50	100 %
Mean age	28.3± 2.79	
Parity		
Primi para	16	32 %
Multi para	30	60 %
Grand multi para	04	08 %
Total	50	100 %
Gestational Age		
34-36 $^{+6}$ weeks	21	42 %
37-39 $^{+6}$ weeks	29	58 %
Mean age	37.79±1.49	
Booking Status		
Booked	16	32 %
Un booked	34	68 %
Total	50	100 %

Amongst 50 patients, 16(32%) patients were primipara, 30(60%) patients were multipara and 4(8%) were grand multipara. Regarding gestational age, 21(42%) patients were at 34-36 +6 weeks of gestation and 29 (58%) patients were between 37-39 +6 weeks of gestation at the time of their delivery. The mean gestational age was calculated as 37.79±1.49. Out of 50 patients, 16(32%) were booked and 34(68%) were unbooked.

Table 2 shows the mode of delivery and its relationship with effectiveness of balloon tamponade. Out of 50 patients, 35(70%) patients delivered by vaginal route had PPH. Out of these 35 patients, the balloon tamponade was effective in 30(60%) patients and failed in 5(10%) of the patients. 15(30%) patients undergone caesarean section had PPH and out of these 15 patients, balloon tamponade was successful in 13(26%) patients while it was unsuccessful in 2(4%) patients. Thus the balloon tamponade was found effective in 43(86%) patients and it was ineffective in 7(14%) of the patients.

Table 2: *Mode of delivery and effectiveness of balloon tamponade*

MOD	No. of patients	Effectiveness	
		Successful	Unsuccessful
SVD	35 (70%)	30(60%)	5(10%)
LSCS	15 (30 %)	13(26%)	2(4%)
Total	50 (100 %)	43(86%)	7(14%)

Table 3 shows the time for balloon tamponade to become effective to control bleeding. Out of 50 patients, in 14(28%) patients, it took <10 minutes for balloon tamponade to become effective, in 29(58%) patients, balloon tamponade become effective between 10-20 minutes and considered as successful in both above mentioned cases. In 7(14%) patients, balloon tamponade did not control bleeding even after 20 minutes of insertion and was considered as unsuccessful.

Table 3: *Time for balloon tamponade to be effective*

Time	No of patients	Percentage
<10 minutes (Successful)	14	28 %
10-20 minutes (Successful)	29	58 %
>20 minutes (Unsuccessful)	07	14 %
Total	50	100 %

Discussion

The top most cause of maternal mortality worldwide is obstetrical haemorrhage which is responsible for 25% of all the maternal deaths with a case fatality rate of 1% (8). Immediate and timely action is the key to save life in the instance of PPH. Current British and American society of Obstetrics guidelines recommend contemplation of uterine balloon tamponade before opting for invasive surgical procedures in case of postpartum haemorrhage that is refractory to medical therapy.[4,9] The present research was carried out to assess the effectiveness of uterine tamponade using condom catheter in patients suffering from atonic postpartum haemorrhage.

In our study average age of the patients were 28.3± 2.7 years, which is in comparison to mean age 28.8 years observed in the study of Jaleel et al.[10] In this study 60 % patients were multipara. This finding is comparable to that done by Humphrey[11] who also concluded that multiparous women are more likely to have atonic postpartum hemorrhage. This is most probably due to inadequate antenatal care they receive and associated risks (e.g. anemia, diabetes and hypertension) with multiparity predisposing them to postpartum hemorrhage. In our study the mean gestational age was 37.79± 2.79 which can be compared with the study by Kadioglu et al who documented a mean gestational

age of 37.9±3 weeks.[12] 68% patients having postpartum hemorrhage were unbooked in our study. This can be compared with study of R. Lohano et al who concluded that 70% patients in his study having PPH were unbooked showing that booking status is important to anticipate the risk of PPH.[13]

With regard to mode of delivery, 70% patients in our study who had postpartum haemorrhage delivered vaginally while 30% delivered by lower segment caesarean section. This result can be compared with the study of Manisha et al who showed that 76% patients delivered vaginally and 24% patients delivered by Caesarean section had postpartum hemorrhage[(14)]. This shows that although abdominal delivery is thought to be a risk factor for atonic PPH but in our study, patients having vaginal delivery suffered more from PPH.

In our study, the balloon tamponade was successful in 86% cases. It was ineffective in 14% of the cases and those patients underwent surgical intervention in the form of B-lynch suture, uterine artery ligation, internal iliac ligation or hysterectomy. This effectiveness of balloon tamponade to control obstetric haemorrhage can be compared with study of Suarez et al who reported the success rate of balloon tamponade of 85.9% while it failed to control haemorrhage in 14.1% cases.[15]

We also observed the time for balloon tamponade to be effective. In our study 86% patients responded to tamponade with in first 20 minutes of balloon placement while 14% patients did not respond to balloon tamponade within first 20 minutes where it was considered as failed. This finding of our study is in comparison to that done by Kumar A et al who observed that in 90% patients, the postpartum bleeding responded to balloon tamponade within 20 minutes of intrauterine placement while in 8% patients, it was considered as a failed procedure as it did not control bleeding within 20 minutes of tamponade insertion.[16] In our study, no cases of haemorrhage were reported with balloon tamponade being removed 24 hours after its placement which is similar to the study done by Tirumuru.et al.[17]

Conclusion

Thus, we have concluded from our study that majority of the cases of primary postpartum haemorrhage due to uterine atony can be managed effectively with the timely use of intrauterine balloon tamponade. Reducing the maternal morbidity and mortality due to primary postpartum haemorrhage requires various evidence-based approaches to be employed effectively and uterine balloon tamponade has emerged as a promising approach amongst these methods.

Acknowledgment

The authors are grateful to the worthy professors, Professor Sohail Khurshid Lodhi, Professor Yousaf Latif and Professor Asma Yasin for their guidance in the current research.

Conflict of interest None

References

1. B-Lynch C, Keith L, Lalonde A, Karoshi M. A Textbook of Postpartum Hemorrhage: A Comprehensive Guide to Evaluation. Management and Surgical Intervention, Jaypee Brothers, New Delhi, India. 2006.
2. Sheikh L, Zuberi NF, Riaz R, Rizvi JH. Massive primary postpartum haemorrhage: setting up standards of care. JPMA: Journal of the Pakistan Medical Association. 2006;56(1):26.
3. Bibi S, Danish N, Fawad A, Jamil M. An audit of primary post partum haemorrhage. Journal of Ayub Medical College Abbottabad. 2007;19(4):102-6.
4. Obstetricians RCo, Gynaecologists. Postpartum Haemorrhage, Prevention and Management (Green-top 52). Royal College of Obstetricians and Gynaecologists London; 2009.
5. Condous G, Arulkumaran S, Symonds I, Chapman R, Sinha A, Razvi K. The "tamponade test" in the management of massive postpartum hemorrhage. Obstetrics & Gynecology. 2003;101(4):767-72.
6. Doumouchtsis SK, Papageorghiou AT, Arulkumaran S. Systematic review of conservative management of postpartum hemorrhage: what to do when medical treatment fails. Obstetrical & gynecological survey. 2007; 62(8): 540-7.
7. Akhter S, Begum MR, Kabir Z, Rashid M, Laila TR, Zabeen F. Use of a condom to control massive postpartum hemorrhage. MedGenMed: Medscape general medicine. 2003;5(3):38-.
8. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. The lancet. 2006; 367(9516): 1066-74.
9. Obstetricians ACo, Gynecologists. ACOG practice bulletin: clinical management guidelines for obstetrician-gynecologists number 76, October 2006: postpartum hemorrhage. Obstetrics and Gynecology. 2006; 108(4):1039-47.
10. Jaleel R, Khan A. Post-partum haemorrhage--a risk factor analysis. Mymensingh medical journal: MMJ. 2010;19(2):282-9.

11. Humphrey MD. Is grand multiparity an independent predictor of pregnancy risk? A retrospective observational study. Medical journal of Australia. 2003; 179 (6):294-6.
12. Kadioglu BG, Tanriverdi EC, Aksoy AN. Balloon tamponade in the management of postpartum hemorrhage: three years of experience in a single center. Open Journal of Obstetrics and Gynecology. 2016; 6(12): 698- 704.
13. Lohano R, Haq G, Kazi S, Sheikh S. Intrauterine balloon tamponade for the control of postpartum haemorrhage. J Pak Med Assoc. 2016;66(1):22-6.
14. Gupta M, Jain M. Role of condom catheter balloon tamponade in management of atonic postpartum haemorrhage in cases of failed medical management. International Journal of Clinical Obstetrics and Gynaecology. 2017;1(2):62-4.
15. Mavrides E, Allard S, Chandraharan E, Collins P, Green L, Hunt B, et al. On behalf of the Royal College of Obstetricians and Gynaecologists. Prevention and management of postpartum haemorrhage BJORG. 2016; 124.
16. Aruna K, Khushboo K, Shubha S. A study of the efficacy and safety of the balloon tamponade in the management of atonic post-partum hemorrhage. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2020;9(4):1576-9.
17. Sahithi T, Samiramis S, Hassan M, Basem M. Intrauterine balloon tamponade in the management of severe postpartum hemorrhage: A case series from a busy UK district general hospital. Open Journal of Obstetrics and Gynecology. 2013;3:, 131-6.

Authors Contribution

M.A: Conceptualization of Project

UA: Data Collection

M.A, U.A: Literature Search, Statistical Analysis

M.A, U.A, H.S: Drafting, Revision, Writing of Manuscript

Prevalence of Smoking Among Prison Population in Punjab, Pakistan: A cross-Sectional Study

Muhammad Rehan Mian,[1] Khalid Mahmood,[2] Bushra Faiz,[3] Uzma Intisar,[4] Aslam Pervaiz[5]

Abstract

Objective: The study was conducted to assess the prevalence of active and passive smoking among prisoners confined in Punjab Prisons.

Methods: A cross-sectional study was conducted during 15th January to 15th March, 2017. A total of 301 male adult prisoners were enrolled through proportionate random sampling from 29 prisons of Punjab. Trained medical staff administered a structured pre-tested questionnaire to collect data on tobacco consumption, exposure to secondhand smoke and demographic variables. Data was analyzed by Epi Info software and chi-square test at 95% level of confidence applied.

Results: Mean age of participants was 40 years (range; 16 – 90 years). Prevalence of smoking among prisoners was 43% (95% confidence interval [CI]: 37.2 - 48.7). Out of nonsmokers, 84% (95% CI: 77.34 – 88.90) prisoners were exposed to secondhand smoke. High education was protective against smoking (27% versus 45% with below college degree; OR: 0.45; (95% CI: 0.2 – 0.96). Higher prevalence trend was observed with increasing age (39% up to 25 years, 42% among 26 to 45 years and 47%, > 45 years). Prevalence was high among single as compared to married (46% versus 41%) males.

Conclusion: Prevalence of smoking and exposure to secondhand smoke among prisoners was high which indicates an epidemic like situation. Being single, illiteracy and age were the associated factors with high prevalence of active smoking. There is an urgent need for health promotion and anti-tobacco education campaign in prisons.

Keywords: Smoking, Prevalence, Prison population, Punjab, Pakistan

How to cite: *Mian R.M., Mahmood K., Faiz B., Intisar U. Pervaiz A. Prevalence of smoking among prison population in Punjab, Pakistan: A cross-sectional Study. Esculapio 2021;17(02):137-142.*

DOI: ***https://doi.org/10.51273/esc21.251725***

Introduction

Smoking, the inhalation of the smoke of burning tobacco in different ways,[1] kills up to half of its user.[2] Smoking is the leading cause of preventable deaths and incurs billions of dollars to the United States each year.[3] Smokers die 10 years earlier when compared to non-smokers.[3] More than 8 million people die each year due to smoking tobacco[2] which accounts for 11.5% deaths worldwide.[4] Almost 7 million deaths are due to direct smoking, whereas, 1.2 million deaths are due to secondhand smoking.[2] Low-and-Middle income countries share almost 80% of the world's 1.3 billion tobacco smokers' burden.[2] About 20% of the adult men smoke in Pakistan.[5] Though thousands of young people start smoking each day, many young adults want to quit this addiction but with a low success rate.[3]

In many developed countries, it has been observed that there is a declining trend in tobacco smoking prevalence except for prisons,[6] where there is exponential increase in the population across the globe.[7] The over-representation of disease, illness and health-related behaviours especially smoking have been evident within this population group.[8] Smoking tobacco is an integral part of prison life in the form of stress reliever and social control or lubricant.[9] Furthermore, high nicotine dependency,

1. Muhammad Rehan Mian
2. Khalid Mahmood
3. Bushra Faiz
4. Uzma Intisar
5. Aslam Pervaiz

1. *Research Department, The Healthy Word Organization*
2,3,4: Department of Forensic Medicine
5. Punjab Health Department

Correspondence:
Dr. Aslam Pervaiz, *Assistant Professor, Punjab Health Department.*
E-mail: aslam_pervaiz92@yahoo.com

Submission Date: 31-03-2021
1st Revision Date: 17-04-2021
Acceptance Date: 17-05-2021

mental illness, and lack of smoking cessation programmes are the identified determinants of smoking in prisons.[9] In recent times, the ban on smoking in prisons gained favours especially in North America, but in other Western World, prisoners are facilitated with enclosed spaces for smoking.[9]

Around 16 million of Americans are living with a disease caused by smoking.[3] Smoking not only causes cancer, heart disease, stroke, lung disease, diabetes, Chronic Obstructive Pulmonary Disease (COPD) but also increases the risk of tuberculosis, eye problems, and poor immune functionality, such as rheumatoid arthritis.[3] Tobacco as a cardiac poison is although an established fact yet is the most ignored aspect of Heart Health programs. By and large cigarette smoke is associated with lung carcinoma, however, the cardiovascular morbidity is a major outcome of smoking. The elemental biochemistry of tobacco has an integral role in atherosclerosis.[10] Nicotine being the crucial culprit can be traced in blood as well as in the urinary metabolites such as cotinine, thiocyanate, and carbon monoxide, play the cardinal role in the pathogenesis of endothelial dysfunction[(10)]. The atherogenic cascade is inclusive of intimal damage, by lipoprotein deposition, which undergoes the oxidative process, followed by inflammatory mediators eventually causing a plaque formation.[10] Consequential additive damage of hematological nature adds further insult by increasing leucocyte count and platelet aggregation which causes enhanced adhesiveness with raised fibrinogen on existent dyslipidemia.[10] It is also a known cause of erectile dysfunction in males, leading to poor sexual life.[3] It is evident that smoking can initiate the use of drugs[11] like research exhibited that the drugs like heroin, crystals, cannabis, synthetic substances, ice, and opioids were commonly used among male prisoners.[12]

When it comes to breathing the air of prisons, where the prevalence of smoking is high, it is often an unbreathable air.[13] It is not only the active smoking which is the killer but rather the passive exposure which is an equal offender in putting the non-willing individuals to a deadly threat. Exposure to secondhand smoke has been proven as a health deterioration factor for at least the last thirty-five years.[14] Secondhand smoking is not only harmful to prisoners but also an unavoidable risk factor for prison staff as it has been accentuated for the development of smoke-free policies in a survey of 15 prisons in Scotland.[14] In comparison to this, it is worth mentioning that out of 32 prisons in Punjab, with a capacity of 21,500, around 52,318 persons are being kept in prisons amplifying the exposure.[15] In 2016, almost 16.99% of male deaths were attributed to smoking in Pakistan and this was more than on average as compared to medium human development index - countries.[5]

According to Pakistan Prisons Rules 1978, Rule 345, condemned prisoners can smoke cigarettes or biris at their own expense, but these will be obtained through the prison.[16] Prisoners who smoke and are unable to obtain cigarettes at their own cost, may be given five cigarettes daily at Government expense.[16] Smoking is not only harmful to health but also the treasury of Pakistan due to additional economic loss.[5] Overcrowding and confinement of smokers with nonsmoker prisoners leads to passive smoking, the prevalence of smoking, the burden of secondhand smoke and associated factors among prisoners in Punjab Prisons are yet to be explored as there was very limited evidence available making the rationale of this study. The primary objective of this study was to assess the prevalence of active and passive smoking among prisoners confined in Punjab Prisons and associated risk factors. Findings will be valuable for policy makers to formulate evidence-based strategies to minimize smoking among prisoner population in Punjab.

Methods

A descriptive cross-sectional study was conducted during 15th January to 15th March, 2017 in 29 male prisons of Punjab, Pakistan. The sample size was calculated by using Epi Info software. The data was collected from 301 male adult prisoners by proportionate random sampling. The inclusion criteria were all the male adult inmates those were present during study period irrespective of their age and status in any prison and those refused to participate were excluded. Pretested structured interview-based questionnaire translated to the local language was administered.

Data were collected by trained prison medical staff after obtaining informed consent. The variables were age, residential status (rural and urban), marital status (divorced, married, unmarried and widower), education (illiterate, primary, secondary, above secondary), duration of confinement, tobacco consumption and exposure to secondhand smoke (yes or no). Data was analyzed by Epi Info software. Prevalence and Odds Ratios were calculated with 95% confidence interval. Chi-square test was applied. p value ≤ 0.05 was considered as significant.

Results

The mean age of the participants was 40 years (Range: 16-91 years). The prevalence of tobacco smoking was found to be 43% (95% confidence interval [CI]: 37.2 - 48.7). Exposure to secondhand smoke was 84% (95% confidence interval [CI]: 77.34 – 88.90) out of non-smokers.

Out of smokers, 69% were from rural background but there was no association of smoking with rural or urban background (Odds Ratio: 1.018: 95% confidence interval [CI]: 0.62 – 1.67) and duration of incarceration (x^2 [4] = 2.956; P-value = 0.56). High education was depicted protective against smoking (27% versus 45% with below college degree; Odds Ratio: 0.45; 95% confidence interval [CI]: 0.20 – 0.96). Higher prevalence trend was observed with increasing age (39% up to 25 years versus 42%, among 26 to 45 years versus 47%, > 45 years). Prevalence of smoking high among single as compared to married (46% versus 41%).

Table 1: *Age Distribution of Smokers and Non- Smokers Among Sample Population*

S/N	Age Groups	Smokers (n = 129)	Non-smokers (n = 172)	Total (N= 301)
1.	≤24 Years	13 (10%)	14 (8%)	27 (9%)
2.	25 - 34 Years	41 (32%)	69 (40%)	110 (37%)
3.	35 - 44 Years	27 (21%)	38 (22%)	65 (22%)
4.	45 - 54 Years	21 (16%)	24 (14%)	45 (15%)
5.	≥55 Years	27 (21%)	27 (16%)	54 (18%)

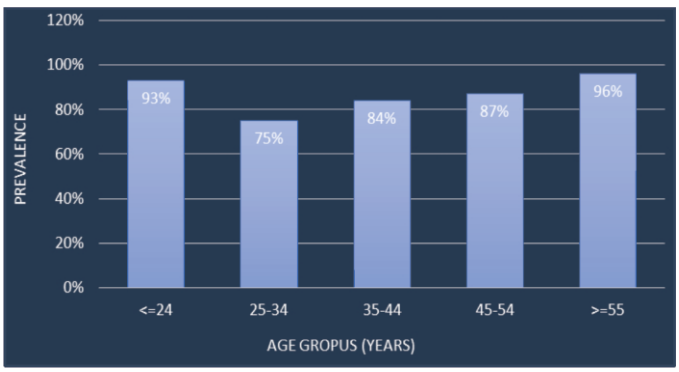


Fig- 1: *Prevalence of Secondhand Smoking among Different Age Groups of Non-Smoker Prisoners (N= 172).*

The prevalence of secondhand smoking in non-smokers was found to be very high in all age-groups (>=55 age group, the highest prevalence as shown in **Fig-1**).

There was no significant difference found between the type of prison and the prevalence of smoking (P-value = 0.27).

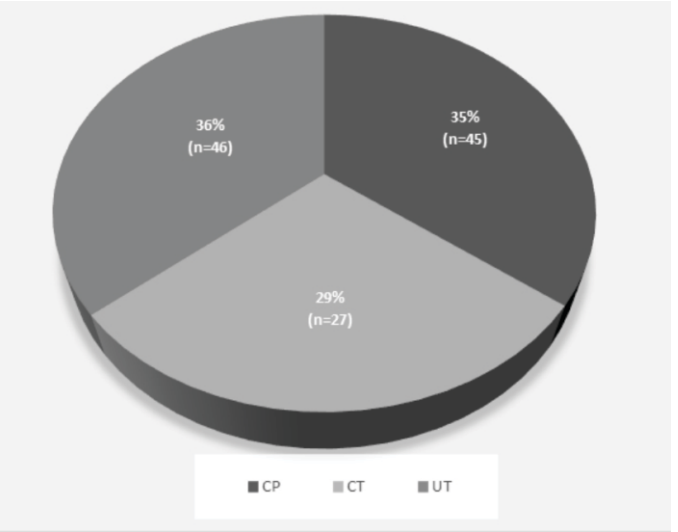


Fig-2: *Prevalence of Smoking among different Categories of Prisoners: Condemned Prisoner (CP), Convicted Prisoner (CT), Under Trial Prisoners (UT)*

Discussion

This study, aimed to identify the prevalence of smoking among male prisoners in Punjab, depicted very high prevalence as compared to the general population (male adults) in Pakistan (43% vs 20.6%).[5] The high smoking rate in prisons is not only a public health problem of developing countries but also the persistent problem of developed countries. There are many factors causing the surge in prevalence of smoking in prisons. The prevalence of smoking in Punjab prisons in this study was found slightly lower as compared to 55.6% identified in both black and non-black current prisoner smokers in a study conducted in three states of USA.[17] Most of the studies identified smoking prevalence 50% to 83 % among prisoners in different settings[17] and nearly 70% far higher than the prevalence of smoking in the general population of USA.[18] The possible reasons for the slightly lower prevalence of smoking among Punjab prisons may be due to restriction, availability, and affordability, socio-economic, and cultural factors.

It is evident that 33.33% of the World's population is exposed to secondhand smoking with 600,000 deaths annually.[19] Pakistan's 69.1% population is exposed to secondhand smoking at public places compared to 43.3% exposed at homes.[19] This study explored 84% prevalence of secondhand smoking among male prisoners which is comparatively higher than among the general population in Pakistan. The burden of hazard to secondhand smoke among non-smoker inmates is obvious. It is indirect indicator of high concentration

of fine particulate matter (PM2.5) in prisons.[20]

The higher education had been identified as a protective factor against smoking in prisons (Odds ratio: 0.45). Such characteristic is bolstered by a study in which same trend had been observed for the Greeks.[21] In contrast with prisoners, it is worth mentioning that same trend has had been observed for the general population.[22] Illiterate as well as elderly prisoners were more indulged to active smoking.[22] Living background (rural or urban) did not find to be associated with smoking among prisoners as the Odds Ratio was 1.08, though it is aforementioned that education is a protective factor against smoking and rural/urban background prisoners might differ in education status too, but there was no association in smoking. The possible factor might be the behavior adaption in mixed population and urban prisoners might started smoking during incarceration period. Although, it is evident that the rural population of Pakistan was more active tobacco cigarette smokers as compared to urban population (21.1% vs 15.9%).[23]

Our findings showed that the single men were more exposed to active smoking as compared to married. It is evident that the married men (USA) were less exposed to smoking "as reported in four Health Information National Trends (HINTS) 2011-2017",[24] supporting the current study. In a survey of 172 men prisoners, released from California State (United States of America) between 2009 and 2011, 74% were current smokers and odds of smoking habit was high among inmates those were incarcerated since five years.[25] However, in our study impact of duration of incarceration on smoking was statistically insignificant.

In general population, smoking cessation programs more focus on youth instead of elderly population although the elders are at high risk of lung cancer, chronic obstructive pulmonary disease, and cardiovascular disease. The results of this study showed increasing trend of smoking with increasing age. The incarceration beyond capacity might not only affect the smoking behavior but also increase the risk of premature mortality among elders. The choice of high to low or no exposure from cigarette smoke (secondhand smoke) is unavoidable among all age groups especially when prisons are overcrowded as we did not find any difference between secondhand smoke in all age groups. The inexistence of any association between type of prison and smoking might be justified by the same social environment, lack of smoking cessation programs, and mental illness throughout the prisons.

Recommendations

Prison period is an ideal time for education and any type of intervention. A complete ban on smoking did not prove helpful in preventing tobacco use among prisoners. Confining separately smokers and non-smokers will be a successful strategy to prevent non-smokers from secondhand smoke. There is an urgent need for health promotion and anti-tobacco education campaign. Cost-free cessation medications may be helpful to decline or quit the smoking among prisoners. History of incarceration might be a strong predictor of high rates of smoking-related morbidity and mortality among male prisoners, thus needed to be explored Tobacco smoking is the leading cause of preventable mortality across the world. Hence authentic measures are to be taken to not only for an awareness campaign for those directly affected but also the exposed innocent individuals who can avoid it altogether if necessary, precautions are taken to steer clear of such a drastic menace. Prisoners remained the marginalized group and have rarely been included in national tobacco control interventions. So, by including prisoners in such programs can lower the mortality and morbidity caused by smoking.

About 250,000 prisoners release annually from Punjab Prisons. Anti-smoking education in prisons will benefit prisoners before release and after release. Released prisoners spread the message to a wider community. Further studies should be conducted aiming pathways for the policy modifications in smoking clauses of Pakistan Prisons Rules, 1978.

Conclusion

High prevalence of smoking was observed among prison population. Single, illiterate as well as elderly prisoners were more indulged to active smoking. Smoking is the preventable risk factor associated with high rates of morbidity and mortality. This can be minimized by initiating smoking cessation programs inclusive of educational strategies. Otherwise, this smoking epidemic like situation will worsen if ignored in prisons.

Conflict of Interest None

References

1. Smoking | definition of smoking by Medical dictionary [Internet]. [cited 2020 Dec 2]. Available from: https://medical-dictionary.thefreedictionary.com/

smoking

2. Tobacco [Internet]. [cited 2019 Jan 9]. Available from: https://www.who.int/news-room/fact-sheets/detail/tobacco
3. Fast Facts | Fact Sheets | Smoking & Tobacco Use | CDC [Internet]. [cited 2020 Dec 3]. Available from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/fast_facts/index.htm
4. Spaulding AC, Eldridge GD, Chico CE, Morisseau N, Drobeniuc A, Fils-Aime R, et al. Smoking in Correctional Settings Worldwide: Prevalence, Bans, and Interventions. Epidemiol Rev [Internet]. 2018 Jun 1 [cited 2020 Dec 6];40(1):82–95. Available from: https://academic.oup.com/epirev/article/40/1/82/4994065
5. Pakistan | Tobacco Atlas [Internet]. [cited 2020 Dec 5]. Available from: https://tobaccoatlas.org/country/pakistan/
6. Ritter C, Stöver H, Levy M, Etter JF, Elger B. Smoking in prisons: The need for effective and acceptable interventions. J Public Health Policy [Internet]. 2011 Feb 16 [cited 2020 Dec 3];32(1):32–45. Available from: http://link.springer.com/10.1057/jphp.2010.47
7. Walmsley R. World Prison Population List eleventh edition [Internet]. [cited 2020 Dec 3]. Available from: www.prisonstudies.org,
8. Woodall J, Tattersfield A. Perspectives on implementing smoke-free prison policies in England and Wales. Health Promot Int [Internet]. 2018 Dec 1 [cited 2020 Dec 3];33(6):1066–73. Available from: https:// academic.oup.com/heapro/article/33/6/1066/3866451
9. Butler T, Richmond R, Belcher J, Wilhelm K, Wodak A. Should smoking be banned in prisons? [Internet]. Vol. 16, Tobacco Control. 2007 [cited 2020 Dec 4]. p. 291–2. Available from: https://tobaccocontrol.bmj.com/ lookup/doi/10.1136/tc.2007.021600
10. Siasos G, Tsigkou V, Kokkou E, Oikonomou E, Vavuranakis M, Vlachopoulos C, et al. Smoking and Atherosclerosis: Mechanisms of Disease and New Therapeutic Approaches. Curr Med Chem [Internet]. 2014 Oct 18 [cited 2021 Jan 3];21(34):3936–48. Available from: https://pubmed.ncbi.nlm.nih.gov/ 25174928/
11. Cigarette Smoking Increases the Likelihood of Drug Use Relapse | National Institute on Drug Abuse (NIDA) [Internet]. [cited 2020 Dec 8]. Available from: https://www.drugabuse.gov/news-events/nida-notes/ 2018/05/cigarette-smoking-increases-likelihood-drug-use-relapse
12. View of Prevalence and reasons of use of different psychoactive substances among prisoners at Malir Prison, Karachi. [Internet]. [cited 2020 Dec 8]. Available from: http://www.theprofesional.com/index.php/tpmj/article/view/4473/3706
13. Collier R. Prison smoking bans: clearing the air. [Internet]. Vol. 185, CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne. 2013 [cited 2020 Dec 4]. p. E474–E474. Available from: http://www.cmaj.ca/cgi/doi/ 10.1503/cmaj.109-4486
14. Semple S, Sweeting H, Demou E, Logan G, O' Donnell R, Hunt K. Characterising the exposure of prison staff to second-hand tobacco smoke. Ann Work Expo Heal [Internet]. 2017 Aug 1 [cited 2020 Dec 4];61(7):809–21. Available from: https://academic.oup.com/annweh/article/61/7/809/3965339
15. Khan MM. The Prison System in Pakistan. Vol. 35, Pakistan Journal of Criminology. 2010.
16. PAKISTAN PRISONS RULES, 1978 [Internet]. [cited 2020 Dec 4]. Available from: https:// prisons.punjab.gov.pk/system/files/Pakistan Prison Rules 1978 %28Final%29.pdf
17. Valera P, Reid A, Acuna N, Mackey D. The smoking behaviors of incarcerated smokers. Heal Psychol Open [Internet]. 2019 Jan 1 [cited 2020 Dec 6];6(1). Available from:/pmc/articles/PMC6328956/?report= abstract
18. Zhang J. Prison smoking bans in the United States: current policy, impact and obstacle. J Hosp Manag Heal Policy [Internet]. 2018 [cited 2020 Dec 6]; Available from: http://dx.doi.org/ 10.21037/jhmhp.2018.04. 06
19. Exposure of the Adult Pakistani Population to Second-Hand Smoke - An insight from Global Adult Tobacco Survey of Pakistan 2014 - PubMed [Internet]. [cited 2020 Dec 5]. Available from: https://pubmed.ncbi.nlm. nih.gov/31324907/
20. Semple S, Sweeting H, Demou E, Logan G, O'Donnell R, Hunt K. Characterising the Exposure of Prison Staff to Second-Hand Tobacco Smoke. Ann Work Expo Heal [Internet]. 2017 Aug 1 [cited 2020 Dec 6];61(7):809–21. Available from: https://academic.oup.com/ annweh/article/61/7/809/3965339
21. Makris E, Gourgoulianis KI, Hatzoglou C. Prisoners and cigarettes or imprisoned in cigarettes? What helps prisoners quit smoking? BMC Public Health [Internet]. 2012 Dec 7 [cited 2020 Dec 16];12(1):508. Available from: http://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-12-508
22. Çiftci F, Ayoz S, Baygul D, Onen ZP, Sen E. Smoking behaviour and age. In: European Respiratory Journal [Internet]. European Respiratory Society (ERS); 2018 [cited 2020 Dec 16]. p. PA4539. Available from: https://sci-hub.se/https://erj.ersjournals.com/content/52/suppl_62/PA4539
23. Saqib MAN, Rafique I, Qureshi H, Munir MA, Bashir R, Arif BW, et al. Burden of tobacco in Pakistan:

Findings from global adult tobacco survey 2014. Nicotine Tob Res [Internet]. 2018 Aug 14 [cited 2021 May 18]; 20(9):1138–43. Available from: https:// academic. oup.com/ntr/article/20/9/1138/4084594

24. Ramsey MW, Chen-Sankey JC, Reese-Smith J, Choi K. Association between marital status and cigarette smoking: Variation by race and ethnicity. Prev Med (Baltim) [Internet]. 2019 Feb 1 [cited 2020 Dec 16]; 119:48–51. Available from: /pmc/ articles / PMC6995657/ ?report=abstract
25. Howell BA, Guydish J, Kral AH, Comfort M. Prevalence and factors associated with smoking tobacco among men recently released from prison in California: A cross-sectional study. Addict Behav [Internet]. 2015 Nov 1 [cited 2020 Dec 6];50:157–60. Available from: https://pubmed.ncbi.nlm.nih.gov/26150399/

Authors Contribution

M.R.M: Conceptualization of project, Manuscript writing
K.M: Literature Search and Supervision of Data Collection, cleaning of collected Data.

B.F: Statistical Analysis, & discussion

U.I: Literature search and data compilation

A.P: Drafting, Revision, Discussion & Recommendations

Knowledge of Male Partners of Pregnant Females Presenting in Services Hospital Lahore Regarding Contraception

Muhammad Usman,[1] Madeeha Rashid,[2] Asifa Noreen,[3] Hira Naeem,[4] Maria Khalid,[5] Rubina Sohail[6]

Abstract

Objective: To determine knowledge of male partners of pregnant ladies regarding contraceptive methods coming to services hospital Lahore.

Methods: A cross sectional study was carried out in Obstetrics & Gynecology department of Services Hospital, Lahore over a period of six months from 05-05-2018 to 04-11-2018.We interviewed 400 men accompanying their wives in Services Hospital, Lahore to determine their knowledge regarding contraceptive methods and use.

Results: Age of study participants ranged between 20-30 years of age with mean age of 25.4±6.1.There were 145 participants who don't have any children (36.3%) and 199 (49.7%) were having 1-2 children and 56 (14%) were having 3 or more children.189 (47.3%) participants had education of matric or above,152 (38%) were primary and 59 (14.7%) were uneducated. Majority of the patients were earning Rs.10,000-50,000 monthly. Mean number of children were 1.2±.1.1. Adequate knowledge of contraception was reported 113 (28.2%). Stratification with regard to age, parity, education status, socioeconomic status was also carried out.

Conclusion: In conclusion, limited adequate knowledge of male partners about method of contraception was found. Services of family planning in Pakistan can be strengthened significantly by continuous efforts to focusing on knowledge, fears, and misconceptions of men about contraception. Moreover, as this study found, Knowledge of the male partner regarding contraception can be significantly increased by increasing education and socioeconomic status. Involvement of Media and Religious bodies in promoting contraception can also increase knowledge of contraception. Increasing knowledge about contraception can lead to increased contraceptive prevalence rate.

Key Words: Male partner, adequate knowledge of contraception, contraceptive methods

How to cite: *Usman M., Rashid M., Noreen A., Naeem H., Khalid M., Sohail R.Knowledge of male partners of pregnant females presenting in Services Hospital Lahore regarding contraception. Esculapio 2021;17(02):143-146.*

DOI: ***https://doi.org/10.51273/esc21.251726***

Introduction

Contraception is the method used to prevent pregnancy by interfering in process of ovulation, fertilization and implantation. Contraception and family planning has huge impact on social and economic growth of a country and is therefore requires urgent importance from government, healthcare providers and social services.[1-6] Pakistan has contraceptive prevalence rate of 34.2%,[1] as of 2018, which is drastically low, pointing out the huge unmet need for family planning.

Contraception Prevalence rate of Pakistan is lower as compared to other countriesin South Asia or those with similar socioeconomic structure. Contraception Prevalence rate of India, Bangladesh and Nepal is 56.3%, 55.8% and 49.7% respectively.[2]

Different factors have been known to influence the use of contraception among couples. Which include knowledge, access, social acceptance, financial constraints and religious views. Of all the factors, the most

1. Muhammad Usman
2. Madeeha Rashid
3. Asifa Noreen
4. Hira Naeem
5. Maria Khalid
6. Rubina Sohail.

1. Sahara Medical College, Narowal
2-4,6. Services Institute of Medical Sciences, Lahore.
5. Agha Khan Medical Center, Gilgit.

Correspondence:
Dr. Muhammad Usman, *Senior Registrar, Sahara Medical College*
Email: usman6345540@gmail.com

Submission Date: 14-10-2020
1st Revision Date: 07-11-2020
2nd Revision Date: 25-11-2020
Acceptance Date: 20-12-2020

important and influential one in Pakistani society is husband's willingness and support. Many studies have shown that male partner's knowledge regarding different methods of contraception has a huge impact on the prevalence of contraception. A study in Jordan showed 98% of male partners had somewhat knowledge regarding contraception and their contraception prevalence rate is as high as 61.2%.[3] Which shows a direct correlation between husbands' understanding of contraception and its prevalence in society. A study is Nigeria concluded that major factor in rejecting contraception is Husband's disapproval.[7] Study in urban area of Maharashtra, India concluded that male contraceptive measures are the least used methods.[8] Unfortunately we could not find any formal study conducted in Pakistan that assesses the understanding of male partner regarding contraception and its use. A study conducted among university-educated men in Punjab Pakistan concluded that there is a lack of knowledge among married men regarding contraception. And those who have good knowledge have higher prevalence of contraception.[4] Another study in which married women visiting a hospital were interviewed about their knowledge regarding contraception, said that only 51% of the women that use contraception are supported by their families,[5] which is an alarming number.

Considering the importance of family planning and use of contraception in women's health and social progress along with the role of male partner in this regard, I have decided to conduct a research to assess the knowledge of male partners about contraception in Pakistan. It will be the local study of patients and data from this can be used to influence policies and it will help to increase contraception prevalence rate of our country.

Methods

We conducted a descriptive cross sectional survey in Obstetrics & Gynecology department of Services Hospital, Lahore over a period of six months from 05-05-2018 to 04-11-2018. After informed consent 400 cases who fulfilled the inclusion criteria were enrolled in this study following non probability, consecutive sampling. Sample size of 400 calculated with level of confidence 95%, margin of error 5% and percentage of adequate knowledge in males as 51%.[5] Ethical approval for the study was provided by the IRB of the hospital. Those husbands with age group between 20-30 years with any parity, presenting in Outpatient Department of Services Hospital, Lahore were enrolled in study. Husbands who refused to participate and those treated for subfertility were excluded. Demographic data was collected. Husbands of the selected patients were questioned using Questionnaire. Adequate Knowledge of the Husbands of the patients was assessed. Adequate knowledge was labelled as score of 8 or more according to questionnaire and low knowledge was labeled as score less than 8. All the information was collected on a pre-designed validated questionnaire. All the collected data were entered and analyzed through SPSS version 20. Mean and Standard Deviation was calculated for Quantitative Variables like age. Frequency and Percentages were calculated for Qualitative data like adequate knowledge. Effect Modifiers like age, educational status, and socioeconomic status were controlled through stratification. Post stratification Chi-square by taking $p<0.05$ as significant.

Results

Patients ranged between 20-30 years of age with mean age of 25.4±6.1. There were 145 participants who don't have any children (36.3%) and 199 (49.7%) were having 1-2 children and 56 (14%) were having 3 or more children. Matric and above education status participants were 189 (47.3%), Primary or above were 152 (38%) and uneducated were 59 (14.7%). Majority of the patients were earning Rs.10,000-50,000 monthly. Mean number of children were 1.2±.1.1. Adequate knowledge of contraception was reported 113(28.2%). Stratification with regard to age, parity, education status & socioeconomic status was also carried out.

Discussion

Till date, no large scale study has been performed in Pakistan to evaluate knowledge, attitude and practices of male partners regarding family planning practices. Most large-scale surveys assessing family planning practices, knowledge, attitudes and practice surveys; Surveys on world fertility; Surveys on contraception prevalence of the world; and the Demographic and Health Surveys (DHS)[8] ignored male partners and focused on determinants of female use of contraception methods. Ignoring the men in contraceptive studies probably represents the limited involvement and options of men in contraceptive use.[9]

All the women should have autonomy in choosing contraceptive method, with or without cooperation of

Table 1: *Basic Characteristics of Study Population n=400*

Demographic Characteristics	N=400	Percentage (100%)
Age of Male Partner		
20-25	193	48.3%
26-30	207	51.7%
Mean ±SD	**25.4±6.1**	
Number of children		
Nil	145	36.3%
1-2	199	49.7%
3 or above	56	14%
Education		
Uneducated	59	14.7 %
Primary & above	152	38%
Matric & above	189	47.3%
Socioeconomic Status		
<10,000	68	17%
10,000 -50,000	258	64.8%
>50,000	73	18.3%

Table 2: *Knowledge of Contraception*

Knowledge of contraception	Number	Percentage
Yes (Score of 8 or more)	113	28.2%
No(Score less than 8)	287	71.8%
Total	**400**	**100.0**

Table 3: *Stratification for Age*

Age	Adequate knowledge of contraception		Total	P value
	Yes	No		
20-25	39(20.2%)	154(79.8%)	193	P=0.001
26-30	74(35.7%)	133(64.3%)	207	

Table 4: *Stratification for Parity*

Number of Children	Adequate knowledge of contraception		Total	P value
	Yes	No		
Nil	5(3.4%)	140(96.6%)	145	P<0.001
1-2	81(40.7%)	118(59.3%)	199	
3 or above	27(48.2%)	29(51.8%)	56	

Table 5: *Stratification for Educational Status*

Educational status	Adequate knowledge of contraception		Total	P value
	Yes	No		
Matric & Above	81(42.9%)	108(57.1%)	189	P<0.001
Primary or Above	32(21.0%)	120(79%)	152	
Uneducated	-	59 (100%)	59	

Table 6: *Stratification for Socioeconomic Status*

Socioeconomic status (Rs)	Adequate knowledge of contraception		Total	P value
	Yes	No		
< 10,000	0	68(100%)	68	
10,000-50,000	73(28.2%)	186(71.8%)	259	P<0.001
> 50,000	40(54.8%)	33(45.2%)	73	

husband; yet when both the partners are in harmony in seeking healthcare services, chances to seek family planning services are increased. In addition, by effective communication between couples about family planning services and taking men into mainstream can improve health parameters of entire family.[8] Over the past few years, there is increased recognition of the fact that involvement of men in the matters of reproductive health is of key importance. Both the International Conference on Population and Development in 1994 and the Fourth World Conference on Women in 1995 had the recommendation that there should be community programs to involve both husband and wife in decision making related to reproductive health and to share the responsibilities related to this matter. Understanding men's knowledge, attitude and practices is the very first step in involving them in reproductive health.

In Pakistan, the decision makers are usually husbands and it is their knowledge, attitude and practice towards contraception that play a role in contraceptive prevalence rate of society. In present study, 28.2% males reported adequate knowledge of contraception while in a study by Zaidi et al demonstrated that 51% males had adequate knowledge regarding contraception.

Studies clearly showed that almost all men have heard of and talked of birth spacing, but don't have proper knowledge about the contraception. However, with increasing education, the knowledge about contraceptive methods increases. This is in harmony to nationwide studies.[10,11]

As education is a key factor in determining men's knowledge about contraception, structured education campaigns about contraceptive methods should be done to reach out for people having poor knowledge. In present day world, television, internet and social media can be used widely as a way to educate men about contraception and their use. Special emphasis should be laid on inculcating the reproductive education in schools and colleges to increase the knowledge of youth regarding family planning. Many studies in different cultures and demographics have pointed out that education is directly related to knowledge of contraception irrespective of cultural norms.[8,12] Moreover, a study has shown that men with good knowledge and education about contraception are more accommodative and supportive in choosing a contraceptive method for their partner.[8] A nationwide study in Egypt showed that sometime it is a fear of divorce that woman keep on bearing children irrespective of her own wish, with

a sense that with more children will keep her marriage intact.[13]

Religion is an important factor determining the overall contraceptive prevalence rate of a society and should not be ignored. In Pakistan, a country with majority Muslim population, the contraception is viewed with the eye of religion. Each contraceptive method is assessed according to Islamic law about its acceptability and consonance.[14] Since contraception is largely viewed in context of religion and Islamic scholars are looked upon for guidance in this matter, their involvement in large scale, well structured awareness program will be a game changer.

Contraceptive use is affected by factors like age, income, education and number of children both directly and indirectly. Attitude is a key factor in adopting a contraceptive method. Socioeconomic and demographic characteristics play a key role in attitude towards and awareness of contraceptive use. Also, the knowledge of contraceptive use is twice in people living in urban areas as compared to people living in rural areas. In addition, in addition, young people are more aware of contraceptive use and show a good attitude towards contraception, and this knowledge and attitude is directly proportional to education level. Furthermore, couples with more children have more use of family planning services as compared to their counter-parts.[15]

Conclusion

In conclusion, limited adequate knowledge of male partners about method of contraception was found. Services of family planning in Pakistan can be strengthened significantly by continuous efforts to focusing on knowledge, fears, and misconceptions of men about contraception. Moreover, as this study found, Knowledge of the male partner regarding contraception can be significantly increased by increasing education and socioeconomic status. Involvement of media and religious bodies in promoting contraception can also increase knowledge of contraception. Increasing knowledge about contraception can lead to increased contraceptive prevalence rate.

References

1. Contraceptive performance report 2014-15, Pakistan bureau of statistics.
2. Pradhan MR, Reddy H, Mishra N, Nayak H. Contraceptive use dynamics in South Asia: the way forward. Poster Session 103 at the 27th IUSSP Conference, 26-31 August 2013, Busan, South Korea.
3. https://www.uniceforg/infobycountry/jordan _statistics.html
4. Nasir JA, Tahir MH, Zaidi AA. Contraceptive attitude and behaviour among university men: a study from Punjab, Pakistan. J Ayub Med Coll 2010;22:125-8.
5. Nosheen Zaidi, Mahmood Ahmed, Muhammad Wasif Khan, Muhammad Hussain, Ashiq Hussain. Contraceptives knowledge and practices in district Rawalpindi: a hospital based study. Pak Armed Forces Med J 2011; 61:283-6.
6. Adelekan A, Omoregie P, Edoni E. Male Involvement in Family Planning: Challenges and Way Forward. Int J Pop Res 2014;2014:1-9.
7. BalogunO, Adeniran A, Fawole A, Adesina K, Aboyeji A, Adeniran P. Effect of Male Partner's Support on Spousal Modern Contraception in a Low Resource Setting. Ethiop J Health Sci. 2016;26(5):439-448.
8. Drennan M. Reproductive health: new perspectives on men's participation. Population Reports 1998, Series J, No. 46.
9. Ringheim K. Factors that determine prevalence of use of contraceptive methods for men. Stud Fam Plann 1993;24:87-99.
10. Godefroy, Raphael & Lewis, Joshua, 2018. "Does male education affect fertility? Evidence from Mali," Economics Letters, Elsevier, vol. 172(C):118-12
11. Plana O. Male Contraception: Research, New Methods, and Implications for Marginalized Populations. Am J Mens Health. 2017;11(4):1182-1189.
12. Program for Appropriate Technology in Health, Involving men in reproductive health. Outlook 1997;14:1-8.
13. Muanda MF, Ndongo GP, Messina LJ, Bertrand JT. Barriers to modern contraceptive use in rural areas in DRC. Cult Health Sex. 2017;19(9):1011-1023.
14. Adedini SA, Babalola S, Ibeawuchi C, Omotoso O, Akiode A, Odeku M. Role of Religious Leaders in Promoting Contraceptive Use in Nigeria: Evidence From the Nigerian Urban Reproductive Health Initiative. Glob Health SciPract. 2018;6(3):500-514.
15. De Vargas NunesColl, C., Ewerling, F., Hellwig, F. et al. Contraception in adolescence: the influence of parity and marital status on contraceptive use in 73 low-and middle-income countries. Reprod Health 16, 21 (2018).

Authors Contributions

M.U: data analysis, writing, reviewing and finalization
M.R: Review, writing of discussion
A.N: Review, results verification
H.N: Data Collection
M.K: Data Collection
R.S: Supervisor whole research

Effect of Moringa Oleifera Leaves Extract on Bisphenol-A Induced Changes in Venous Drainage of the Liver of Albino Rats

Attya Zaheer,[1] Anum Basit,[2] Rukhsana Jabeen,[3] Afifa Waseem,[4] Zafar Iqbal,[5] Rifat Shamim[6]

Abstract

Objectives: To observe the effects of Ethanolic extract of Moringa Oleifera leaves on Bisphenol –A (BPA) induced changes in diameter of central vein and venous drainage (central vein, portal and sinusoidal) in liver of albinorats.

Methods: This was an experimental study conducted at the animal house of Anatomy Department, PGMI, Lahore. Thirty two albino rats of both sex, weighing 170-200 gms were divided equally into 4 groups as A (control), B, C and D (other groups were experimental). Group A, received corn oil only. Group B, received BPA only 50mg/kg/body weight (wt)., Group C and D received BPA 50mg/kg along with Moringa Oleifera leaves extract (MoLE) 250mg kg/body wt and 500mg kg/body wt respectively. BPA and MoLE was given in single dose through oral route. At the end of seven weeks, rats were dissected, liver was removed and slides were made by using H&E stain. The effect of MoLE on BPA induced venous changes was observed under light microscope. The statistical analysis of results was done by using SPSS 21.

Results: BPA increased the diameter of central vein and produced vascular congestion in group B, which was then reduced by administration of MoLE in group C and D. The healing effect of MoLE was augumented as dose was increased.

Conclusions: Moringa Oleifera leaves prevented the vascular congestion and dilatation induced by BPA in liver of rats . The preventive effect improved as dose was increased.

Key Words: BPA: Bisphenol-A; MoLE: Moringa Oleifera leaves extract.

How to cite: *Zaheer A., Basit A., Jabeen R., Wasim A., Iqbal Z., Shamim R. Effect of Moringa Oleifera Leaves Extract on Bisphenol-A induced changes in Venous drainage of the Liver of Albino Rats. Esculapio 2021;17(02):147-151.*

DOI: ***https://doi.org/10.51273/esc21.251727***

Introduction

Liver plays a major role in the regulation of many physiological processes in our bodies, which include metabolic and secretory functions. It is involved in detoxification of a variety of drugs, chemicals and xenobiotics.[1]

Bisphenol-A (BPA) is a synthetic chemical that has been widely used in synthesis of plastics and epoxy resins,[2] so people of every age are inevitably exposed to BPA in daily life.[3] It is commonly used in manufacturing of baby bottles, food storage boxes, dental sealants[4] and to coat the inside of metallic cans.[5] Leaching of BPA into surrounding occurs due to presence of acidic food or beverages in cans or plastic containers. Heating of cans for food sterilization and repeated washings of plastic products increases the rate of leaching of this chemical into environment.

The major exposure is through BPA leaking into food and beverages.[6] It has been detected in over 90% of all analyzed human urine samples, showing its wide human exposure.[7] BPA has harmful effects on body organs like kidney, testes, prostate but liver is the main organ which is affected following an oral exposure. This causes production of Reactive Oxygen Species (ROS) and disturbs the activities of normal antioxidant enzymes such as catalase, glutathione peroxidase (Gpx), superoxide dismutase (SOD) and glutathione (GSH) in liver.[8] Many agents such as alcohol, viruses, fatty acids, drugs and immune response, can lead to intracellular stress through lysosomal and mitochondrial

1. Attya Zaheer
2. Anum Basit
3. Rukhsana Jabeen
4. Afifa Waseem
5. Zafar Iqbal
6. Rifat Shamim

1,4. Rashid Latif Medical College, Lahore
2. Ameer-u-Din Medical College, PGMI, Lahore
3. Niazi Medical and Dental College, Sargodha
5,6. Rai Medical College, Sargodha

Correspondence:
Dr. Attya Zaheer, *Assistant Professor, Rashid Latif Medical College, Lahore. Email: doctor_attya@yahoo.com*

Submission Date: 14-04-2021
1st Revision Date: 17-04-2021
Acceptance Date: 21-05-2021

dysfunction eventually leading to cell injury or death. Moringa oleifera (Mo) belongs to genus Moringacea and is commonly known by names Drumstick-tree or Horse radish-tree.[10] In Pakistan Mo is known by the name 'Suhannjana'. Several traditional systems of medicine in south Asia , use leaves of this marvelous tree in their medicinal recepies.[11] The leaves possess minerals like iron, calcium, vitamins, essential amino acids and many antioxidant compounds such as phenols and flavonoids.[12] These compounds scavenge free radicals, boost up the levels of other antioxidants and builds up the hepatoprotective activity in leaves.[13] Other traditional uses of the leaves are in healing skin infections, anxiety, asthma, wounds, fever, diarrhea, and sore throats. The Moringa Oleifera possess different pharmacological functions including anti-inflammatory, anti-ulcer, anti-cancer and anti-diabetic activity.[14] After an injury to the liver caused by some agent, the administration of Moringa leaves reduces the damaging effects and promotes formation of healthy tissue in liver.[15] This preventive effect of Mo have been studied with several hepatotoxicants such as drugs and chemicals and results were admirable. In a study, co-administration of MoLE with Diclofenac Sodium decreased the vascular congestion, promoted regeneration and decreased the levels of enzymes ALT and AST. The leaves are used as dietary supplements in Asia and are called mother's best friend as they increase the milk production during lactation. A study revealed that Moringa oleifera leaves exhibit higher antioxidant potential when compared with the plant's seed and root, as leaves possess high levels of flavonoids and phenolic acids.[16]

Methods

This was an experimental study conducted at the animal house of PGMI, Lahore. Thirty two albino rats of both sex, weighing 170-200 gms were procured from National Institute of Health, Islamabad. The male and female rats were housed in separate cages. They were kept at temperature of 28.0±2.0ºC under 12 hr light/dark cycles and were given rat diet and water ad libitum. After acclimatization for one week, 32 rats were divided through simple random sampling into 4 equal groups A, B, C and D (n=8) and weighed. Group A was control (received corn oil only) and rest of the groups were experimental. Dose of BPA and MoLE was prepared daily in corn oil and was given separately in single dose through oral route. Group B, received BPA only 50mg/kg/bw. Group C and D received BPA 50mg/kg along with MoLE 250mg/kg and 500mg/kg respectivley. BPA was acquired from Daejung–Korea and Moringa leaves were obtained from Botanical garden, University of the Punjab, Lahore, Pakistan. Ethanolic extract of Moringa leaves was prepared in PCSIR Laboratories Complex, Lahore.

Animals were sacrificed at end of the 7th week. All instruments needed for dissection were sterilized before dissection. Vertical and Transverse incision were made through skin and muscles. Liver was dissected out and washed with cold normal saline, blotted, and weighed with the help of an electronic weighing scale. Its macroscopic examination was carried out to note any gross abnormality. It was fixed with 10 % formalin. Tissue processing was done and paraffin embedded blocks were made. Tissue slides were stained with H&E and were observed under microscope. (Magnification: 10X and 20X)

Parameters

Quantitative:

- Diameter of central vein

Qualitative:

- Central vein congestion
- Portal triad congestion
- Sinusoidal congestion

Statistical Analysis

The data was analyzed by using SPSS 21. The quantitative data (central vein diameter) was measured by using micrometer and was presented in the form of Mean± standard deviation (S.D). ANOVA was applied to determine the statistical differences among groups. For comparison among groups, Post Hoc Tuckey was applied. A p-value of <0.05 was considered as statistically significant. For vascular congestion, five different fields were observed and the data was coded as: Absent = 0 and Present = 1. The qualitative data was presented in the form of frequency and percentages and was determined by applying Fischer's exact test.

Results

After 7 weeks of experiment, all animals remained active, had normal weight gain and no morbidity was observed. In control group "A", the central vein, portal vein and sinusoids did not show any change (Fig-1). However congestion was observed in these vessels in experimental groups "B" (Fig-2,3) which was then reduced in group "C" and "D" after administration of MoLE.

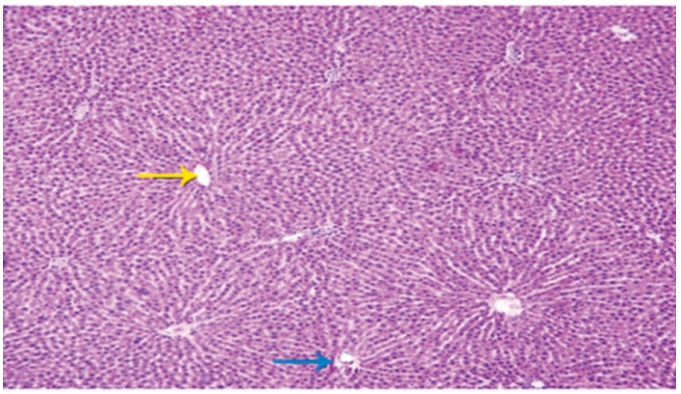


Fig.1: *Photomicrograph from Group A, Showing Normal Hepatic Lobules, Central Vein (yellow) and Portal Vein (blue). H&E Stain (10X)*

The diameter of central vein was compared in different groups by applying ANOVA. The group B had largest diameter while the group C and D had respectively smaller diameter than B. There was a significant difference among groups with p-value <0.001.

For comparison among groups, Post Hoc Tuckey was applied, it was observed that the group A had smaller diameter as compared to group B, C and D with p-values <0.001, 0.050 and 0.338 respectively.

Table 1: *Mean Diameter of Central Vein (µm) in Animals Groups*

Parameters	Groups				P-value (of comparison among groups)
	A Mean±SD	B Mean±SD	C Mean±SD	A Mean±SD	
Central vein diameter (µm)	101.8±13.5	212.1±39.5	155.4±49.3	33.4±44.6	<0.001

*p<0.05 is considered statistically significant.

The central vein congestion was present in 7(87.5%), 3(37.5%) and 2(25.0%) of animals in group B, C and D respectively. Fischer's exact test showed significant difference among groups with p-value 0.003 **(Fig: 1)**.

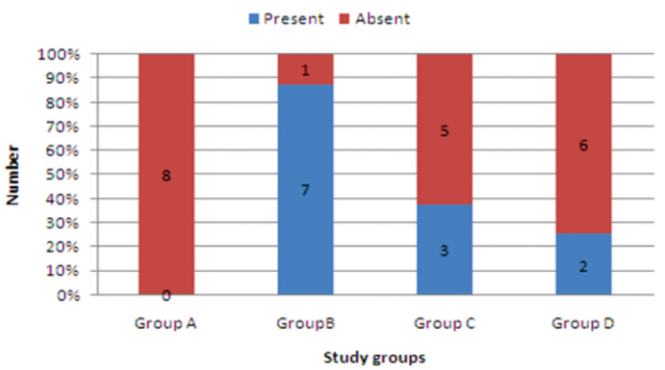


Fig-1: *Bar Chart Showing Status of Central Vein Congestion in Animals*

Portal vein congestion was present in all 8 animals of group B, 4(50.0%) and 3(37.5%) animals of group C and D respectively. Fischer's exact test showed significant difference among groups with p-value 0.004 **(Fig:2)**

Table 2: *Comparison of difference of Mean Central Vein Diameter Among Groups by Applying Post Hoc Tukey Test*

Group (I)	Group (J)	Mean Difference (I-J)	Std. Error	P-value
Group A	Group B	-110.38*	19.6	<0.001
	Group C	-53.63*	19.6	0.050
	Group D	-31.63	19.6	0.388
Group B	Group C	56.75*	19.6	0.035
	Group D	78.75*	19.6	0.002
Group C	Group D	22.00	19.6	0.680

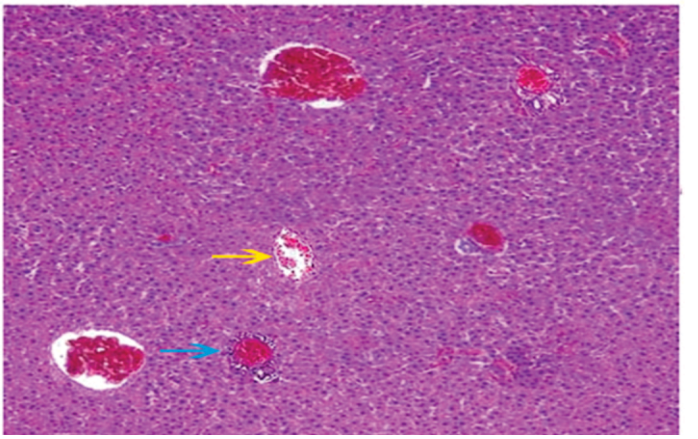


Fig-3: *Photomicrograph of Liver from Group B, Showing Congested Central Vein (Yellow Arrow) and portal vein (Blue arrow). H&E Stain (10X)*

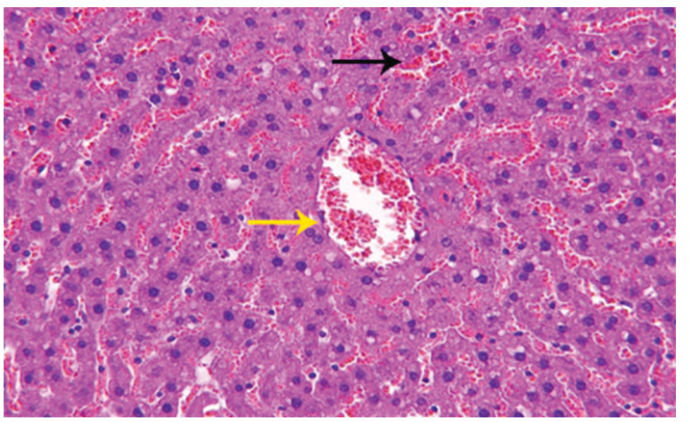


Fig-4: *Photomicrograph from Group B, Showing Congested Vessels. Central Vein (Yellow Arrow) and Sinusoids (Black Arrow). H&E Stain (20X)*

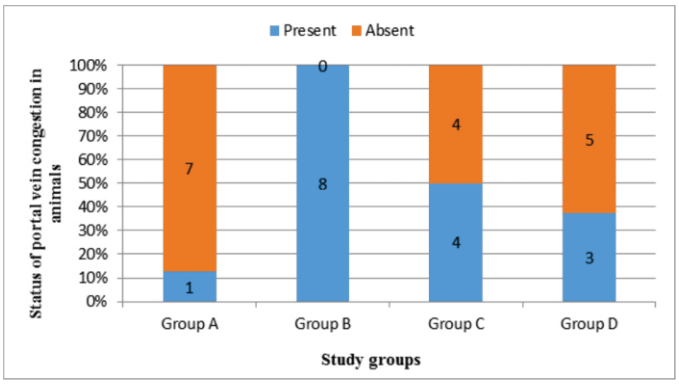


Fig-4: *Bar Chart Showing Status of Portal Vein Congestion in Animals of Each Group*

Discussion

BPA leads to the production of oxidative stress (ROS) in liver 8. ROS damages cell proteins, nucleic acids and lipids and impairs mitochondrial function, leading to cell damage.[9]

Moringa oleifera plant has high polyphenols and flavonoids content, which boosts up antioxidant status[15] and protects the cell membrane by augmenting protein synthesis and preventing lipid peroxidation.[17] The role of Moringa oleifera against oxidative stress in the heart of diabetic rats was also studied and a notable rise in levels of plasma insulin, superoxide dismutase (SOD) and catalase (CAT) and decrease in inflammatory changes were observed.[18] In another study after administration of Methotrexate, MO leaves reduced the inflammatory process and congestion in kidney and liver.[19]

Current study revealed congestion and dilatation of central vein (Pic 2&3). The diameter of central vein in group B was largest and in group D, it was close to Control group. However current study manifested a statistically significant decrease in mean diameters of central vein of group C and D after administration of MoLE **(Table-1)**.

Another study revealed that administration of BPA at dose of 50mg/kg resulted in congestion and dilatation of central vein[2] (**Fig.1**). Congestion in portal vein and sinusoids was also observed in group B (Fig-2,3; Fig 2). This could be attributed to reduced outflow of blood from a tissue. Congestion can be systemic, as observed in heart failure, or local, as in venous obstruction of an inflammed organ.[20] The oxidative stress produced due to BPA lead to failure of sodium pumps with water influx inside the cell which ultimately resulted in cellular swelling and injury. After an oral exposure to BPA, cytokines like IL-1beta and IL-6 are being released from the macrophages (Kupffer cells) of liver which further worsens the cell injury. These cellular changes may cause impaired venous drainage leading to congestion, as seen in group B. However in group C and D, this finding was reduced. The protective effect of Moringa leaves have been observed after administration of various hepatotoxicants like Carbon Tetrachloride and a decrease in inflammatory cell aggregates and congestion of blood vessel was reported.[13] Many studies have revelaed that the plant Moringa oleifera possess pharmacological activities and can be used for treatment of various diseases.[21]

Conclusion

Moringa oleifera leaves have protective effect on liver. It prevents the vascular congestion and dilatation induced by BPA. The healing effect improves as dose of Moringa is increased. These leaves can also be used as dietary supplement to improve the nutritional status.

References

1. Kadry E, El-shahat T, Mamdouh S, Magy A. Hepatoprotective effect of Moringa Oleifera leaves extract against Carbon Tetrachloride-induced liver damage in rats. World J Pharm Pharm Sci 2016; 5(5):76-89.
2. Hussein RM and Eid JI. Pathological mechanisms of liver injury caused by oral administration of Bisphenol A. Life Sci. J 2013; 10(1): 663-73.
3. Alazzouni A, Hassan NB. Evaluation of antiestrogen drug and stem enhance in amelioration of histopathological effects of Bisphenol A on vital organs in murine model: histological and immunohistochemical studies. Int J Pharm Bio Sci 2016; 7(2): 478-91.
4. Moon MK, Kim MJ, Jung IK, Koo YD, Park YJ. Bisphenol A impairs mitochondrial function in the liver at doses below the no observed adverse effect level. J Korean Med Sci 2012; 27(6): 644-52.
5. El-Dayem SM, Zaazaa AM, Foda FM, El Aty HE. Quercetin mitigates toxicity and oxidative stress motivated by Bisphenol A in liver of male rats. Int J Pharm Pharm Sci 2016; 8(7): 306-10.
6. Michael T, Liliana R, Ewa D, Andrzej W, Joanna W. Bisphenol A Causes Liver Damage and selectively alters the neurochemical coding of intrahepatic parasympathetic nerves in juvenile porcine models under physiological conditions. Int J Mol Sci. 2017; 18(12): 2726.
7. Bodin J, Bolling AK, Wendt A, Eliasson L, Nygaard UC. Exposure to Bisphenol A, but not phthalates, increases spontaneous diabetes type 1 development in NOD mice. Toxicol Rep 2015; 2(2015): 99-110.

8. Xia W, Jiang Y, Li Y, Wan Y, Chang H, Xu B, et al. Early-life exposure to Bisphenol A induces liver injury in rats involvement of mitochondria-mediated apoptosis. PloS one 2014; 9(2).
9. Wang K. Molecular mechanisms of hepatic apoptosis. Cell death dis 2014; 5(1).
10. Abd-Rani NZ, Husain K, Kumolosasi E. Moringa Genus: A Review of Phytochemistry and Pharmacology. Front Pharmacol 2018; 9(108).
11. Mashael MB, Attalla FE. The radioprotective effects of Moringa Oleifera against mobile phone electromagnetic radiation-induced infertility in rats. Int J Clin Exp Med 2015; 8(8): 12487-97.
12. Kou X, Li B, Olayanju JB, Drake JM, Chen N. Nutraceutical or Pharmacological Potential of Moringa oleifera Lam. Nutrients 2018;10(3):343.
13. Attia HA, Doaa S, Amany MM , Hassan MD , Mostafa AS. Phytochemical, antioxidant and hepatoprotective effects of different fractions of Moringa oleifera leaves methanol extract against liver injury in animal model. Asian Pac J Trop Med 2018; 11: 423-9.
14. Omodanisi EI, Aboua YG, Oguntibeju OO. Assessment of the anti-hyperglycaemic, anti-inflammatory and antioxidant activities of the methanol extract of moringa oleifera in diabetes-induced nephrotoxic male wistar rats. Molecules 2017; 22(4):439.
15. Omotoso BR, Abiodun AA, Ijomone OM and Adewole SO. Lead-induced damage on hepatocytes and hepatic reticular fibres in rats; protective role of aqueous extract of Moringa oleifera leaves (Lam). J Biosci Med 2015; 3(5): 27-35.
16. Xu YB, Chen GL and Guo MQ. Antioxidant and Anti-Inflammatory activities of the crude extracts of moringa oleifera from Kenya and their correlations with flavonoids. Antioxidants. 2019; 9;8(8):296.
17. Toson E, El-Bakry K, Serag MS and Aboser M. Hepatoprotective effect of Moringa oleifera leaves extract against carbon tetrachloride- induced liver damage in rats. World J Pharm pharm. Sci 2016; 5(5): 76-89.
18. Aju BY, Rajalakshmi SM. Protective role of Moringa oleifera leaf extract on cardiac antioxidant status and lipid peroxidation in streptozotocin induced diabetic rats. Heliyon 2019; 5(12).
19. Mohamed MS, Adel A, Mohamed AN, Fayez A and Wafaa AM. The ameliorative impacts of Moringa oleifera leaf extract against oxidative stress and methotrexate-induced hepato-renal dysfunction. Biomed & Pharmacother 2020; 128.
20. Kumar V, Abbas AK, Fausto N and Aster JC. Robbins and Cotran pathologic basis of disease 8th ed. Philadelphia: Elsevier Saunders; 2010.
21. Paikra BK, Dhongade HKJ and Gidwani B. Phytochemistry and Pharmacology of Moringa oleifera Lam. J Pharmacopuncture 2017; 20(3):194-200.

Authors Contributions

A.Z: Conceptualization of Project
A.B: Data collection
R.J: Literature Search
A.W: Statistical Analysis
Z.I: Drafting, Revision
R.S: Writing Manuscript

Clinical Spectrum and Risk Factors of Penile Fracture in a Tertiary Care Hospital, Pakistan

Ghulam Ghous,[1] Safia Bano,[2] Shahjehan,[3] Athar Mahmood,[4] Azfar Ali,[5] Irfan Sharif,[6] Muhammad Shahzad Anwar[7]

Abstract

Objective: To determine the clinical spectrum, operative findings, and determination of potential risk factors responsible for penile fracture.

Methods: A prospective, cross-sectional, observational study was done in the Department of Urology, Services Hospital Lahore. Study duration was two and half years from January 2018 to June 2020. A total of 18 patients were enrolled in study. Informed written consent was obtained from patients. Detail history, demographic data, presentation, risk factors and operative findings were recorded. No invasive investigations were done as the diagnosis was made clinically. Surgical repair was done in all patients.

Results: Patients age was 25-56 years (mean 33.78.6). All patients were married 18(100%). Majority of patients (61.1%) belonged to rural versus 7(38.9%) urban area. Mean time to present in urology was 7 hours ±5.5(range 2-24). Few 3(16.7%) went to general practitioner before urologist. 50% (9) reported heard a snap. Unilateral versus bilateral corporal injury was observed in 10 (55.6%) and 8(44.4%) respectively. Mid-corporal injury was observed in 6(33.3%), shaft in 4 (22.2%) and root of penis in 3 (16.7%). Urethral injury was reported in 4 (22.2%). Half of patients had eggplant deformity. Rolling sign was positive in 10(55.6%) followed by detumescence post-coitus (72.2%) of patients. Missionary style sex was common 12(66.6%) and one (5.6%) did not disclose information. 2(11.1%). penile fractures were due to masturbation and 3(16.7%) forceful blows to erect penis. Early presentation was in 14 (77.8%) varuses late in 3 (16.7%). 4 (22.2%) had delay due to behaviour. 10(55.6%) patients lived near to Hospital while 8(44.4%) lived far away. No use of medication for erectile dysfunction was reported. Mostly patients were middle -income class 6(33.3), low 10(55.6%) and 2(11.1%) higher income. 13 patients (72.2%) presented during summer as compared to 1(5.6%) in winter.

Conclusion: Missionary position was the most precarious position observed. The unilateral and mid-corporal injury was the most common operative finding.

Keywords: Penile fracture, corporal injury, urethral injury, eggplant plant deformity, detumescence, rolling sign

How to cite: *Ghous G., Bano S., Shahjehan., Mahmood A., Ali A., Sharif I., Anwar S.M. Clinical Spectrum and Risk Factors of Penile Fracture in a Tertiary Care Hospital, Pakistan. Esculapio 2021;17(02):152-156.*

DOI: ***https://doi.org/10.51273/esc21.251728***

Introduction

Penile fracture is an infrequent presentation in a urological emergency. The most common cause of fracture reported is sexual intercourse.[1] The incidence of penile fracture is uncertain even in emergency setting, varies among different populations depending upon sexual behaviour, ethnicity and other social norms.[2] Discussion about sexual practices is considered a taboo or a cause of an embarrassment in some societies, therefore, remain under-reported. Sex positions ("doggy style", "woman on top", rear-entry position, "man on top"), sharp below to the erect penis, traumatic aggressive masturbation or penile manipulation, deflating an erection are the reported risk factors.[3]

Fracture of the penis occurs when there is blunt trauma to the straight and rigid penis during sexual intercourse; when penis strikes with either symphysis pubis or perineum, or penile manipulation that instigates the

1. Ghulam Ghous
2. Safia Bano
3. Shahjehan
4. Athar Mahmood
5. Azfar Ali
6. Irfan Sharif
7. Muhammad Shahzad Anwar

1,4,6,7. Department of Urology, SIMS/SHL, Lahore
2. Department of Neurology, KEMU/MHL, Lahore
3. Department of Urology, FJMU, Lahore
5. Department of Urology, PGMI/LGH, Lahore

Correspondence:
Dr. Ghulam Ghous Assistant Professor of urology, Services Institute of Medical Sciences, Lahore.

Submission Date: 05-11-2020
1st Revision Date: 12-11-2020
2nd Revision Date: 15-01-2021
Acceptance Date: 02-01-2021

rupture of tunica albuginea of corpus cavernosum, which is quite thin during erection.[5] Rolling over in bed as a cause of injury has also been reported in the literature.[5] Clinical symptoms and signs demonstrated by patients include; excruciating pain, swelling due to hematoma formation, bruising, sudden audible click, immediate detumescence.[4] If penile fracture is accompanied by urethral injury (Suggested on history and clinical examination), haematuria, retention of urine followed by pain on urination is experienced by the patients.[6] Possible pathognomonic physical signs observed are; eggplant deformity; ecchymosis of the shaft, rolling sign; penile skin covering the hematoma over the site of rupture, tenderness of penis, flaccidity and curvature of a penis.[4] Urethral injury is seen even small amount of blood at meatus.[7] Surgical intervention is a fundamental treatment, should be done as early as possible. Delay in treatment can result in permanent sexual dysfunction, penile nodule, pain during sexual intercourse, penile chordee and urethral stricture.[8]

The main aim of this study to scrutinise the clinical spectrum, operative findings, and determination of potential risk factors. this study was done because of the rarity and under estimation of disease, data is relatively scarce on this topic.

Methods

A prospective, cross-sectional, observational study was conducted in the Department of Urology Services Hospital Lahore. Duration of study was two and a half years beginning from January 2018 till June 2020. A total of 18 patients were enrolled in this two-and-a-half-year study. The study was approved by the Ethical and review board of the Hospital. Informed written consent was obtained from all recruited patients. All patients with penile fracture were recruited in the study. A detailed history was taken from all patients about the event, the time has gone by since the onset and where did they seek treatment first. The demographic data, presenting symptoms and signs, and risk factors and operative findings were recorded on a predesigned Proforma. Proforma was filled out by researchers themselves. The diagnosis was made exclusively on clinical history and examination and later confirmed during surgery. No invasive investigations were carried out for diagnosis. Surgical repair was done in all patients with penile fracture.

Data were analysed using SPSS version 20.0. Quantitative variables such as Patient's age, onset to presentation time in hours is presented as mean and standard deviation. Demographics, Clinical findings, operative findings, education status, and risk factors are presented as frequency and percentage.

Results

The age ranged between 25-56 years of subjects (mean 33.7±8.6) All patients recruited were married 18(100%). Majority of patients (61.1%) were from a rural area and only 7(38.9%) were from the urban area.

Mean of time from onset of trauma to presentation in the urology department was 7 hours ±5.5 (range 2-24 hours).

Majority of patients and their wives were illiterate 4(22.2%) and 6(33.3%), respectively. Primary passed males were 3(16.7%) females 2(11.1%). Middle passed were 2 (11.1%) and females 2 (11.1%) , matric passed were 3(16.7%) and females 2(11.1%) , intermediate passed were 2(11.1%) and females 2(11.1%), graduates were 3(16.7%) males and 2(11.1%) females, and 1(5.6%) males and2 (11.1%) females had master's degree.

44.4% (n=8) of patients presented in urological emergency whereas, 7(38.9%) presented in a surgical emergency. Few 3(16.7%) went to see general practitioner before transfer to urology.

Half (50%) of patients had eggplant deformity on clinical examination. Rolling sign was positive in 10(55.6%) of subjects. Detumescence post-coitus was reported by most (72.2%) of the patients. Most common position reported by patients was "missionary style" or "man on top" sex position in 66.6% (n=12) and one (5.6%) subject did not disclose the information. 2(11.1%) experienced penile fracture during masturbation and 3(16.7%) of patients experienced a forceful blow to the erect penis. 50% (9) of subjects reported having heard a snap. None of the patients had erectile dysfunction and reported use of medication for sexual dysfunction before the presentation.

Unilateral and bilateral injury of corpora was observed in 10 (55.6%) and 8(44.4%), respectively. The mid-corporal injury was observed the most 8(44.4%) followed by shaft 4 (22.2%) and roof of penis 3 (16.7%). The right corporal injury was in 8(44.4) and left as 2(11.1) The urethral injury was reported in only 4 (22.2%) of cases. Microhaematuria was observed in 2(11.1%) and macrohematuria in 2(11.1%) and urinary retention was reported by all patients with urethral injury.

The referral was made early in 14 (77.8%) while late

in 3 (16.7%). 2 (11.1%) had to delay because of Behaviour and only 1(5.6%) reported delay caused by attitude. 10(55.6%) patients lived near to the tertiary care Hospital while 8(44.4%) lived far.

There was a preponderance of middle -income class 6 (33.3%), and the low-income family was 10(55.6%), and only 2(11.1%) subjects belonged to higher socioeconomic status.

Seasonal variation is described in **Table-1**.

Table 1: *Patients characteristics*

Variables	Years (range)
Age	25-56(33.7±8.6)
Marital Status	**N (%)**
Married	18(100%)
Unmarried	0
Residence	
Rural	11(61.1%)
Urban	7(38.9%)
Education of Patient	
Illiterate	4(22.2)
Primary	3(16.7%)
Middle	2(11.1)
Matric	3(16.7)
Intermediate	2(11.2)
Graduate	3(16.7%)
Masters	1(5.6%)
Education of Wife	
illiterate	6(33.4%)
Primary	2(16.7%)
Middle	2(11.1%
Matric	2(11.1%)
Intermediate	2(16.7%)
Graduate	2(11.1%)
Masters	2(11.1%
Mechanism of injury	N (%)
Sexual intercourse	
Missionary, man on top position	12(66.6%)
Penile manipulation	2(11.1%)
Forceful blow	3(16.7%)
Unclear	1(5.6%)
Clinical Findings	**N (%)**
Eggplant deformity	9(50%)
Rolling sign	10 (55.6%)
Immediate Detumescence	13(72.2%)
Audible click	8(44.4)
Operative Finding	**N (%)**
Corporal injury	
Unilateral	10 (55.6%)
Bilateral	8(44.4%)
Location of injury	
Mid-corpora	8(44.4)
Shaft	4(22.2%)
The roof of the penis	3(16.7%0
Mid-shaft	2(11.1%)
Superficial skin tear	1(5.6%)
Urethral injury	4(22.2%)
Season	
Summer	13(72.2%)
Winter	1(5.6%)
Rainy/Pleasant	4(44.4%)
Spring	0

Discussion

Penile fracture is a misnomer, it is a rupture of tunica albuginea of corpus cavernosum. Rupture of albuginea may be accompanied by a tear of the deep dorsal vein, however; it is an infrequent complication.[9] Typical clinical findings and presentation is usually an exemption of supplementary invasive investigations.[10]

Majority of patients presented were married, from a rural area, belonged to low socioeconomic status, and were un-educated. Therefore, it can be inferred that the lack of education among patients is associated with this condition. In a study by Rooh-ul-Muqim et al had a significant number of (58.8%) patients from rural area same as our study.[11] However, the lack of sex education due to cultural prohibitions and shyness may also be a contributing factor as illustrated by Naouar et al.[12]

Majority of our patients presented directly in a urological emergency. Few patients went to seek care from GP. That may be due to paucity of awareness among patients about where to seek care in circumstances like these. No data was found on the literature review regarding the first presentations of this condition to compare our results. More than half of the subjects presented early in hospital, whereas only 16.7% of patients presented late. Delay in seeking medical treatment in our study was due to the fear of humiliation and shame in 11%. The reason for delayed presentation in 44% was due to the unavailability of the health-care facility that deals with urological emergencies. Early presentation and surgical intervention are associated with a lower risk of complications compared to late presentation.[5,12]

Sexual intercourse has been reported to be the most common reason stated of this entity in literature.[1] The most common position described in our cohort was a man on top or missionary style sex position. In contrast, a study done by Barros et al reported "doggy-style" position to be a riskier position to fracture a penis than a "man on top" position and was associated with bilateral fractures of corpus cavernosum.[12] Whereas, frac-

ture due to penile manipulation and forceful blow were similar as stated by malik et al in 2002 done in chandka medical college[13] The predisposing causes depicted in our study are similar to that are ascribed in literature.

Clinical findings displayed in our subjects were the same as the findings reported by Frirdi et al in three case reports and literature review study.[14] Instant detumescence was most frequently reported by our patients. Eggplant deformity as evident by swelling and ecchymosis and Rolling sign marked by rolled skin over the clot, hence the name rolling sign[4] were observed in almost half of our cohort.

Urethral ruptures are unusual and occur in only 10-20% of patients and are generally associated with bilateral corporal body injury.[15] The urethral injury was observed in 22% of our patients and manifested with either microhaematuria 2(11.1%), macrohematuria 2(11.1%) or retention of urine in 4(44.4%). Attam Amit et al reported a 24% incidence of urethral injury with a penile fracture.[16]

Middle corporal body injury was largely observed in our study in approximately 70% of patients. Shaft injury was the second most common approximately 22.2%. In a study done by Wani, proximal corporal injury[17] was reported in the majority of cases with 63.4%. The right-sided tear was more common than left in our study, a finding analogous to reported by Satyendra Persaud et al.[18]

We observed an increased influx of patients during the summer months. one study reported a greater number of patients during summer months akin to our study.[19] On the contrary, a study by Moslemi et al described an increased incidence of patients presenting with penile fracture during spring.[20]

Conclusion

In conclusion, several risk factors can lead to this dramatic malady. Education about sex and spreading awareness of risk factors and guidance regarding where to seek medical assistance in this crisis among people is a plausible way to mitigate the problem.

Limitations of the Study

There are few limitations to our study such as smaller sample size and absence of investigations in patients with urethral injury.

Conflicts of Interest: None

References

1. Diaz KC, Cronovich H. Penis Fracture. [Updated 2020 May 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-.
2. Rodriguez D, Li K, Apoj M, Munarriz R. Epidemiology of Penile Fractures in United States Emergency Departments: Access to Care Disparities May Lead to Suboptimal Outcomes. J Sex Med. 2019 Feb;16(2):248-256. doi: 10.1016/j.jsxm.2018.12.009. PMID: 30770071.
3. Barros R, Schulze L, Ornellas AA, Koifman L, Favorito LA. Relationship between sexual position and severity of the penile fracture. Int. J. Impot. Res. 2017 Sep; 29(5): 207-209.
4. Mahapatra RS, Kundu AK, Pal DK. Penile Fracture: Our Experience in a Tertiary Care Hospital. World J Men's Health. 2015;33(2):95-102. doi: 10.5534/ wjmh. 2015.33.2.95
5. Aman Z, Qayyum A et al. Early surgical intervention in penile fracture. J postgrad Med Inst 2004; 18(3): 432-8
6. Kasaraneni P, Mylarappa P, Gowda RD, Puvvada S, Kasaraneni D. Penile fracture with urethral injury: Our experience in a tertiary care hospital. Arch Ital Urol Androl. 2019 Jan 17;90(4):283-287. doi: 10.4081/ aiua. 2018.4.283. PMID: 30655641.
7. Mathew J, Parmar K, Chandna A, Kumar S. Penile fracture associated with complete urethra and bilateral corpora cavernosa transection. Ann R Coll Surg Engl. 2021 Mar;103(3):e88-e90. doi: 10.1308/ rcsann.2020. 7042. PMID: 33645282.
8. Amer T, Wilson R, Chlosta P, AlBuheissi S, Qazi H, Fraser M, Aboumarzouk O, M: Penile Fracture: A Meta-Analysis. Urol Int 2016;96:315-329. doi: 10.1159/ 000444884
9. Faydaci G, Ozgul A, Kuyumcuoglu U, et al. Dorsal vein rupture after the practice of taqaandan, necrotizing cavernositis, penile reconstruction, urethroplasty and penile prosthesis implantation. Andrologia. 2012; 44 (Suppl 1):851–5. doi: 10.1111/j.1439-0272.2011. 01259. x. Epub 2011 Dec 18
10. Mahapatra RS, Kundu AK, Pal DK. Penile Fracture: Our Experience in a Tertiary Care Hospital. World J Men's Health. 2015;33(2):95-102. doi: 10.5534/ wjmh. 2015.33.2.95
11. Rooh-ul-Muqim, Qutb-e-Alam Jan MANAGEMENT OF PENILE FRACTURE Pak J Med Sci January-March 2006 Vol. 22 No. 1 23-27
12. Naouar S, et al. Management of penile fracture: Can it wait? Afr J Urol (2017), https://doi.org/10.1016/ j.afju. 2017.07.006
13. Barros R, Schulze L, Ornellas AA, Koifman L, Favorito

LA. Relationship between sexual position and severity of the penile fracture. Int J Impot Res. 2017 Sep; 29(5): 207-209. doi: 10.1038/ijir.2017.24. Epub 2017 Jun 29. PMID: 28659630

14. MH Jalabani, Fracture of the penis The Professional 2002 Jun; 9(3)
15. Faridi MS, Agarwal N, Saini P, Kaur N, Gupta A. Myriad presentations of penile fracture: report of three cases and review of the literature. J Family Med Prim Care. 2015;4(2):273-275. doi:10.4103/2249-4863.154674
16. Boncher NA, Vricella GJ, Jankowski JT, Ponsky LE, Cherullo EE. Penile fracture with associated urethral rupture. Case Rep Med. 2010; 2010:791948. doi: 10. 1155/2010/791948
17. Amit A, Arun K, Bharat B, Navin R, Sameer T, Shankar DU. Penile fracture and associated urethral injury: Experience at a tertiary care hospital. Can Urol Assoc J. 2013;7(3-4): E168-E170. doi:10.5489/cuaj.475
18. Wani I. Management of penile fracture. Oman Med J. 2008;23(3):162-165
19. Satyendra Persaud,1 Maliza Persaud,2 Vijay Narayn-singh Fracture of Penis: A Review, EMJ Urol. 2019; 7[1]: 83-88]
20. Pariser JJ, Pearce SM, Patel SG, Bales GT. National Patterns of Urethral Evaluation and Risk Factors for Urethral Injury in Patients with Penile Fracture. Urology. 2015 Jul;86(1):181-5.
21. Moslemi MK. Evaluation of epidemiology, concomitant urethral disruption and seasonal variation of penile fracture: A report of 86 cases. Can Urol Assoc J. 2013;7(9-10): E572-E575. doi:10.5489/cuaj.179

Authors Contribution

G.G: Conceptualization of Project

S.B: Statistical Analysis, Writing Manuscript

S.J: Date Collection

A.M: Date Collection

A.A: Date Collection

I.S: Date Collection

M.S.A: Supervise, Drafting, Revision

Diagnostic Accuracy of Cardiotocography in Determining Good and Poor Apgar Score After Fetus Delivery

Saba Irshad,[1] Sadia Ghafar,[2] Muhammad Kalim Akhter,[3] Tayyeba Komal,[4] Sami Ullah Mumtaz,[5] Muhammad Furqan Saeed[6]

Abstract

Objective: To determine the diagnostic accuracy of Cardiotocography in determination of good and poor Apgar score after delivery of fetus at term.

Methods: This was a cross sectional study done at Obstetrics & Gynecology department, Lady Atchison hospital, Lahore for 6 months, after ethical approval of study. 448 cases were included through non-probability consecutive sampling method. Initial CTG monitoring was done and normal and abnormal CTG was labeled. After delivery of baby, assessment for Apgar score was done. The good and poor Apgar score was labeled and the findings were co-related with the CTG findings. A proforma was specifically designed to record findings of this study. Data was analyzed by using SPSS 16. The sensitivity, specificity, Positive & Negative Predictive Values and diagnostic accuracy of abnormal CTG were calculated by taking Apgar score at birth as gold standard.

Results: The mean age of the patients was 30.42±5.73 years. The mean gestational age was 38.20±1.10 weeks. The mean Apgar score after 5 minutes of birth was 6.67±1.67. There were 183 (40.8%) females who had abnormal CTG while 265 (59.2%) females had normal CTG. The sensitivity, specificity, PPV, NPV and diagnostic accuracy of CTG at birth were 65.9%, 51.4%, 67.9%, 49.2% and 60.3% respectively.

Conclusion: CTG is a good screening tool to assess mother & fetus wellbeing but it is not a diagnostic tool for fetal surveillance in females undergoing delivery at term.

Key words: Cardiotocography, Apgar score, Birth, Gestational Age, Diagnostic Accuracy, Third Trimester.

How to cite: *Irshad S., Akhter K.M., Komal T., Saeed F.M., Mumtaz U.S., Waheed I., Kausar S., Hamid H.M. Diagnostic Accuracy of Cardiotocography in Determination of Good and Poor Apgar Score After Delivery of Fetus at Term. Esculapio 2021;17(02):157-160.*

DOI: *https://doi.org/10.51273/esc21.251729*

Introduction

Cardiotocography (CTG) is a non-invasive tool to record fetal cardiac activity and uterine muscle contractions during the third trimester of pregnancy.[1,2] It is most commonly used technique to evaluate mother & child wellbeing during pregnancy.[3]

The technique of CTG monitoring assesses fetal cardiac abnormalities during intrauterine life & while birth & this early diagnosis of fetal hypoxia results in early handling of the labor & hence better mother & child health.[4] One very important use of this tool is to give extra care to such short of oxygen babies during cesarean section or assisted labor.[5] This fetal monitoring for hypoxia has saved many precious lives.[6]

In developed countries, majority of the mother & child hospitals are using this tool for the assessment of fetal wellbeing.[7] In a study of 217 patients of cesarean section, out of all patients with fetal distress, APGAR score was <7 in only 33 (15.2%) babies after 5 minutes of delivery.8In another study reported that sensitivity of CTG was higher i.e. 96.2% but specificity was only 8.3% for 5-min Apgar score.[9]

The CTG performance, monitoring & interpretation are observer dependent. A normal test shows a healthy non-hypoxic fetus while an abnormal test shows a

1. Saba Irshad
2. Sadia Ghafar,
3. Muhammad Kalim Akhter
4. Tayyeba Komal
5. Sami Ullah Mumtaz
6. Muhammad Furqan Saeed

1. Obstetrics & Gynecology, Lady Atchison Hospital, Lahore
2. Fatima Memorial Hospital, Lahore.
3-6: King Edward Medical University, Lahore.

Correspondence:
Dr. Tayyeba Komal, *PGR Microbiology, King Edward Medical University Lahore. Email id: drtksami@gmail.com*

Submission Date: 08-03-2021
1st Revision Date: 17-03-2021
Acceptance Date: 14-04-2021

possible fetal distress & hypoxia at or before term. Therefore careful handling of the device is very important.[10]

The Apgar score is an instant method to assess fetus wellbeing just after birth and to see response of resuscitation if required. It includes fetus respiratory effort, reflexes, muscle tone, heart rate & color. It is used to assess hemodynamic status of fetus. It is done at 1 and 5 minutes after birth & can be done at 5 minutes intervals if baby scores <7 at 5 minutes or who need resuscitation. A score of 7 or above is taken as good.[11-13]

The rationale of project was to find out the diagnostic accuracy of Cardiotocography in determination of good and poor Apgar score after delivery of fetus at term. This technique is used in routine to determine fetal wellbeing and to decide the route of delivery because of its non-invasive and cost effective properties. But CTG often indicates the abnormal fetal condition which results in excessive numbers of cesarean section, however, fetus is found normal and healthy after birth. In this study we wanted to confirm that either we can rely on this technique or not in future taking a larger sample size.

Methods

This was a Cross sectional study done at Obstetrics & Gynecology department, Lady Aitchison hospital, Lahore forSix months from date of ethical approval of study. 448 booked laboring females of age 20-40 years with singleton pregnancy, cephalic presentation and term pregnancy (37 completed week diagnosed by LMP) having parity<6 were included in the study by non-probability consecutive sampling. Sample size was estimated by using 95% confidence level, with expected sensitivity 96.2% with 3% margin of error, 8.3% specificity with 3% margin of error taking expected prevalence of poor Apgar score as 15.2%. Patients with history of previous cesarean section, multiple pregnancies, gestational diabetes, pregnancy induced hypertension, antepartum hemorrhage, intrauterine growth restriction &prolong pregnancy were excluded. Informed written consent was taken from each patient. A detailed demographic history (name, age, gestational age, parity) was taken. Initial CTG monitoring was done for 20 minutes. It was labeled as normal if basal heart rate 110–160 beats/min, beat to beat variability 5–25 beats/min with at least two accelerations and abnormal if fetal heart rate was beyond 110-160 beats/min, reduced or absent beat to beat variability with variable decelerations. In case of poor progress of labour with abnormal CTG findings, cesarean section was performed otherwise normal labor was followed. After delivery of baby, assessment for Apgar score was done i.e. birth score at 5 minute after delivery. Score of >6 (out of 10) was considered as good and score of <6 was considered as poor and the findings were co-related with the CTG findings. It was labeled as true positive if CTG was normal and also baby had good Apgar score after 5min, true negative if CTG was abnormal and also baby had poor Apgar score after 5min, false positive if CTG was normal but baby had poor Apgar score after 5min &false negative if CTG was abnormal but baby had good Apgar score after 5min.A proforma was specifically designed to record findings of this study. Data was analyzed by using SPSS 16. Quantitative variables like gestational age, apgar score & age were presented as Mean±SD. Qualitative variables like parity were presented as frequency and percentage. The sensitivity, specificity, Positive & Negative predictive values and diagnostic accuracy of CTG was calculated by generating 2/2 table.

Results

The mean age of the patients in our study was 30.42 ± 5.73 years. The mean gestational age was observed as 38.20 ± 1.10 weeks. There were 97 (21.7%) female who were nulliparous, 102 (22.8%) had para 1, 156 (34.8%) had para 2, 75 (16.7%) had para 3 and 18 (4.0%) had para 4. There were 183 (40.8%) female who had abnormal CTG while 265 (59.2%) females had normal CTG. The mean Apgar score of neonates after 5 minutes of birth was observed as 6.67±1.67 with minimum Apgar score of 4 and maximum Apgar score of 9. There were 66 (14.7%) neonates with score 4, 74 (16.5%) had score 5, 35 (7.8%) had score 6, 113 (25.2%) had score 7, 88 (19.6%) had score 8 and 72 (16.1%) neonates had Apgar score of 9. **Table 1**

There were 273 (60.9%) neonates who had good Apgar score while 175 (39.1%) had poor Apgar score. **Fig 1**

Among 273 neonates who had good Apgar score, 180 (65.9%) had normal CTG while 93 (34.1%) had abnormal CTG. Among 175 neonates who had poor Apgar score, 85 (48.6%) had normal CTG while 90 (51.4%) had abnormal CTG. The sensitivity, specificity, Positive & Negative Predictive Values and diagnostic accuracy of C TG was65.9%, 51.4%, 67.9%, 49.2% and 60.3%

respectively. **Table 2**

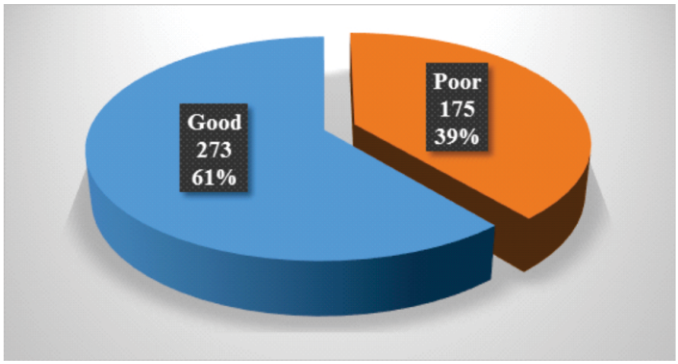


Figure-1: *Distribution of Neonates According to Apgar Score*

Table 1: *Baseline Characteristics of Pregnant Females*

n	448
Age (Years)	30.42 ± 5.73
Gestational Age	38.20 ± 1.10
Primigravida	97 (21.7%)
Parity 1	102 (22.8%)
Parity 2	156 (34.8%)
Parity 3	75 (16.7%)
Parity 4	18 (4.0%)
CTG	
Normal	265 (59.2%)
Abnormal	183 (40.8%)
Apgar score	6.67 ± 1.67
Apgar score	
4	66 (14.7%)
5	74 (16.5%)
6	35 (7.8%)
7	113 (25.2%)
8	88 (19.6%)
9	72 (16.1%)

Table 2: *Comparison of Predictive Values (Bishop Score vs. Cervical Length)*

		Apgar score		Total
		Good	Poor	
CTG	**Normal**	180 (65.9%)	85 (48.6%)	265 (59.2%)
	Abnormal	93 (34.1%)	90 (51.4%)	183 (40.8%)
	Total	273 (100%)	175 (100%)	448 (100%)

Sensitivity65.9%, Specificity 51.4%, PPV 67.9%, NPV49.2%, Diagnostic accuracy 60.3%

Discussion

In this study we found abnormal CTG in 183 (40.8%) females while 265 (59.2%) females had normal CTG. After delivery of baby, in our study, 273 (60.9%) neonates had good Apgar score (>6) while 175 (39.1%) had poor Apgar score (<6) at 5 minutes of birth. The sensitivity, specificity, PPV & NPV were 65.9%, 51.4%, 67.9% and 49.2% respectively with an overall diagnostic accuracy of CTG of 60.3%. The CTG performance, monitoring & interpretation are observer dependent. A normal test shows a healthy non-hypoxic fetus while an abnormal test shows a possible fetal distress & hypoxia at or before term. Therefore careful handling of the device is very important.[14]

Sultana and her colleagues did a similar study on CTG & found that the sensitivity, specificity, PPV & NPV was 87%,66%,54% & 92% respectively. Hence normal CTG is more conclusive of normal fetus & labour than that of abnormal CTG for abnormal fetus & labour.[15] CTG basically monitors fetal wellbeing. It records fetal heart beat & uterine contractions & produces a paper recording of both. Hence it's an easy & affordable measure of both fetal & mother health.[16]

Aboulghar et al., conducted a study and found the sensitivity of CTG was very much higher i.e. 96.2% but specificity was only 8.3% for 5min Apgar score which was far low and similar as found in our study as well as reported by other previous studies.[9]

In a local study, Khursheed, Das and Jatoi found that the sensitivity and specificity of CTG for poor Apgar score was 53.22% and 69.02%. They concluded that CTG is a good tool to monitor fetal wellbeing. However, it need to be standardized to reduce the incidence of false positive results that result in increased number of caesarean section.[17]

Conclusion

CTG is a good screening tool to assess mother & fetus wellbeing but it is not a diagnostic tool for fetal surveillance in future in females undergoing delivery at term without any pregnancy related complication. It is further suggested that more diagnostic tools and approaches should be evaluated in future to assess health of mother and neonates.

Conflict of interest: None

References

1. Alfirevic Z, Gyte GM, Cuthbert A, Devane D. Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for fetal assessment during labour. Cochrane database of systematic reviews

2017(2).
2. Pinas A, Chandraharan E. Continuous cardiotocography during labour: Analysis, classification and management. Best practice & research Clinical obstetrics & gynaecology 2016;30:33-47.
3. Chamidah N, Wasito I, editors. Fetal state classification from cardiotocography based on feature extraction using hybrid K-Means and support vector machine. 2015 international conference on advanced computer science and information systems (ICACSIS); 2015: IEEE.
4. Panda S, Das A, Nowroz H, Singh A. Role of admission tests in predicting perinatal outcome: a prospective study. J Preg Child Health 2015;2(171):2.
5. Fergus P, Selvaraj M, Chalmers C. Machine learning ensemble modelling to classify caesarean section and vaginal delivery types using Cardiotocography traces. Computers in biology and medicine 2018;93:7-16.
6. Chetandas P, Zahiruddin S, Jabeen N, Baloch R, Shaikh F. Increasing rate of Caesarean Section Due to Non-Reassuring Cardiotocography. Open Journal of Obstetrics and Gynecology 2017;7(3):351-7.
7. Ražem K, Kocijan J, Podbregar M, Lučovnik M. Near-infrared spectroscopy of the placenta for monitoring fetal oxygenation during labour. PloS one 2020; 15(4): e0231461.
8. Roy K, Baruah J, Kumar S, Deorari A, Sharma J, Karmakar D. Cesarean section for suspected fetal distress, continuous fetal heart monitoring and decision to delivery time. The Indian Journal of Pediatrics 2008; 75(12):1249-52.
9. Aboulghar W, Ibrahim M, Allam I, Hosny W, Otify M. Validity Of Cardiotocography In The Diagnosis Of Acute Fetal Hypoxia In Low Resources Settings. Internet Journal of Gynecology & Obstetrics 2013; 17(1).
10. Grivell RM, Alfirevic Z, Gyte GM, Devane D. Antenatal cardiotocography for fetal assessment. Cochrane Database of Systematic Reviews 2015(9).
11. Vuralli D. Clinical approach to hypocalcemia in newborn period and infancy: who should be treated? International journal of pediatrics 2019;2019.
12. Goswami IR, Whyte H, Wintermark P, Mohammad K, Shivananda S, Louis D, et al. Characteristics and short-term outcomes of neonates with mild hypoxic-ischemic encephalopathy treated with hypothermia. Journal of Perinatology 2020;40(2):275-83.
13. Odintsova VV, Dolan CV, Van Beijsterveldt CE, De Zeeuw EL, Van Dongen J, Boomsma DI. Pre-and Perinatal Characteristics Associated with Apgar Scores in a Review and in a New Study of Dutch Twins. Twin Research and Human Genetics 2019;22(3):164-76.
14. Grivell R, Alfirevic Z, Gyte G, Devane D. Cardiotocography (a form of electronic fetal monitoring) for assessing a baby's well-being in the womb during pregnancy. 2010.
15. Sultana J, Chowdhury T, Begum K, Khan M. Comparison of normal and abnormal cardiotocography with pregnancy outcomes and early neonatal outcomes. Mymensingh medical journal: MMJ 2009;18(1 Suppl): S103-7.
16. Alfirevic Z, Devane D, Gyte GML. Comparing continuous electronic fetal monitoring in labour (cardiotocography, CTG) with intermittent listening (intermittent auscultation, IA). Cochrane Summaries; 2013 [cited 2021]; Available from: summaries.cochrane.org/Cd006066/comparing-continuous-electronic-fetal-monitoring-in-labour-cardiotocography-ctg-with-intermittent-listening-intermittent-auscultation-ia.
17. Khursheed F, Das CM, Jatoi N. Cardiotocography: Obstetric and Neonatal out come. J Rawal Med Coll 2009;13(2):86-8.

Authors Contribution

S.I: Manuscript writing & approval
M.K.A: Study Design
T.K, M.F.S, I.W: data collection
S.Ul.M: data interpretation
S.K: Study design, Data collection
M.H.H: Study design, data analysis

Mean Platelet Volume, Immature Platelet Fraction and Beta Thromboglobulin in Acute Coronary Syndrome Patients

Sadia Ijaz,[1] Muhammad Muzammil Bajwa,[2] Hafiz Ather,[3] Faiza Wattoo,[4] Tabinda Roheen,[5] Khadija Saleem[6]

Abstract

Objective: Conventionally troponin and iso-enzymes of creatinine kinase are used for risk stratification and diagnosis of cardiac diseases. Our objective is to compare the levels of mean platelet volume (MPV), immature platelet fraction (IPF) and beta thromboglobulin level (BTL) in healthy individuals and patients of acute coronary syndrome to discover parameters which can be used to design strategies of risk stratification, early diagnosis, timely management and prophylaxis.

Methods: The 170 study participants were divided into two groups, Cases (85) and Controls (85). The required parameters MPV and IPF were evaluated using sysmex XN 1000 where as BTL were assessed using ELISA technique. Mean ± Standard Deviation and Median ± Inter Quartile Range was used for quantitative data. Independent sample t-test was applied to compare mean of normally distributed data. Mann Whitney U test was applied to compare median of non-normal data. P-value ≤0.05 was considered significant.

Results: Mean IPF in cases and control was 8.716±6.2834 (%) and 3.83±1.63% respectively with statistically significant high levels in cases. MPV (fL) in cases was 11.65±1.53 and in controls was 10.74 ± 1.04, with statistically significant higher value in cases. Mean BTL (ng/ml) in cases was also statistically higher i.e. 28.35±17.83 versus 14.28±5.80.

Conclusion: The study concluded that levels of MPV, IPF and BTL were normal among controls while raised levels of IPF and BTL were observed among cases.

Key Words: Mean platelet volume, immature platelet fraction, Beta thromboglobulin, Acute coronary syndrome.

How to cite: *Ijaz S., Bajwa M.M., Ather H., Wattoo F., Roheen T., Saleem K. Mean Platelet Volume, Immature Platelet Fraction and Beta Thromboglobulin in Acute Coronary Syndrome Patients. Esculapio 2021;17(02):161-165.*

DOI: ***https://doi.org/10.51273/esc21.2517210***

Introduction

Cardiovascular diseases are major cause of death around the world.[1] Among them, acute coronary syndrome (ACS) is the leading cause of morbidity and mortality. ACS accounts for first presentation of coronary vessel diseases and is a broader term used for describing signs and symptoms of cardiac ischemia.[2] On the basis of signs and symptoms, ECG findings and certain laboratory parameters ACS can be sub-grouped as ST-segment elevation myocardial infarction, non-ST-segment elevation myocardial infarction and unstable angina often necessitating endovascular or open interventions to avoid fatal events like cardiogenic shock causing sudden arrest of cardiac activity further leading to death.[3,4] Amongst today's challenges, the major goal is to design such strategies which can prevent the occurrence of adverse coronary events and identify the individuals who are at greater risk of occurrence of ACS.[5]

Cardiac troponins and iso-enzymes of creatine kinase are routine investigations which are being used for the diagnosis of ACS. Troponin is the most sensitive, specific and reliable cardiac marker and is being currently used as gold standard investigation for the diagnosis and risk stratification in ACS patients. However, it remains undetectable in 40 – 60% of the patients

1. Sadia Ijaz
2. Muhammad Muzammil Bajwa
3. Hafiz Ather
4. Faiza Wattoo
5. Tabinda Roheen
6. Khadija Saleem

1,2. Lahore General Hospital
3 Gujranwala Medical College
4-6: University Medical and Dental College

Correspondence:
Sadia Ijaz, Medical Officer, Lahore General Hospital.
Email: mujibajwa@gmail.com

Submission Date: 17-04-2021
1st Revision Date: 22-04-2021
Acceptance Date: 26-05-2021

who are suffering from ACS. Platelet indices are more reliable and accurate tool, as a new cardiac biomarker, of cardiovascular events and can potentially be used for the risk stratification of cardiovascular diseases.[6] The biological functions of platelets have now been extended far more than the traditional homeostasis and thrombotic events.[6] Platelets are now being considered as a source of inflammatory mediators, which are being guarded by their contact with arterial surfaces. Activated platelets release inflammatory mediators which further leads to platelet adhesion. The atherothrombotic potential of platelets causes release of further mediators which leads to activation of the inflammatory process and propagation of coronary vessel thrombosis predisposing to the thrombotic events.

Platelets vary in properties like size, density, and activity. Variations in these parameters can be associated with the initial triggering factor of ACS. Platelets which are large in size have stronger adhesion potential and aggregating effect than the platelets with smaller size. Increase in volume of platelets is associated with increased prothrombotic potential of atherosclerotic plaque in ACS and is a risk factor for thrombus formation in coronary vessels in patients of AMI.

MPV is a component of CBC and is commonly used as most reliable index for the platelet size identification and the status of its activation. An increase in MPV is associated with various cardiovascular risk factors and comorbidities like DM, hypertension, hypercholesterolemia, and obesity.

The above facts and observations have led to the hypothesis that increased MPV in subjects can be a beneficial tool in risk stratification of cardiovascular effects. As MPV is thought to be a marker of the size of platelets and consequently correlates with the activation status of platelets. The increase MPV in the patients of non-ST elevation ACS does not only indicates a greater risk of non-STEMI but also indicates increased risk of ischemic complications. Several researchers have concluded in various observational studies that in ACS, MPV is highest in subjects with MI than those having stable angina. Therefore, MPV can be useful to estimate extent and severity of coronary vessel diseases.

Amongst circulating platelets, the youngest form is reticulated platelets. They are bigger than senescent platelets and they have the residual RNA that gives reticulated appearance and are hyperactive because they express more GP 1b and GP 2b/3a receptors. Now-a-days, a fast fully automated method is available for the quantification of reticulated platelets via a parameter called IPF, which is ratio of reticulated platelets and total number of platelets. MPV indicates the measure of platelet reactivity and if increased shows worst prognosis.

IPF may be a more sensitive and specific indicator as compared to MPV for measurement of platelet reactivity. It is noticed that in subjects with coronary artery disease (CAD), IPF is increased as compared to normal healthy subjects. The formation of atherosclerotic plaque results in complications like MI and stroke due to the occlusion of thrombotic vessels.[8] Vascular damage repair and the maintenance of narrow capillaries to remain patent is a complex mechanism and platelets act as a key for regulation of the process. Platelets contribute to both the dysfunction of endothelium and rupture of plaque in the process of atherosclerosis.[9]

The platelet interaction with endothelium lining vessels causes excessive activation of platelets which reduces the half-life and increases the turnover of platelets, hence influence the MPV and IPF.[10]

Activation of platelets causes the release of specific proteins. B thromboglobulin is the first platelet- specific protein which is released during the aggregation of platelets. Inflammatory and thrombotic processes both play part in the pathogenesis of development of ACS.[11]

In respect to the above-prescribed issues, platelet activation parameters can be beneficial tools of disease progression before the occurrence of cardiac cell necrosis. Hence the goal of this study was the evaluation of chosen platelet morphological indices MPV, IPF and BTL in patients of ACS compared to controls.[12]

The insight of above-discussed literature, a cross-sectional comparative study was planned which will help understand not only the detailed pathophysiology of ACS but also the risk stratification and to set out prophylactic strategies in high-risk patients to prevent occurrence of ACS.

Methods

It was a cross-sectional comparative study carried out at The Department of Pathology, Postgraduate Medical Institute, Lahore between November 2017 to November 2018. The subjects were selected from Punjab Institute of Cardiology Lahore. Using purposive convenience sampling technique, 85 subjects were selected who

were diagnosed cases of the ACS (Case group) and 85 were normal healthy individuals (Control group), mean age of controls were decided and matched according to the mean age of cases.

Inclusion criteria was based on diagnosis criteria of ACS that is:

Detection of rise of cardiac troponin I levels > 0.04ng/ml and presence of at least one of the following:

- Clinical symptoms of ischemia
- Significant ST-segment T wave changes
- Development of pathological Q waves

Patients with active inflammation, cancer, chronic circulatory insufficiency, severe renal failure, diabetes, past history of ACS or taking antiplatelet or anticoagulant treatment were excluded.

A custom designed performa was used to obtain informed consent and record personal information. Questionnaire was filled for each patient, containing information about collected samples and their results. A 3mL venous blood sample was collected in two separate vacutainers from each patient under aseptic measures. The purple capped vacutainer containing EDTA was used for MPV and IPF and the yellow capped vacutainer containing acid citrate dextrose was used for BTL.

Mean Platelet Volume and Immature Platelet Fraction were performed on blood in EDTA vacutainer, within 3 to 4 hrs of sample collection on Sysmex automated hematology analyzer (XN – 1000). Plasma BTL was detected by using commercially available Elisa's kits according to the manufacturer's instructions. The key variables assessed in our study were:

- Immature Platelet Fraction
- Mean Platelet Volume
- BetaThromboglobulin

Data was entered and analyzed using SPSS version 24. Mean ± standard (S.D) andmedian± inter quartile range (IQR) was used for quantitative data like Age (years), Pulse beat per minute (BPM), systolic and diastolic blood pressure (mmHg), Jugular venous pressure (cm), Cholesterol level (mg/dL), Blood glucose levels (mg/dL), Serum creatinine (mg/dL), Cardiac troponin I (ng/ml), IPF (%), MPVfL (Femtolitre) and Plasma BTL (ng/ml). Independent sample t-test was applied to compare mean of normally distributed data [BP Systolic and diastolic (mmHg), Jugular venous pressure (cm), Cholesterol level (mg/dL), Serum creatinine (mg/dL) and MPVfL (Femtolitre)] in both groups. Mann Whitney U test (denoted by Z in analysis) was applied to compare median of non-normal data such as [Age (years), Pulse beat per minute (BPM), Blood glucose levels (mg/dL), Cardiac tropnin I (ng/ml), IPF (%), Plasma Beta and Thromboglobulin Level (ng/ml)]. P-value≤0.05 was considered as significant.

Results

Demographic and Clinical parameters of studied population:

Distribution of Respondents According to studied parameters:

The mean IPF in cases and control was 8.716 ± 6.2834 (%) and 3.83±1.63% respectively with statistically high levels in cases, p-value < 0.001.

Z-test = 6.58

p-value≤ 0.001 (Significant)

The MPV(fL) in cases was11.65 ± 1.53 and in controls

Table 1: *Demographic and Clinical parameters of studied population:*

	Normal Parameters		Kolmogorov-Smirnov (Z)	p-value	Distribution
	Mean	S.D			
Age (Years)	55.59	10.38	1.67	0.01	Non-Normal
Pulse beat per minute (BPM)	88.47	14.55	1.66	0.01	Non-Normal
BP Systolic (mm Hg)	132.29	13.42	1.10	0.18	Normal
BP Diastolic (mm Hg)	99.93	19.86	1.35	0.052	Normal
Jugular Venous Pressure (cm)	3.51	0.50	4.48	0.00	Normal
Cholesterol level (mg/dl)	234.45	21.48	1.24	0.09	Normal
Blood Glucose levels (mg/dl)	132.52	32.75	2.00	0.00	Normal
Serum Creatinine (mg/dl)	1.10	0.35	1.26	0.08	Normal
Cardiac Troponin (ng/ml)	0.15	0.16	3.48	0.00	Non-Normal
IMMATURE PLATELET FRACTION (%)	6.27	5.19	2.27	0.00	Non-Normal
Mean Platelet Volume (fL)	11.19	1.38	0.99	0.28	Normal
Plasma Beta Thromboglobulin Level (ng/ml)	21.32	14.99	2.97	0.00	Non-Normal

Table 2: *Descriptive statistics of Immature Platelet Fraction (%) beta thromboglobulin and mean platelet volume:*

		Mean	SD	Median	IQR	Minimum	Maximum
Immature Platelet Fraction (%)	**Case**	8.71	6.283	7.50	1.4	31.6	6.8
	Control	3.83	1.63	3.40	1.2	6.8	2.8
	Total	6.27	5.19	5.15	1.2	31.6	4.5
Mean Platelet Volume (fL)	**Case**	11.65	1.53	11.80	8.7	17.0	1.7
	Control	10.74	1.04	10.70	7.0	12.8	1.5
	Total	11.19	1.38	11.20	7.0	17.0	1.5
Beta Thromboglobulin Level (ng/ml)	**Case**	28.35	17.38	28.0	4.0	83.5	22
	Control	14.28	5.80	13.90	3.9	25.0	6.9
	Total	21.318	14.98	14.70	3.9	83.5	15.7

was 10.74±1.04, with statistically higher mean platelet volume in cases as compared to controls, p- value <0.001.

t-test = 4.553

p-value≤0.001 (Significant)

The mean BTL (ng/ml) in cases was also statistically higher as compared to controls i.e. 28.35 ± 17.83 versus 14.28 ± 5.80, p-value < 0.001.

Z-test = 5.73

p-value≤ 0.001(Significant)

Discussion

Age is considered the most important factor that plays a significant role in progression of numerous diseases because most of the diseases are prevalent among elderly people. Present study indicated that majority of the patients in both groups were over 50 years old. The findings of a similar study conducted by Pervin and teammates (2013) were comparable with our study who reported that mainstream of the patients in both groups was more than 40 years old while some of them were upto 40 years old. Our Study indicated that mean age of the cases was 57.04+11.62 years and the mean age of controls was 54.14+9.84 years. The results of a recent study performed by Khalifa and coworkers (2017) highlighted that mean age of the cases was 61.32+7.20 years while the mean age of the controls was 57.40+7.89 years.[13] Another study carried out by Abideen and associates (2017) indicated that mean age of the cases was 50.87±11.02 years while among controls mean age was 47.31±12.09years.[14]

High blood pressure and cholesterol are considerable risk factors associated with ACS. It was found during the study that blood pressure both systolic and diastolic was raised in cases as compared to controls. The mean systolic BP in cases and controls was 137.68 ± 15.621 mmHg and 128.89 ± 18.813 mmHg, while the mean diastolic in cases and control was 86.36 ± 9.716 and 81.39 ± 11.536 mmHg respectively. The findings of a study undertaken by Abdallah and collaborators (2010) showed results similar to our results indicating that mean systolic blood pressure among cases was 132+30 mmHg and among controls 136+30 mmHg while mean diastolic blood pressure among cases was 80+17 mmH g and among controls 79+15mmHg.

During study blood glucose, serum creatinine and cardiac troponin-I were also assessed among cases and controls. Study showed that most of the patients in both groups had normal levels of blood glucose and serum creatinine while raised values of Cardiac Troponin I were seen among majority of the cases but these values were found decreased among most of the controls.

As ACS remains a serious public health problem, so there is need to identify the risk factor to control the disease among population. It has been observed that among patients with ACS the mean platelet volume, IPF and BTLs are raised as compared to normal healthy individuals. During this study when the levels of MPV, IPF and Plasma β-TG were evaluated, study demonstrated that among majority of controls, the levels of mean platelet volume, IPF and BTL were found normal, while in major proportion of cases raised level of MPV, IPF and BTL were observed. Study pointed out that mean IPF among cases was 8.72+6.28 and among controls 3.83+1.63 with statistically significant results showing raised levels among cases. The findings of a study performed by Berny-Lang and fellows (2014) indicated that mean IPF among cases was 5.0 +2.8 and among controls were 4.6+2.7 showing statistically insignificant results.[2] Likewise in our study MPV among cases was 11.65+1.53 and among controls 10.74+1.04 showing statistically significant results.

The results of our study are almost comparable with the study conducted by El- Dosouky and Shehata (2016) who reported that MPV among cases was 13.3+24 and among controls 10.0+0.8 with statistically significant results.[15] Virtually similar results were also obtained from a study undertaken by Abideen and associates (2017) who confirmed that MPV among cases was 10.99+1.34 and among controls 9.21+0.98 with statistically significant results.[13] As far as Plasma β-TG is concerned, study showed a great increase among cases that mean plasma β-TG level among cases was 28.35 + 17.84 ng/mL while among controls it was 14.29 + 5.80 ng/mL showing statistically significant results. The results of another study carried out by Joanna Kaminska (2018) reported that the BTL were significantly higher in patients of ACS as compared to controls.

Conclusion

Current study estimated the levels of MPV, IPF and BTL among patients of ACS and normal healthy individuals. Study concluded that levels of MPV, IPF and BTL were normal among controls while raised level of MPV, IPF and BTL were observed among cases. However, all three parameters had statistically significant difference between the study groups being higher in cases. These results would be useful in early diagnosis of ACS. Increased levels of MPV, IPF and BTL can be used as indicators predisposing to any thrombotic event eventually leading to ACS.

Acknowledgments

Authors would like to acknowledge efforts of all the co-workers and colleagues for their assistance in completion of this manuscript. They contributed specially in terms of communication with study participants; data collection and compilation; and typing, editing and formatting of final manuscript.

Conflict of Interest: None

References

1. Morrad B, Eraslan S, Gorenek B. Prevalence and Types of Supraventricular and Ventricular Arrhythmias Developing in Patients with Acute Coronary Syndrome Cardiology & Cardiovascular Medicine Journal. 2017; 2(1).
2. Go AS, Mozaffarian D, Roger VL, et al. Executive summary: heart disease and stroke statistics—2014 update: a report from the American Heart Association. Circulation. 2014;129(3):399-410.
3. Ahmad S, Asghar N, Rauf A. Vein graft patency in post-cabg symptomatic patients: an angiographic study. Journal of University Medical & Dental College. 2015;6(3):38-45.
4. Wang XH, Liu SQ, Wang YL,et al. Correlation of serum high-sensitivity C-reactive protein and interleukin-6 in patients with acute coronary syndrome. Genetics and Molecular Biology. 2014 ;13(2):4260-4266.
5. Arbab-Zadeh A, Nakano M, Virmani R,et al. Acute coronary events. Circulation. 2012;125(9):1147-1156.
6. Patil SK, Karchi SD. A comparative study of platelet indices in acute coronary syndrome. International Journal of Contemporary Medical Research 2017; 4(3): 77-83.
7. Schmoeller D, Picarelli MM, Paz Munhoz T,et al. Mean platelet volume and immature platelet fraction in autoimmune disorders. Frontiers in medicine. 2017;4:146.
8. Hristov M, Weber C. Myocardial infarction and inflammation: lost in the biomarker labyrinth. Circulation Research. 2015;116:781–783.
9. Nording HM, Seizer P, Langer HF. Platelets in inflammation and atherogenesis. Frontiers in immunology. 2015;6:98.
10. Pal R, Bagarhatta R, Gulati S,et al. Mean platelet volume in patients with acute coronary syndromes: a supportive diagnostic predictor. Journal of clinical and diagnostic research: JCDR. 2014;8(8):MC01.
11. Tanindi A, Sahinarslan A, Elbeg S, et al.Relationship between MMP-1, MMP-9, TIMP-1, IL-6 and risk factors, clinical presentation, extent and severity of atherosclerotic coronary artery disease. The open cardiovascular medicine journal. 2011;5:110-116.
12. Kamińska J, Koper OM, Siedlecka-Czykier E, et al. The utility of inflammation and platelet biomarkers in patients with acute coronary syndromes. Saudi Journal of Biological Sciences. 2018;25(7):1263-1271.
13. Khalifa KA, Helwa MA, Mousa AM. Reticulated platelets in acute coronary syndrome patients. Menoufia Medical Journal. 2017;30(3):880-886.
14. Salman F, Usman R, Shakireen N,et al. Platelet indices in newly diagnosed patients of myocardial infarction. Khyber Medical University Journal. 2017;9(2).
15. El-Dosouky II, Shehata IE. Value of the mean platelet volume in evaluation of patients with acute coronary syndrome. Journal of Medical Diagnostic Methods. 2016;5(1):1-5.

Authors Contribution

S.I: Manuscript writing

M.M.B: Manuscript writing & study design

H.A: Data collection

F.W, K.S: Data interpretation

T.R: Study design, data collection

Induction of Labour with Isosorbide Mononitrate Versus Prostaglandin E2 (PGE2) in Primigravidas (PGs) at Term

Rubina Waheed,[1] Nadia Ashraf,[2] Nadia Sabeen,[3] M Ikram U Allah,[4] Qaiser Javed,[5] Ayesha khalid,[6]

Abstract

Objective: To compare the frequency of caesarean section due to fetal distress with Isosorbide mononitrate versus PGE2 for the induction of labour in primigravida at term.

Methods: It was Randomized Control Trial conducted in Unit I, Department of Obstetrics & Gynaecology, Lahore General Hospital, Lahore from 11th April 2015 to 10th October 2015. 230 primigravida were randomized into two groups i.e. Prostaglandin E2 and Isosorbide mononitrate for induction of labour. The difference in the frequency of caesarean section due to fetal distress with Prostaglandin E2 and Isosorbide mononitrate for induction of labour in the primigravidas at term was calculated as outcome.

Results: The mean age of 27.62 ± 3.909 ranging from 21 to 34 years. The frequency of cesarean section was 12.2%in Prostaglandin E2 group while 0% in Isosorbide mononitrate. There was no effect of gestational age, age of mother and number of doses on outcome.

Conclusion: There is no difference in frequency of cesarean section in primigravida groups induced by either Isosorbide mononitrate versus prostaglandin E2. Wherever applicable and feasible we should opt for Isosorbide mononitrate for induction of labour.

Keywords: Cesarean section, Prostaglandin E2, Isosorbide mononitrate, Dinoprostone, Induction of labour, Primigravida

How to cite: *: Waheed R., Ashraf N., Sabeen N., U Allah I.M., Javed Q., Khalid A. Induction of Labour with Isosorbide Mononitrate Versus Prostaglandin E2 (PGE2) in Primigravidas (PGs) at term. Esculapio 2021;17(02):166-169.*

DOI: ***https://doi.org/10.51273/esc21.2517211***

Introduction

Induction of labor is widely carried out all over the world for several fetal and maternal indications.[1] In the United States induction of labour continues to rise, with 22.5% of all the births in 2006 reported after induction which is twofold increase since 1990.[2] Induction of labour in unfavorable cervix often results in prolonged labor or failed induction with increased risk of operative delivery and morbidity.[1] About 20% of pregnant women undergo induction of labour in the UK. In primigravidas, approximately induction to delivery time is 27 hours and 18 hours required in the cervical ripening phase before labour itself starts. An ideal drug for ripening of cervix would induce adequate cervical ripening without causing uterine contractions.[3] Induction of labour in the presence of unfavorable cervix is a common indication for the use of prostaglandins. However the use of nitrous oxide donors for cervical ripening and induction of labour increased in last years.[4] Agarwal et al., reported that the frequency of caesarean section was 40.7% with PGE2 while 0% with Isosorbide Mononitrate due to fetal distress. The difference between both groups was significant (p< 0.001) Isosorbide Mononitrate is better in terms of low caesarean sections.[5] But Mukhtar et al., reported that the frequency of caesarean section due to fetal distress was 6.7% with PGE2 which was high as compared to Isosorbide mononitrate i.e. 0%. Although the difference between both groups was insignificant (p> 0.05).[6]

1. Rubina Waheed
2. Nadia Ashraf
3. Nadia Sabeen
4. M Ikram U Allah
5. Qaiser Javed
6. Ayesha Khalid

1,3: Lahore General Hospital, Lahore
2: Jinnah hospital Lahore
4: Punjab Institute of Mental,Lahore
5: Central park hospital Lahore
6: Shalimar Hospital, Lahore

Correspondence:
Dr. Rubina Waheed, Department of Gynae and Obst. Lahore General Hospital, Lahore. Email:mailto:rubinawaheed13@yahoo.com" rubinawaheed13@yahoo.com

Submission Date: 31-03-2021
1st Revision Date: 13-04-2021
Acceptance Date: 17-05-2021

The rationale of our study is to compare the frequency of caesarean section due to fetal distress with Isosorbide mononitrate versus PGE2 for induction of labor in primigravida at term. In literature mentioned above, ambiguity was observed in results. It has been observed that Isosorbide Mononitrate cause low frequency of caesarean section as compared to PGE2 and Isosorbide Mononitrate is cheap and safer drug but PGE2 is still in practice due to controversy in reported results as quoted above. Through this study we want to confirm that whether Isosorbide Mononitrate is safer than PGE2, so that in future we can implement the use of Isosorbide Mononitrate for induction of labour, thus the proven efficacy of this drug through this study can make it choice of both medical professionals and for patients as well.

Operational definition

C-Section due to Fetal distressis defined as cesarean section performed because of presumed fetal compromise in the form of abnormal/pathological cardiotocography or the presence of any grade of meconium in the amniotic fluid during first stage of labour.

Methods

It was randomized contolled trial conducted in the Department of Obstetrics &Gynecology, Lahore General Hospital from 11th April 2015 to 10th October 2015. 230 cases selected by Non-probability consecutive sampling, 115 cases in each group is calculated with 80% power of test, 5% level of significance and taking expected percentage of fetal distress i.e. 0% with Isosorbide Mononitrate while 6.7% with PGE2 for induction of labour in PGs at term. Patients included were primigravida of age 18-35 years, females with singleton, cephalic presentation of fetus on ultrasound, gestational age ≥ 37 weeks according to LMP or early scan with reassuring CTG, ruptured membrane (clear liquor) for ≥ 6 hours. Patients excluded with cervical dilatation more than 3 or Bishop more than 5. Females with medical disorders like impaired renal or hepatic function, cardiac diseases (abnormal ECG and medical record), known hypersensitivity to prostaglandins or Isosorbide mononitrate. History of severe asthma, hypotension (BP<110/70mmHg), palpitation and migraine, Cephalopelvic disproportion (assessed on USG).

After the approval from hospital ethical committee, 230 patients fulfilling the selection criteria were included in this study, an informed consent was taken. Demographic profile (name, age, gestational age (G.A), contact) was obtained. Randomly patients were divided in two groups by using random number table. In group Isosorbide Mononitrate, 40mg of Isosorbide mononitrate was administered in the posterior vaginal fornix and dose was repeated every four hours up to 2 dose. In group PGE2, patients were given 3mg vaginaltablet containing dinoprostone and dose was repeated with interval of 6 hours upto 2 doses. The Bishop score was reviewed regularly at 6, 12 and 24 hours after medication. Uterine contractions and fetal heart rate was monitored intermittently and partogram was maintained. If there were signs of fetal distress, then LSCS was done and caesarean section due to fetal distress was labeled (as per operational definition). All the information was recorded on proforma (attached).

Data Analysis

The data was entered and analyzed through SPSS version 17. The quantitative variables like age and gestational age was presented as mean & standard deviation. The frequency and percentage was calculated for caesarean section due to fetal distress. Chi-square test was used to compare caesarean section due to fetal distress in both groups. P-value<0.05 was considered as significant. Data was stratified for age and number of doses of either drug. Chi-Square test was used post stratification.

Results

230 patients were included with mean age of 27.62 ± 3.909 ranging from 21 to 34 years. **(Table-I)** 156 patients (67.8%) in our study population were less than 30 years of age whereas 74 patients (32.2%) were either 30 years or more, Gestational age in 139 patients (60.4%) were between 37 to 38 weeks while in rest of 91 patients (39.6%) it was above 38 weeks. Among whole cohort, 14 patients (6.1%) of sampled population underwent cesarean section. **(Table-II)** 90 patients (39.1%) were administered single dose of drug while in 140 patients (60.9%) it was double.

When we cross tabulated both treatment group with outcome (frequency of cesarean section), results came up significant on applying chi square test. Out of 115 patients of PGE2 group, 14 underwent C-section while in Isosorbide not a single patient had C-section. **(Table-III)**

When we stratified our data of dose of drug in treatment group (PGE2 & Isosorbide) and cross tabulated

Table 1: *Age Distribution of Sampled Population in Years*

	N	Minimum	Maximum	Mean	Std. Deviation
Age	230	21	34	27.62	3.909

Table 2: *Frequency Distribution of Sample Population by Cesarean Section*

		Frequency	Percent
Valid	Yes	14	6.1
	No	216	93.9
	Total	230	100.0

Table 3: *Cross tabulation between Group & Cesarean Section*

		Cesarean Section		Total
		Yes	No	
Group	PGE2	14	101	115
		12.2%	87.8%	100.0%
	Isosorbide	0	115	115
		0.0%	100.0%	100.0%
Total		14	216	230
		6.1%	93.9%	100.0%
Using Pearson Chi-Square, p value =0.001 (Significant)				

with cesarean section, we found, patients with single dose had 3 patients with cesarean section in PGE2 group while in Double dose, PGE2 group had 11 patients with cesarean section. **(Table-III)**

Discussion

Labor induction in unfavorable cervix often results in failed induction or prolonged labor with increased risk of operative delivery and morbidity especially in primigravidas.[1] Delivery before the onset of labour is indicated when the maternal and fetal risks associated with continuing the pregnancy are thought to be higher than induction of labour. Prostaglandin E2 and Isosorbide mononitrate play an important role in cervical ripening (a mechanism of remodelling in which collagen is degraded leading to softening of the cervix) and labour induction.[7]

In our study, among whole cohort, 14 patients (6.1%) of sampled population underwent cesarean section. frequency of cesarean section was 12.2% in Prostaglandin E2 group (all 14 patients in this group) while frequency of cesarean section in Isosorbide mononitrate was 0%. The difference was more significant when we applied chi square test (p value < 0.01). It implies that although efficacy of Prostaglandin E2 is known regarding induction of labour but frequency of cesarean section remains high secondary to fetal distress.

Our results are comparable with previous studies. In a previous study, Mukhtar et al., reported that the frequency of caesarean section due to fetal distress was 6.7% with PGE2 which was high as compared to Isosorbide mononitrate i.e. 0%. Although the difference between both groups was insignificant (p>0.05).[6]

While in another trial, Agarwal et al., assessed that PGE2 group had higher incidence of caesarean sections (27% versus 17%) and uterine tachysystole (15%) and N-RFH (11%) compared to 0% in IMN group.[5]

In our study PGE2 had 12.2% caesearean rate as compared to nil in isorbide group. In PGE2 6.3% had single dose and 16.4% who had caesearean had double dose.

After randomization, we cross tabulated the data for all competing and potential confounding variables like age but there was no significant difference. It depicted that both group had equal distribution with respect to their age.

When we stratified our data of age groups in treatment group (PGE2 & Isosorbide) and cross tabulated with cesarean section, we found, patients with age below 30 years had 9 patients with cesarean section in Prostaglandin E2 group whereas in above 30 years, Prostaglandin E2 group had 5 patients with cesarean section. It shows that efficacy of Isosorbide mononitrate does not reduce with advancing age.

When we stratified our data of dose of drug in treatment group (PGE2 & Isosorbide) and cross tabulated with frequency of cesarean section, we found, 3 patients with cesarean section had single dose of Prostaglandin E2 while 11 patient had double dose of Prostaglandin E2.When we stratified our data of gestational age in treatment group (PGE2 & Isosorbide) and cross tabulated with cesarean section, we found, patients with gestational age from 37 to 38 weeks and above 38 weeks had same number of patients (7) with cesarean section in PGE2 group.

In my study vaginal delivery occurred in 87.8% of subjects and in 100.0% of patients in isosorbide nitrate group and it was 93.8% in single dose group as compared to double dose group in 83.6% of subjects.

In another study by Dhuan et al showed that 38 patients in group I(nitrate) and 31 in group II(PGE2) had normal vaginal delivery, 7 women of group I (Nitrate) and 12 of group II (PGE2) underwent cesarean section while four women (8%) of each group had instrumental delivery and concluded that use of prostaglandins for ripening of cervix and induction of labour causes cervical resistance by reorganizing the collagen fibrils in

the cervix. It decreases the concentration of sulfated glycosaminoglycan (GAG) which causes reduction in electrostatic interactions and weakening of the interfibrillary network of the cervix. In addition to this, prostaglandins also initiate the myometrium contraction and increase the frequency of caesearean section.[8]

Compared with other prostaglandins, one small trial showed that need of oxytocin was reduced with oral misoprostol. Two trials were done on comparison with oral and vaginal misoprostol using different doses but no significant differences were evident.[9]

In our study we stratified caesearan rate for age groups in treatment group (PGE2 & Isosorbide) 5.8% patients with cesarean section in PGE2 group whereas in above 30 years, PGE2 group had 17.2% patient with cesarean section. Also gestational age in treatment group (PGE2 & Isosorbide) and cross tabulated with cesarean section, we found, patients with gestational age from 37 to 38 weeks and above 38 weeks had same number of patients (7) with cesarean section in PGE2 group.

The rate of caesarean section was found to be higher in the PGE2 group than IMN (27% versus 17%). In the study by Sharma et all in 2000 reported higher caesarean section rate in PGE2 group compared to IMN and GTN group (60% versus 40%) conforming my study results.[10,11]

Conclusion

It is concluded that at current sample size we reject the null hypothesis that there is no difference in frequency of cesarean section in primigravida groups induced by either Isosorbide mononitrate versus prostaglandin E2 and accept the alternate hypothesis that Isosorbide mononitrate is a better option for induction of labour as far as frequency of cesarean section due to fetal distress is concerned. In our study, frequency of cesarean section came out 12.2% in Prostaglandin E2 group while 0% in Isosorbide mononitrate group. Wherever applicable and feasible we should opt for Isosorbide mononitrate for induction of labour. Further studies should be encouraged in this regard.

Conflict of Interest: None

References

1. Morad AWA. Vaginal Isosorbide mononitrate versus transcervical Foley's catheter for cervical ripening and induction of labor. Ain Shams Med J. 2011; 62(10): 993-1002.
2. Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Menacker F, Kirmeyer S, et al. National Vital Statistics Reports. Births: final data for 2006. 2009:57(7) [cited 2014];Available from: www.cdc.gov/nchs/data/ nvsr/ nvsr57/nvsr57_07.pdf.
3. Bollapragada SS, MacKenzie F, Norrie JD, Eddama O, Petrou S, Reid M, et al. Randomised placebo-controlled trial of outpatient (at home) cervical ripening with Isosorbide mononitrate (IMN) prior to induction of labour – clinical trial with analyses of efficacy and acceptability. The IMOP Study. BJOG: Int J Obstet Gynaecol. 2009;116(9):1185-95.
4. Abdellah MS, Hussien M, AboAlhassan A. Intravaginal administration of Isosorbide mononitrate and misoprostol for cervical ripening and induction of labour: a randomized controlled trial. Arch Gynecol Obstet. 2011;284(1):25-30.
5. Agarwal K, Batra A, Batra A, Aggarwal A. Randomized Comparison of Isosorbide Mononitrate and PGE2 Gel for Cervical Ripening at Term including High Risk Pregnancy. Int J Reprod Med. 2014;147274:0-5.
6. Mukhtar A, Kazmi F, Rehana F. Comparison of Vaginal Isosorbide Mononitrate with Prostaglandin E2 for Pre-Induction Cervical Ripening at Term. J Rawal Med Coll. 2013;17(1):110-2.
7. Karim SM, Hillier K. Prostaglandins in the control of animal and human reproduction. Br Med Bull 1979; 35:173-7.
8. Duhan N, Hooda M, Sen J. Intracervical dinoprostone versus vaginal isosorbide dinitrate for cervical ripening. 2012; 2 (2): 269-275
9. Hofmeyr GJ, Gülmezoglu AM, Alfirevic Z. Misoprostol for induction of labour: a systematic review. Br J Obstet Gynaecol. 1999 ;106(8):798-803.
10. Chanrachakul B, Herabutya Y, Punyavachira P. Randomized trial of isosorbide mononitrate versus misoprostol for cervical ripening at term. International Journal of Gynecology and Obstetrics. 2002;78(2):139–145. [PubMed]
11. Sharma Y, Kumar S, Mittal S, Misra R, Dadhwal V. Evaluation of glyceryl trinitrate, misoprostol, and prostaglandin E 2 gel for preinduction cervical ripening in term pregnancy. Journal of Obstetrics and Gynaecology Research. 2005;31(3):210–215

Authors Contribution

R.W: Conceptualization of Project, Writing of Manuscript
N.A: Data Collection
N.S: Literature Search
M.I.U.A: Statistical Analysis
Q.J: Drafting, Revision
A.K: Data Collection

Original Article

Effect of Acute Aerobic Exercise on Diastolic blood Pressure in Preclinical Medical Students of Services Institute of Medical Sciences, Lahore

Muhammad Shafiq,[1] Miraa Qutab,[2] Saqib Javaid,[3] Rida Fatima,[4] Maham Ijaz,[5] Abdullah Shafiq,[6] Najla Shore[7]

Abstract

Objective: To evaluate the response of acute bout of moderate exercise on DBP in preclinical medical students of Services Institute of Medical Sciences (SIMS), Lahore and to compare it with gender, family history, lifestyle and waist-hip-ratio of the study participants.

Methods: This cross-sectional study was performed in the Department of Physiology, SIMS from May to December 2019. Ninety-three (93) healthy male and female MBBS students were recruited through nonprobability convenient sampling. Socio-demographic components were gathered using a ques-tionnaire. Anthropometric data (height, weight and waist-hip-ratio) and resting DBP was recorded before the exercise. All participants underwent exercise challenge on a treadmill. Post-exercise DBP was measured by taking serial recordings at zero minutes, 2 minutes and 5 minutes after exercise cessation. Data was analyzed using SPSSv20.

Results: Within the 93 participants, 87(93.5%) were physically inactive, with only 6(6.5%) were physically active. In comparison with the baseline DBP, the DBP at zero and 2 minutes post exercise was statistically significant ($p<0.001$) in study participants. There was no significant correlation between DBP immediately after exercise and gender ($p = 0.751$); family history of hypertension and diabetes mellitus ($p = 0.603$); and lifestyle ($p = 0.954$). A non-significant ($p = 0.636$) yet positive correlation was observed between post exercise DBP and waist-hip-ratio among males.

Conclusion: Our study revealed that an acute bout of exercise significantly raised the DBP immediately after exercise. This rise in BP was not significantly related to gender, lifestyle and family history of diabetes mellitus and hypertension.

Keywords: Diastolic blood pressure, aerobic exercise, waist-hip-ratio, medical students, treadmill

How to cite: *Shafiq M., Qutab M., Javaid S., Fatima R., Ijaz M., Shafiq A. Effect of acute aerobic exercise on diastolic blood pressure in preclinical medical students of Services Institute of Medical Sciences, Lahore. Esculapio 2021;17(02):170-174.*

DOI: ***https://doi.org/10.51273/esc21.2517212***

Introduction

For decades, hypertension (HTN) has been known as an international health issue estimated to affect over one billion people worldwide with numbers expected to exceed one and a half billion by the year 2025.[1] According to a recent survey, the prevalence of HTN is 35% in the Pakistani population.[2] In 2020, the International Society of Hypertension have revised the threshold value for blood pressure (BP) to 130/85 mm Hg.[3] Longstanding, uncontrolled HTN in young individuals leads to silent premature multi-organ damage.[4] Data have claimed that the root of the development of HTN in middle-aged adults ranges back to younger age and is linked with risk factors such as lifestyle, family history, and obesity.[5]

Blood pressure measured pre and post-exercise sessions is a crucial part of exercise testing.[6] During upright

1. Muhammad Shafiq
2. Miraa Qutab
3. Saqib Javaid
4. Rida Fatima
5. Maham Ijaz
6. Abdullah Shafiq
7. Najla Shore

1,3-5,7. *Department of Physiology, SIMS, Lahore.*
2. *Department of Pharmacology, Ameer Uddin Medical College, Lahore*
6. *FMH College of Medicine and Dentistry , Lahore*

Correspondence:
Dr. Muhammad Shafiq, *Associate Professor, Department of Physiology, SIMS, Lahore. E-mail: mshafiqsims@gmail.com*

Submission Date:	16-01-2021
1st Revision Date:	27-01-2021
2nd Revision Date:	15-02-2021
Acceptance Date:	08-03-2021

exercise, the normal BP response observed is a progressive increase in systolic blood pressure (SBP) whereas, the diastolic blood pressure (DBP) remains almost unchanged or slightly decreases due to vasodilatation in the working muscles.[7]

On the other hand, post-exercise increase (>10 mm Hg) or a delayed recovery of DBP represents an abnormal response. This abnormal response is considered as initial signs of atherosclerotic vascular disease and is linked with a higher risk of preclinical and clinical cardiovascular disease, and death among middle-aged adults in the long run.[8] Pathophysiology states that this abnormal DBP response can be a result of increased arterial stiffness or underlying endothelial dysfunction consequently, lowering the bioavailability and production of nitrous oxide (NO). Furthermore, increased DBP with exercise indicates a higher peripheral arteriolar resistance and impaired exercise-induced vasodilation.[9]

Numerous cohort studies have associated the abnormal DBP during and after exercise tests with the development of HTN later in life.[10] Importantly, recent data have revealed a 3.6-fold increased risk of developing HTN after 6.5 years of follow-up.[11] A meta-analysis by Schultz et al., included 12 studies totaling over 46,000 participants traced for around 15 years, reported that a 36% increase in cardiovascular events occurred independent of sociodemographic factors in individual having an abnormal DBP response to exercise years ago.[12]

Waist-hip-ratio (WHR) is a measure of body composition. According to studies, it is a better indicator of body fat than body mass index, as it relates to the risk for the development of diseases. The values of WHR >1.0 in men and >0.85 in women have been widely accepted as abnormal and is linked to a significantly higher risk for the development of cardiovascular disease.[13]

Numerous studies have explained the relationship between SBP and exercise in various study populations; however, fewer studies have explored the DBP response following exercise. This study aimed to determine the effect of an acute bout of moderate exercise on baseline DBP among undergraduate medical students and to correlate it with gender, family history of hypertension and diabetes mellitus, lifestyle and waist-hip-ratio. To the best of our knowledge, this is the pioneer study in Pakistan.

Methods

Study approval was attained from Institutional Review Board, SIMS, Lahore. This cross-sectional study was performed in the Department of Physiology, SIMS between May to December 2019. The subject population was healthy young male and female medical students of first and second year MBBS recruited through nonprobability convenient sampling.

Any participant with a history of smoking, known cardiovascular, metabolic, neurological, pulmonary, orthopedic disorders, or taking drugs (beta-blockers and anxiolytics) was excluded. The participants were instructed not to indulge in strenuous physical activity 24 hours before the test and not to consume heavy meals, tea or coffee at least 2 hours before the exercise.

All participants qualified through Physical Activity Readiness Questionnaire (PAR-Q+) 14 and signed the informed consent. The demographic information related to age, gender, family history of diabetes mellitus (DM) and HTN, and an average amount of time spent in planned exercise was recorded. Lifestyle was categorized into physically active and physically inactive as per WHO guidelines.[15]

The sample size was calculated to be 124 using the formula $1.96^2 \times \sigma^2 / E^2$\ with 95% confidence interval and 5% margin of error of the study.[16] With the best of our efforts we were able to recruit 93 participants having a response rate of 75%.

Anthropometrics and Body Composition Measures

Weight (kg) was measured by using an electronic weighing scale (Certeza, China). Height (cm) was measured using a wall-mounted tape with the participants standing bare feet against the wall. Another measuring tape was used to measure the waist and hip circumference. Measurement of waist was done at the level of the umbilicus. Hip circumference was measured around the widest portion of the buttocks. The WHR was calculated by dividing the waist measurement by the hip measurement.

Exercise test

Blood pressure was measured by mercurial sphygmomanometer (Bokang, China) after 5 minutes of rest before the exercise test. Both systolic and diastolic BP were measured as per the standard protocol.[17]

The participant was then asked to mount the treadmill (Revo-Fitness, China). Each participant started with a warming up session of 3 minutes at 3 miles per hour

(mph) at 0-degree incline. After 3 minutes, the participant underwent an exercise challenge in which the speed of treadmill was increased to 4 mph with 0-degree incline for the next 8 minutes. After completion of the exercise test, DBP was recorded by using the same mercury sphygmomanometer immediately post-exercise i.e. at 0 minutes (DBP-0), 2 minutes (DBP-2) and 5 minutes (DBP-5) after the exercise session.

SPSS version 20 was used to analyze data. Mean (m) and standard deviation (SD) was calculated for continuous variables. Pre and post-exercise DBP were compared using the paired sample t-test. The chi-square test was used to determine the correlation between post-exercise DBP and gender, lifestyle and family history. A p-value <0.05 was taken as statistically significant.

Results

Out of the 93 students that participated in the study, 59 (63.4%) were male and 34 (36.6%) were female. Most of the participants 87 (93.5%) were physically inactive, while 6 (6.5%) were physically active. The anthropometric data of the participants are given in **table 1**.

The resting DBP was compared with DBP-0, DBP-2 and DBP-5. The increase in diastolic blood pressure at zero minute and 2 minutes post exercise versus the resting value (ΔDBP) was significantly higher ($p < 0.001$). Whereas, the comparison of baseline DBP to DBP-5 was statistically not significant ($p = 0.120$) which meant that the DBP of the participants returned to normal at 5 minutes post exercise as shown in **table-2**.

A chi-square test of independence showed that there was no significant correlation between DBP-0 and gender, family history of DM & HTN, and lifestyle $X^2(2, N=93) = 0.100$, $p = 0.751$, $X^2(3, N=93) = 0.100$, $p=0.603$, $X^2(2, N=93)=0.003$, $p=0.954$, respectively. These results depict that DBP with exercise has no significant association with these variables as shown in **table 3**.

Scatter plot A shows a non-significant positive ($r = 0.063$, $p = 0.636$) correlation between DBP - 0 and waist-hip-ratio in male participants indicating that with an increase in waist-hip ratio, post-exercise DBP tends to rise. Plot B shows a non-significant ($r = -0.223$, $p = 0.205$) negative correlation between the DBP-0 and female waist-hip-ratio. Surprisingly, in females, an increase in waist-hip-ratio leads to a decrease in post-exercise DBP – 0.

Table 2: *Comparison of Baseline DBP with DBP-0, DBP-2 and DBP-5 using the Paired t Test*

Variable 1 (n=93)	Variable 2 (n=93)	Value Mean±S.D	p-value
Baseline DBP (mm Hg)	DBP – 0	8.9±7.4	0.000*
	DBP – 2	5.1±6.3	0.000*
	DBP - 5	0.8±4.9	0.120

p value < 0.001 – highly significant

Table 3: *Comparison of Post-Exercise DBP-0 with Gender, Family History and Lifestyle of the Participants using the Pearson Chi-Square Test*

Variable 1	Variable 2	Pearson chi square value	p-value
Post exercise DBP – 0	Family history of DM and HTN	0.603	0.896
	Gender	0.100	0.751
	Lifestyle	0.003	0.954

p > 0.05 : non-significant

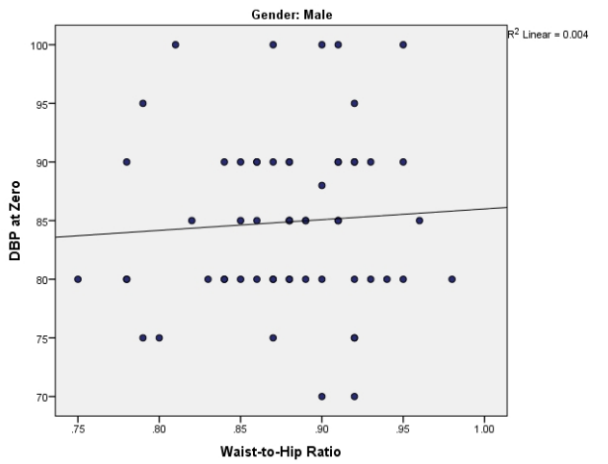
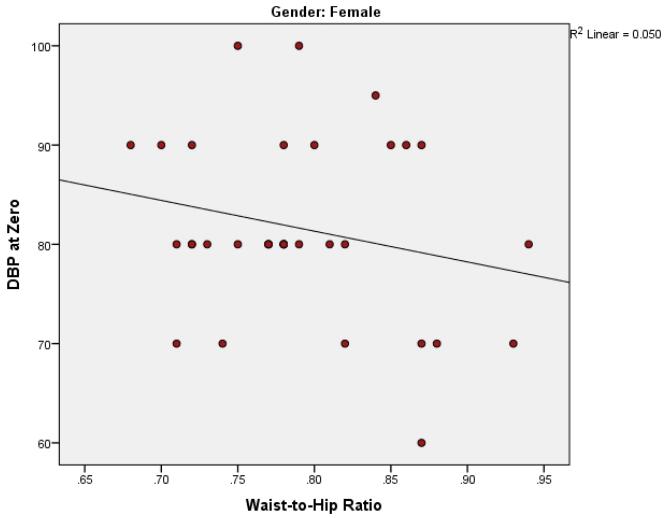


Table 1: *Baseline Characteristics of Participants*

Age (years)	Weight (kg) n=93	Height (cm) n=93	Waist-hip-ratio n=93		DBP (mm Hg)			
			Male n=59	Female n=34	Baseline (before exercise) n=93	DBP-0 n=93	DBP-2 n=93	DBP-5 n=93
20±1	68.5±13.9	171±10	0.88±0.05	0.71±0.06	74±7	82±8	78.6±8	74±8

Figure 1 (A and B): *Scatter Plots showing the Correlation between Waist-Hip-Ratio and Post-exercise DBP – 0 with Regards to Gender of the Participants*



Discussion

This study was done to evaluate the effect of an acute bout of moderate exercise on DBP in undergraduate medical students and to assess its correlation with variables like gender, lifestyle, family history of DM and HTN and waist-hip-ratio.

Health benefits of physical activity include improved cardiorespiratory fitness. In this study, the majority of the participants 87(93.5%) were physically inactive, and 6(6.5%) were physically active. This aligns with studies of Jose. et al[18] and Abdel-Salam, et al[19] reported a far greater proportion (60-70%) of study participants as physically inactive. A much larger percentage of physically inactive participants in our study may be due to the competitive nature of medical education and growing inclination towards social media and online games.

Exercise is known to cause changes in the cardiovascular parameters. As a normal response, the results of numerous studies done previously showed that the DBP after an acute bout of exercise decreases slightly[20], 21 or remains the same.[22,23] However, this was not the case in the present study. A novel finding of the present investigation was that there was a significant ($p<0.001$) rise in DBP – 0 and remained significantly ($p<0.001$) elevated till DBP-2 of the recovery period. The difference in findings can be attributed to the use of a different exercise test protocol and different age groups of the study participants. Studies mentioned above were done on middle-aged adults, asking the subjects to exercise for 30 min. In comparison, the present study was conducted on younger adults with an exercise challenge of 8 minutes. A retrospective study done by Sydó et al over 17 years, reported similar findings to the present study. He reported 3463 participants aged 30-60 years to have an abnormal DBP response (increase of >10 mm Hg) post-exercise session.[24]

Several factors may influence the DBP response to clinical exercise testing. The present study reported no evidence of a statistically significant correlation between DBP – 0 with gender ($p = 0.751$), lifestyle ($p = 0.954$) and family history of DM and HTN ($p = 0.603$) in the participants. Contrary to our results, Daida, et al reported the DBP response to exercise to be higher in sedentary men compared with women.[25] Probable reasons of difference in our result may be due to a younger study sample (19-20 years) thus, the effect of lifestyle, family history and gender is too early to occur.

Increased fat accumulation in the body can lead to an abnormal DBP response to exercise. In the present study, a positive yet non-significant correlation was observed between DBP – 0 and WHR in male, stating that an increase in WHR leads to an increase in DBP response. A similar finding reported in a study that DBP response in obese subjects showed an abnormal (rise) post-exercise DBP response.[24]

Our sample size comprised of a small group of preclinical year medical students from a single medical college. Therefore, these results cannot be generalized to the whole student population in Pakistani medical colleges thus, requiring studies to be conducted using a larger sample size across multiple institutions. We also suggest a future cohort study involving tracking the subjects over years to establish a relationship between raised post-exercise DBP and early onset HTN in later years.

Conclusion

Our study revealed that an acute bout of exercise significantly raised the DBP immediately after exercise. This rise in DBP was not significantly related to gender, lifestyle and family history of DM and HTN. Based on our results, the presence of a significant rise in post moderate exercise DBP could be considered a good indicator for making lifestyle changes.

Conflict of Interest: None

References

1. Williams B, Mancia G, Spiering W, Agabiti Rosei E, Azizi M, Burnier M, et al. 2018 ESC/ESH Guidelines for the management of arterial hypertension: The Task Force for the management of arterial hypertension of the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH). Eur Heart J2018;39(33):3021-3104.

2. Shafi ST, Shafi T. A survey of hypertension prevalence, awareness, treatment, and control in health screening camps of rural central Punjab, Pakistan. Journal of epidemiology and global health2017;7(2):135-140.
3. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertension2020;75(6):1334-1357.
4. Johnson HM, Bartels CM, Thorpe CT, Schumacher JR, Pandhi N, Smith MA. Differential Diagnosis and Treatment Rates Between Systolic and Diastolic Hypertension in Young Adults: A Multidisciplinary Observational Study. Journal of clinical hypertension 2015 Nov; 17(11):885-894.
5. Ranjan DP. Study of body mass index, waist-to-hip ratio, systolic blood pressure-to-height ratio, and diastolic blood pressure-to-height ratio among pre-hypertensive and normotensive students. National Journal of Physiology, Pharmacy and Pharmacology 2017; 7(7): 665.
6. Le V-V, Mitiku T, Sungar G, Myers J, Froelicher V. The blood pressure response to dynamic exercise testing: a systematic review. Prog Cardiovasc Dis2008; 51(2): 135-160.
7. Laukkanen JA, Kurl S. Blood pressure responses during exercise testing—is up best for prognosis? Ann Med 2012;44(3):218-224.
8. Thanassoulis G, Lyass A, Benjamin EJ, Larson MG, Vita JA, Levy D, et al. Relations of exercise blood pressure response to cardiovascular risk factors and vascular function in the Framingham Heart Study. Circulation2012;125(23):2836-2843.
9. Lambiase MJ, Dorn J, Thurston RC, Roemmich JN. Flow-mediated dilation and exercise blood pressure in healthy adolescents. J Sci Med Sport 2014; 17(4): 425-429.
10. Yzaguirre I, Grazioli G, Domenech M, Vinuesa A, Pi R, Gutierrez J, et al. Exaggerated blood pressure response to exercise and late-onset hypertension in young adults. Blood Press Monit2017;22(6):339-344.
11. Caselli S, Serdoz A, Mango F, Lemme E, Vaquer Seguì A, Milan A, et al. High blood pressure response to exercise predicts future development of hypertension in young athletes. Eur Heart J2019;40(1):62-68.
12. Schultz MG, Otahal P, Cleland VJ, Blizzard L, Marwick TH, Sharman JE. Exercise-induced hypertension, cardiovascular events, and mortality in patients undergoing exercise stress testing: a systematic review and meta-analysis. Am J Hypertens2013;26(3):357-366.
13. Park K. Park's textbook of preventive and social medicine. 23rd. Jabalpur, India: M/S Banarsidas Bhanot 2015.
14. Warburton DE, Jamnik V, Bredin SS, Shephard RJ, Gledhill N. The 2019 physical activity readiness questionnaire for everyone (PAR-Q+) and electronic physical activity readiness medical examination (ePARmed-X+). The Health & Fitness Journal of Canada 2018; 11(4):80-83.
15. Piercy KL, Troiano RP, Ballard RM, Carlson SA, Fulton JE, Galuska DA, et al. The physical activity guidelines for Americans. Jama2018;320(19):2020-2028.
16. Bhatti R, Shaikh DM. The effect of exercise on blood parameters. Pakistan Journal of Physiology 2007; 3(2).
17. Pickering TG, Hall JE, Appel LJ, Falkner BE, Graves J, Hill MN, et al. Recommendations for blood pressure measurement in humans and experimental animals: part 1: blood pressure measurement in humans: a statement for professionals from the Subcommittee of Professional and Public Education of the American Heart Association Council on High Blood Pressure Research. Hypertension2005;45(1):142-161.
18. Jose J, Sruthi M. Role of physical activity on mental health and academic performance among medical students: a cross-sectional study. International Journal of Community Medicine and Public Health2019; 6(11): 4789.
19. Abdel-Salam D, Abdel-Khalek E. Pattern and barriers of physical activity among medical students of Al-Jouf University, Saudi Arabia. Journal of High Institute of Public Health2016;46(2):41-48.
20. De Miranda Bermudes AML, Vassallo DV, Vasquez EC, Lima EG. Ambulatory blood pressure monitoring in normotensive individuals undergoing two single exercise sessions. Resistive exercise training and aerobic exercise training. Arquivos brasileiros de cardiologia2003;81:65-71.
21. Forjaz CL, Ortega KC, Santaella DF, Mion Jr D, Negrão CE. Factors affecting post-exercise hypotension in normotensive and hypertensive humans. Blood Press Monit2000;5(5):255-262.
22. Quinn T. Twenty-four hour, ambulatory blood pressure responses following acute exercise: impact of exercise intensity. J Hum Hypertens2000;14(9):547-553.
23. Fisher MM. The effect of aerobic exercise on recovery ambulatory blood pressure in normotensive men and women. Research quarterly for exercise and sport 2001;72(3):267-272.
24. Sydó N, Sydó T, Gonzalez Carta KA, Hussain N, Merkely B, Murphy JG, et al. Significance of an Increase in Diastolic Blood Pressure During a Stress Test in Terms of Comorbidities and Long-Term Total and CV Mortality. Am J Hypertens2018;31(9):976-980.
25. Daida H, Allison TG, Squires RW, Miller TD, Gau GT, editors. Peak exercise blood pressure stratified by age and gender in apparently healthy subjects. Mayo Clinic Proceedings; 1996: Elsevier.

Authors Contribution

M.S, N.S: Conceptualization of Project
M.I: Data Collection
A.S: Literature Search
S.J: Statistical Analysis
M.Q: Drafting, Revision
R.F: Writing of Manuscript

Comparison of Alvarado Score and Paediatric Appendicitis Score for Diagnosing Appendicitis in Children

Naeem Liaqat,[1] Asif Iqbal,[2] Wajeeh Ur Reham,[3] Zulfiqar Ahmed,[4] Fozia Bashir,[5] Sajid Hameed Dar[6]

Abstract

Objective: To compare diagnostic accuracy of Alvarado score (AS) and Paediatric Appendicitis Score (PAS) for diagnosis of acute appendicitis in children.

Methods: This study was conducted at the department of Pediatric Surgery Children Hospital Lahore, over a period of 1 year. All the patients undergoing appendicectomy were included. Alvarado score and Pediatric Appendicitis score (PAS) was evaluated, compared and appendix specimen sent for histopa-thology. All findings were recorded in proforma. The collected data was analyzed by SPSS version 24. The mean Alvarado score and PAS was calculated, and stratified according to the histopathology reports. The sensitivity and specificity of both Alvarado score and PAS for three strata including score 3-5, 5-7 and 8-10 were also calculated.

Results: A total of 177 patients were included in the study. The mean age of the patients was 9.16 ± 2.386 years. Among these 118 patients (67%) were male. The mean duration of pain was 21.42 ± 19.05 hours. Biopsy report showed that 18 patients (10.1%) had normal appendix with no signs of inflammations while 159 patients (89.9%) had inflammation on histopathology. We stratified the histopathology reports according to Alvarado score ≤7 and >7 and P-vale was found significant. Similarly PAS ≤7 and >7 was stratified and P-value was not significant. The difference in mean Alvarado score between having acute appendicitis and those with normal histopathology was significant (P= 0.000) while this difference in mean PAS was not found significant (P= 0.325).

Conclusions: None of the scoring system has adequate diagnostic accuracy and clinical judgment is preferred.

Key Words: Alvarado Score; PAS; Appendicitis; Children

How to cite: : *Liaqat N., Iqbal A., Rehman ur W., Ahmed Z., Bashir F., Dar H.S. Comparison of Alvarado score and Paediatric Appendicitis Score for diagnosing appendicitis in children" Esculapio 2021;17(02):175-178.*

DOI: ***https://doi.org/10.51273/esc21.2517213***

Introduction

Acute appendicitis (AS) is the most common pediatric surgical emergency and appendectomy is the most commonly performed procedure in children.[1] AA is the inflammation if appendix with classical presentation in the form of anorexia, nausea or vomiting, fever, periumbilical pain initially which may later shift to right iliac fossa.[2] On examination, there is tachycardia, tenderness, and rebound tenderness. However, the signs and symptoms may vary and the clinical diagnosis is tricky especially in children who cannot localize pain. There are no other diseases that have such a variety of symptoms as AA. Also, the classical signs and symptoms are mostly absent in 20-33% of the patients and due to this many children present late with complications like perorated appendix, abscess or peritonitis. [3,4]

Delayed or missed diagnosis have the potential to result in significant morbidity from appendiceal perforation, abscess formation, wound infection, wound dehiscence and even mortality. However, negative diagnosis of

1. Naeem Liaqat
2. Asif Iqbal
3. Wajeeh Ur Rehman
4. Ahmed
5. Fozia Bashir
6. Sajid Hameed Dar

1. Medicare Hospital, Rawalpind
2. Children's Hospital Lahore
3. DHQ Hospital Nankana
4. Nishtar Hospital Multan
5. Lahore General Hospital
6. Services Hospital Lahore

Correspondence:
Dr. Naeem Liaqat, Assistant Professor, Medicare Hospital, Rawalpind
Email: isimsonian.chaudary@gmail.com

Submission Date: 29-03-2021
1st Revision Date: 27-04-2021
Acceptance Date: 12-05-2021

acute appendicitis exposes children to unnecessary operation.[5]

Many scoring systems were devised for the diagnosis of acute appendicitis including Alvardo score (AS), RIPASA, Samuel, Pediatric Appendicitis Score (PAS) which can help the physician and the surgeon to finally reach a diagnosis. AA is quite a rare in neonatal period of life and is much common in childhood and early adult life.[6] Generally, these clinical scoring systems are more informative than specific symptoms or signs alone. Still, they are not capable of predicting appendicitis with sufficient probability and therefore should not be used alone to diagnose it.[7] There is still a debate regarding the diagnostic accuracy of these scoring systems for AA.[8] However, most commonly used scores are AS and PAS. No specific data or study is available which compares the diagnostic accuracy of these scores so it is difficult to say which scores is helpful in making the diagnosis. We conducted this study to compare the diagnostic accuracy of AS and PAS.

Methods

We conducted this prospective study at The Department of Pediatric Surgery of The Children's Hospital & the Institute of child health, Lahore. The study took place over a period of 1 year from January 2018 till December 2018. Ethical approval was taken before the start of study. All the pediatric patients undergoing appendicectomy were included in the study. A pre designed proforma was used for data collection which consist of four parts, first part include the demographic details of patients, second part had two scoring systems i.e. (AS and PAS). While the 3rd and 4th part of proforma were about the operative and histopathology findings. In all patients AS and PAS were evaluated and findings were recorded on proforma. The patients included in the study underwent appendectomies appendicular tissue was sent for histopathology. Sampling was done by the method of consecutive sampling.

The collected data was analyzed by SPSS version 24.

The mean of Alvarado score and PAS was calculated, we also stratified the histopathology reports to Alvarado score and PAS. The sensitivity and specificity of both Alvarado score and PAS for three strata including score 3-5, 5-7 and 8-10 were also calculated.

Results

A total of 177 patients were included in the study. The mean age of the patients was found to be 9.16 ± 2.386 years. Among these 118 patients (67%) were male while remaining 59 patients (33%) were females. The mean duration of pain was 21.42±19.05 hours. Seventy six percent of patients (n=135) were having history of pain for less than 24 hours while 42 patients (24%) had history of more than 24 hours. Per-operative findings of all these patients are summarized in **figure 1**. Biopsy report showed that 18 patients (10.1%) had normal appendix with no signs of inflammations while 159 patients (89.9%) had inflammation on histopathology. It also showed that 41 patients who had normal looking appendix ultimately showed signs of inflammation in 23 specimens. We stratified the histopathology reports according to Alvarado score 7 and >7 and P-vale was found significant. Similarly PAS 7 and >7 was stratified and P-value found not significant **(Table1)**.The difference in mean Alvarado score between having acute appendicitis and those with normal histo-pathology was significant (P= 0.000) while this diffe-rence in mean PAS was not found significant (P= 0.325) **(Table 2)**. The sensitivity and specificity of both Alva-rado score and PAS for three strata including score 3-5, 5-7 and 8-10 were calculated and summarized in **Table 3 and 4**.

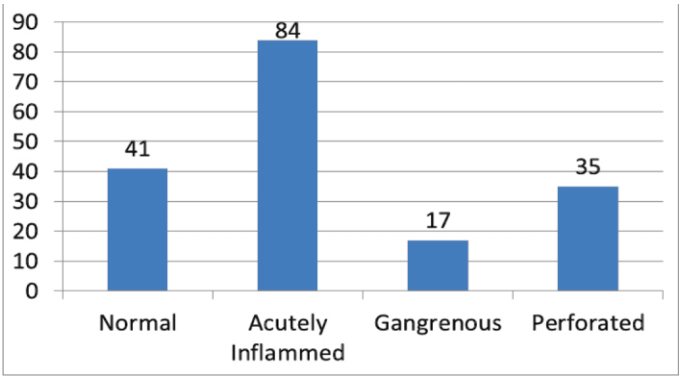


Figure 1: *Intra Operative Findings*

Table 1: *Stratification of histopathology with Alvarado score and PAS*

	Normal	Acutely Inflammed
Alvarado Score upto 7	15	68
Alvarado Score more than 7	3	91
P Value = 0.001		
PAS upto 7	6	55
PAS more than 7	12	104
P Value = 0.570		

Table 2: *Mean Alvarado Score and PAS in Cases having Acute Appendicitis*

	Normal	Acutely Inflammed	P-Value
Alvarado Score (mean)	5.277	7.37	0.000
Pediatric Appendicitis Score (mean)	7.277	7.68	0.325

Table 3: *The sensitivity and Specificity of Alvarado Score & PAS for Three Strata Including: Score 3-5, 5-7 and 8-10*

		3-5	6-7	8-10
Alvarado	Specificity	23.9%	18.8%	57.2%
	Sensitivity	38.8%	77.7%	83.3%
PAS	Specificity	8.8%	25.7%	65.4%
	Sensitivity	83.33%	83.33%	33.3%

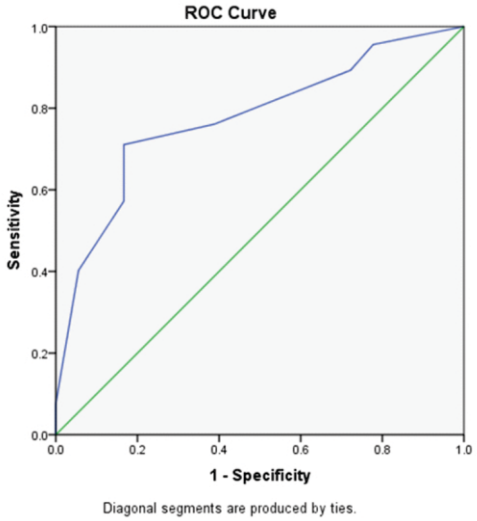


Figure-2: *Receiver Operator Characteristic Curves: Alvarado*

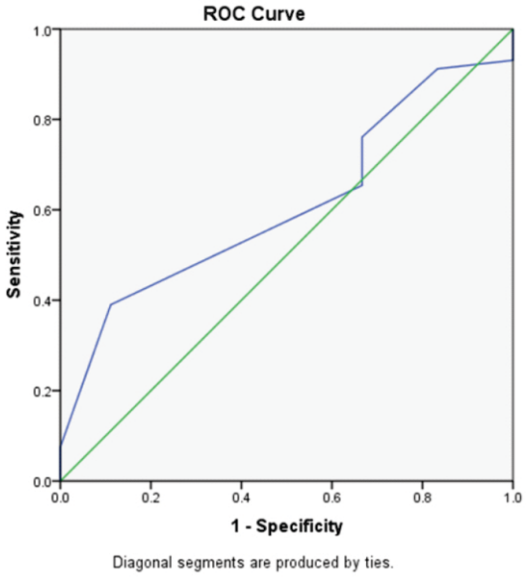


Figure-3: Receiver Operator Characteristic Curves: PAS

Discussion

AA is one of the most common surgical diseases seen in surgical emergency however it can be often challenging for surgeon to make a correct diagnosis in order to reduce the chance of negative exploration for acute appendicitis.[9] It very important to differentiate pain abdomen secondary to inflammation of appendix from other causes, which is often a difficult task especially in children.[10] Early and accurate diagnosis reduces the rate of post-operative morbidity & mortality. The diagnosis of appendicitis is mainly clinical with help from radiology and laboratory may be needed for confirmation. Over time many scoring systems had been developed and Alvarado score is one of the most widely used tool for the diagnosis of appendicitis in adults but it is showed varied results in children. It consists of eight clinical and laboratory assessment items.[11] In 2002 PAS was developed by Samuel for children between 4 to 15 years of age it is a modification of Alvarado Score and carries a maximum score of 10.8 In this study we tried to compare a well reputed Alvarado scoring system with pediatric appendicitis score with regard to correct diagnosis based on operative findings.

We found out the mean age of the patients was 9.16 ± 2.386 years. It was comparable with Samuel who reported in cohort for development of PAS.[12] In current study the difference in mean Alvarado score between having acute appendicitis and those with normal histopathology was significant($P < 0.001$), while this difference in mean PAS was not found significant (p- 0.57). But a similar study showed significant P-Value ($P < 0.001$) for both Alvardo & PAS in relation to appendicitis versus normal appendix.[13]

In present study, the sensitivity and specificity of both Alvarado score and PAS for three strata including score 3-5, 5-7 and 8-10 were 23.9%, 18.8%, 57.2% and 8.8%, 25.7%, 65.4% respectively. Pogorelic et al reported that in 236 patients (sensitivity, 89%; specificity, 59%; positive predictive value, 93.1%), whereas in patients with acute appendicitis and a PAS of 7 or higher, the correct diagnosis would have been set in 228 patients (sensitivity, 86%; specificity, 50%; positive predictive value, 90.1%). No significant difference was found in sensitivity and specificity between the observed scoring systems they suggested that these scores can only provide assistance.[14] However a study by Kim in adults showed, the sensitivity of the Alvarado score 86.2%, its specificity 61.6%, and the accuracy

of diagnosis was 82.9%.[15] Another study publishd in an Indian journal reported that The sensitivity of PAS was 0.87, specificity 0.59, positive predictive value 0.83, and negative predictive value 0.67. This study concluded that the PAS score had 17% negative appendicectomy rate of and an unacceptable 13% of patients with appendicitis being missed.[16]

Our results are comparable to Badebarin D et al., who reported that although the diagnostic value of Alvarado score is higher as compared to PAS but the sensitivity, specificity , PPV , NPV are not satisfactory for conformation of diagnosis.[17]

Conclusion

Both the scores failed to show the desired sensitivity and specificity and therefore it was concluded that clinical assessment should be done for making the final diagnosis.

Conflict of Interest: None

References

1. Almaramhy HH. Acute appendicitis in young children less than 5 years: review article. Ital J Pediatr. 2017 Jan 26;43(1):15. doi: 10.1186/s13052-017-0335-2. PMID: 28257658; PMCID: PMC5347837.
2. Dogra BB. Acute appendicitis: Common surgical emergency. Medical Journal of Dr. DY Patil University. 2014 Nov 1;7(6):749
3. Gadiparthi R, Waseem M. Pediatric Appendicitis. [Updated 2019 Dec 16]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from:
4. Kim D, Butterworth SA, Goldman RD. Chronic appendicitis in children. Can Fam Physician. 2016 Jun; 62 (6): e304-5. PMID: 27303020; PMCID: PMC4907572.
5. Jones K, Pena AA, Dunn EL, et al. Are negative appendectomies still acceptable? Am J Surg 2004; 188: 748e754.
6. Naoum JJ, Mileski WJ, Daller JA, et al. The use of abdominal computed tomography scan decreases the frequency of misdiagnosis in cases of suspected acute appendicitis. Am J Surg. 2002;184:587-589.
7. Brown TW, McCarthy ML, Kelen GD, et al. An epidemiologic study of closed emergency department malpractice claims in a national database of physician malpractice insurers. Acad Emerg Med.2010; 17(5): 553--560.
8. Bergeron E. Clinical judgment remains of great value in the diagnosis of acute appendicitis. Can J Surg. 2006; 49(2):96--100.
9. Derakhshanfar H, Pourbakhtyaran E, Rahimi S, Sayyah S, Karbasian F, Soltantooyeh Z, Fallah S. Survey of efficacy of pediatric appendicitis score in Iranian patients less than 18 years old referred to the emergency department. J Family Med Prim Care. 2019 Nov 15; 8(11):3700-3705. doi: 10.4103/ jfmpc.jfmpc_740_19. PMID: 31803676; PMCID: PMC6881965.
10. Kalan M, Talbot D, Cunliffe WJ, et al. Evaluation of the modified Alvarado score in the diagnosis of acute appendicitis: a prospective study. Ann R Coll Surg. 1994;76:418–419
11. Pogorelic Z, Rak S, Mrklic I, Juric I. Prospective validation of Alvarado score and Pediatric Appendicitis Score for the diagnosis of acute appendicitis in children. Pediatric emergency care. 2015 Mar 1;31(3):164-8.
12. Goulder F, Simpson T. Pediatric appendicitis score: A retrospective analysis. J Indian Assoc Pediatr Surg. 2008;13(4):125-127. doi:10.4103/0971-9261.44761
13. Parveen KZ, Avabratha KS, Shetty K. Pediatric appendicitis score in the diagnosis of childhood appendicitis: a validation study. Int J Contemp Pediatr. 2017 Nov; 4(6): 2196.
14. Teixeira PG, Sivrikoz E, Inaba K, Talving P, Lam L, Demetriades D. Appendectomy timing: waiting until the next morning increases the risk of surgical site infections. Annals of surgery. 2012 Sep 1;256(3):538-43.
15. Chung PH, Dai K, Yang Z, Wong KK. Validity of Alvarado Score in predicting disease severity and postoperative complication in pediatric acute appendicitis. World Journal of Pediatric Surgery. 2019 Feb 1;2(1).
16. Rajbhandari B, Dahal GR, Pokharel RP. Comparison Between Alvarado Score and Paediatric Appendicitis Score in Diagnosing Acute Appendicitis in Children. Journal of Nepal Paediatric Society. 2020 Dec 15; 40(3):178-84.
17. Badebarin, D., Parsay, S., & Aslanabadi , S. (2020). Alvarado vs. Pediatric Appendicitis Score (PAS) in Acute Appendicitis of Children. Iranian Journal of Pediatric Surgery, 6(1), 1-9. https:// doi.org/ 10.22037/ irjps.v6i1.31696

Authors Contribution

N.L: Conceptualization of Project

A.I, Z.A: Data Collection

W.Ur.R: Literature Search

F.B: Drafting, Revision

S.H.D: Literature Search

Original Article

Knowledge, Attitude and Practices Regarding COVID-19 among Postgraduate Trainees and House Officers

Shandana Tarique,[1] Shahid Sarwar[2]

Abstract

Objective: To assess the knowledge, attitude and practice among house officers and post graduate trainees towards COVID-19 in tertiary care hospitals.

Methods: An online questionnaire was used as research tool to collect data from 115 house officers and post graduate trainees working in tertiary care hospitals. Questionnaire was divided into three sections. Knowledge was assessed on basis of choosing the best option, attitude was evaluated with agree/disagree and practices were considered on yes/no format. Data was analyzed with SPSS 24®(Armonk NY:IBM corp).

Results: 115 doctors responded to online survey. Mean age was 26.92±2.92, 62(53.9%) were female and 53(46.1%) were male. Regarding the status of participants, 46(40%) were house officers and 69(60%) were post graduate residents. Considering the domain of knowledge, maximum score was 12 and minimum was 4.Mean score was 8.75. It was observed that 82(71.3%) participants agreed that COVID-19 will be successfully controlled, while 114 (99.1%) of participants counselled patients and their attendants about preventive measures. Regarding practice domain, 110(95.7%) participants replied in affirmative that they wore mask when leaving home while 19(16.5%) had undergone training for nasopharyngeal sample collection. Only 45(39.1%) had undergone training for doffing and donning.

Pearson correlation was applied between the three domains and status of doctors. It was observed that postgraduate residents were significantly better in Covid-19 related knowledge ($p<.05$). Among the three domains, no significant relationship was observed.

Conclusion: Doctors have positive attitude though factors have been identified in knowledge and practice that need improvement.

Key words: COVID-19, knowledge, attitude, practice

How to cite: *Tarique S., Sarwar S., Knowledge, Attitude and Practices regarding COVID-19 among Postgraduate Trainees and House Officers. Esculapio 2021;17(02):179-182.*

DOI: ***https://doi.org/10.51273/esc21.2517214***

Introduction

Emergence of infection due to novel corona virus has drastically modified life style globally. In December 2019, a new strain of virus was reported to be causing an outbreak in city of Wuhan in China. It was reported to cause pneumonia like illness with certain radiological and hematological characteristics.[1] This disease is labelled in nomenclature as coronavirus disease (COVID-19) by WHO and the reference name given to the virus is severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[2] Its rapid global spread led World Health Organization (WHO) to declare it as pandemic. Its high virulence and contagious nature made it major health emergency world-wide.

Corona virus are group of virus that cause diseases primarily related to respiratory symptoms. They are single stranded RNA virus. Novel virus is new version of SARS virus. It is considered that constant evolutionary process within different species or exposure to host environment, by mutation and eventual adaptation to a susceptible host has led to the new form of the viable pathogen.[3]

According to WHO, as of 23rd February 2021; 223

1. Shandana Tarique 2. Shahid Sarwar
1,2. Department of Medicine, Allama Iqbal Medical College, Lahore

Correspondence:
Dr.Shandana Tarique, Associate Professor of Medicine, Allama Iqbal Medical College, Lahore. E-mail: shandanatarique@gmail.com

Submission Date: 03-05-2021
1st Revision Date: 10-05-2021
Acceptance Date: 20-05-2021

countries have been affected, 111279860 confirmed cases have been reported and death toll stands at 2466639 cases[4]. Pakistan reported its first case on 26th February 2020. By 23rd February 2021, Pakistan has more than five lakh confirmed cases.[5]

In event of major outbreaks, health care system has to bear the brunt. Health care workers form the backbone of a health facility. They are on the frontline and have to be prepared to deal with such emergencies. Doctors play critical role in management of these patients. Given the contagious nature of this disease, they themselves become vulnerable target. The exposure to the virus can lead to illness in doctors and unfortunately can prove fatal in critical condition. As of early March, 3300 health care workers were infected in China. In Italy, 20% of health care responders were infected.[6] It directly affects the workforce required for smooth running of health institution. At individual level, it is cause of physiological and psychological stress. Awareness in terms of knowledge, attitude and practices of medical illnesses is essential for a doctor. Same holds true for pandemic of COVID-19. Adequate knowledge, appropriate attitudes and standard practices help in streamlining the management along with personal protection. Some studies have been conducted to evaluate data regarding knowledge, attitude and practices among various sections of society. One such study was conducted by Zhong et al in which participants were residents of Hubei province, China. The study summarized that gender and socioeconomic status affected the responses[7]. Another study was carried out on Iranian population regarding novel Corona virus outbreak[8]. Saqlain et al conducted KAP study among health care professionals including physicians, nurses and pharmacists. They observed positive attitude and sound practices. The results showed that age, experience and nature of job were significantly associated with the parameters of knowledge and practices[9].

Considering the reported high infectivity of doctors, it is hypothesized that the knowledge, practice and attitude may be deficient. For this purpose, a questionnaire was designed to assess knowledge, attitude and practices of doctors regarding COVID-19. The target population was post graduate trainees and house officers who form vital and crucial part of health care delivery system. They are the force working at fore front in the pandemic due to novel Corona virus. The study was planned and carried out during initial period of pandemic. The rationale of the study was to identify and define deficiencies in knowledge, attitude and practices of post graduate trainees and house officers towards COVID-19.

Data Collection Procedure

This cross sectional study with web based survey was carried out among house officers and post graduate residents in tertiary care hospitals of Lahore, Pakistan from June 2020 to August 2020. After approval of Ethical Review Committee Allama Iqbal Medical College Lahore, data was collected via online questionnaire. Questionnaire was prepared using online Google Forms as a tool. Link was shared with participants through email, WhatsApp and Facebook. Clarity of language was assessed by running pilot study on 20 doctors. Informed consent was taken as part of questionnaire. Questionnaire was divided into sections. Demographic profile including age, gender, academic status, training duration and name of institution were documented. Questions were divided into sections pertaining to domains of knowledge, attitude and practice regarding COVID-19. Section on knowledge contained fourteen questions (K1-K14). Third section had three questions (A1-A3) related to attitude and fourth section had six questions concerned with practices (P1-P6). K1-K14 questions have choose the best option format. A1-A3 and P1-P6 have agree/disagree and yes/no format respectively.

Data Analysis

Data analysis was done with SPSS 24®(Armonk NY:IBM corp). Numerical variables like age was presented as mean ± SD. For questions K1-K14, score of 1 was assigned to correct answer. Nominal variables like gender, academic status and responses for knowledge, attitude and practices were presented as frequency and percentages. Score of more than 50% was representative of positive attitude. Scores of three domains were correlated with gender, academic status and training duration by applying Pearson Correlation statistics. P value of < 0.05 was considered significant.

Results

115 doctors responded to online survey. Mean age was 26.92±2.92, **(Fig-1)** 62(53.9%) were female and 53(46.1%) were male. Regarding the status of participants, 46(40%) were house officers and 69(60%) were post graduate residents. Inter-rater reliability was 85.6%.There were fourteen questions

related to cognitive assessment of covid infection. Maximum score was 12 and minimum was 4. Mean score was 8.75. Highest score of 12 (85.7%) was noted in five (4.3%) responders. Maximum correct response was for the most common clinical feature (99.1%). Least response was for sequence of donning **(Table-1)**. Considering the attitude, response to three questions was required. Participants had to choose between option "agree" and "disagree". It was observed that 82(71.3%) participants agreed that COVID-19 will be successfully controlled. 114(99.1%) of participants were counselling patients and their attendants regarding preventive measures. Regarding query about whether personal information of positive cases should be made public, 64(55.7%) agreed that it should be made public. In section regarding practice, six questions were asked and response was generated in form of options of "yes" or "no". Survey showed

Table 1: *Correlation between Professional Status and the Domains*

		status	Know-ledge	Prac-tice	Totaka-ttitude
status	Pearson Correlation	1	-.326**	.055	.081
	Sig. (2-tailed)		.000	.559	.392
	N	115	115	115	115
Know-ledge	Pearson Correlation	-.326**	1	-.053	-.011
	Sig. (2-tailed)	.000		.575	.904
	N	115	115	115	115
Prac-tice	Pearson Correlation	.055	-.053	1	.073
	Sig. (2-tailed)	.559	.575		.439
	N	115	115	115	115
Totaka-ttitude	Pearson Correlation	.081	-.011	.073	1
	Sig. (2-tailed)	.392	.904	.439	
	N	115	115	115	115

****. Correlation is significant at the 0.01 level (2-tailed).**

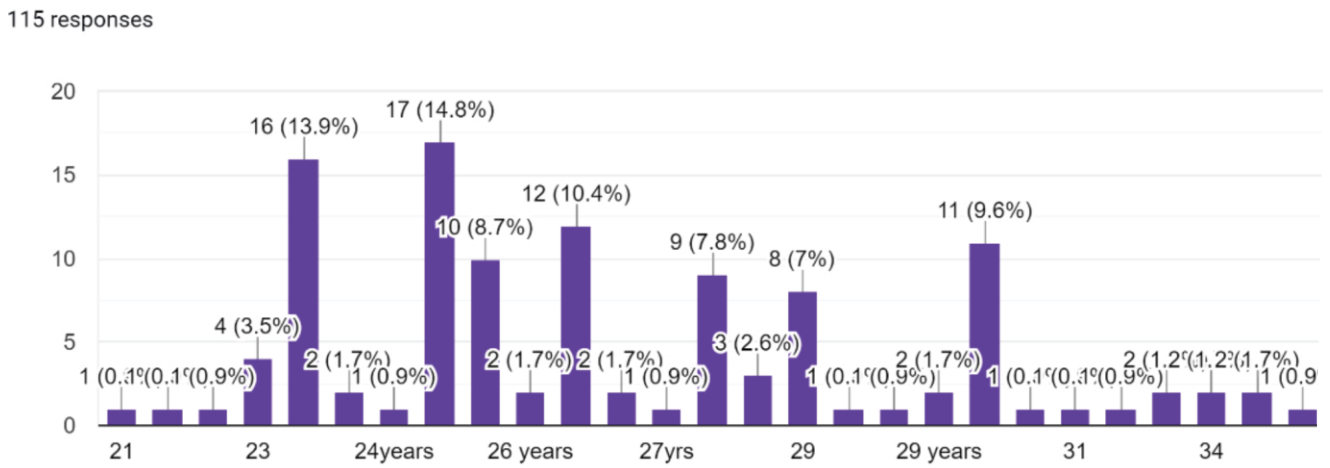


Figure-1 *Age distribution among participants*

that 59(51.3%) answered in affirmative regarding recent visits to crowded places. 110 (95.7%) wore mask when leaving home while 19(16.5%) had undergone training for nasopharyngeal sample collection. Only 45(39.1%) had undergone training for doffing and donning. Contact with covid positive cases was documented in 37(32.2%) during data collection period. Scrubs were worn by 72(62.6%).

Pearson correlation was applied between the three domains and status of doctors. It was observed that postgraduate residents were significantly better in Covid-19 related knowledge ($p<.05$). Among the three domains, no significant relationship was observed.

Discussion

This study aimed at knowledge, attitude and practices of doctors regarding covid-19 outbreak Study was carried out at the time when Pakistan was experiencing first wave of COVID infection. Covid-19 pandemic has highlighted the importance of knowledge of emerging advances in medical field. Study was carried out at the time when Pakistan was experiencing first wave of COVID infection. Doctors are the front line workers. They have to manage the patients suffering from the disease. They themselves are vulnerable to fall prey to this viral infection. This highlights the importance of personal safety. Various countries have conducted such surveys. One study was carried out in Nepal. The study involved doctors, nurses and paramedics. Our

study focused on doctors. 76% of participants had adequate knowledge, while in our study 4.3% scored 85.7%. In Nepalese study, 54.7% and 78.9% had positive attitude and app-ropriate practice approach regarding COVID-19.[10] Our study documented positive attitude though practice approach was not adequate. This fact can be explained by lack of awareness and training techniques. In another study conducted in a tertiary care hospital in Nepal, it was concluded that knowledge attitude and practice regarding COVID had positive relationship with age.[11] In our study post graduate residents had significantly better knowledge than house officers.

A local perspective was expressed in a study carried out in Karachi. Study had 414 participants. Analysis showed sound knowledge (93.2%), attitude and practice (88.7%); though gaps were identified in certain fields[12]. Our study found that most of the participants lacked knowledge regarding social distancing or treatment options. Positive attitude was observed though practice domain reflected deficiency in training regarding preparation to deal with pandemic.

A study by Salman et al was carried out among health care professionals in which doctors were found to have better knowledge with overall score of 75.5%. Our study involved two tiers of doctors i.e. house officers and post graduate residents and highest score was 85.7%. In the same study practice skills were found to be satisfactory in 73.4% of participants.[13]

Conclusion

According to the response of the participants, positive attitude is present in most of the doctors though gaps have been identified in knowledge and practice that need improvement.

Conflict of Interest: None

References

1. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia. New England Journal of Medicine. 2020;382(13):1199-1207.
2. Voice from China. Chinese Medical Journal. 2020; 133(9):1012-1014.
3. Das P, Choudhuri T. Decoding the global outbreak of COVID-19: the nature is behind the scene. Virus Disease. 2020;. https://doi.org/10.1007/s13337-020-00605-y.
4. Coronavirus disease (COVID-19)–World Health Organization [Internet]. Who.int. 2021 [cited 23 1. Coronavirus disease (COVID-19) – World Health Organization [Internet]. Who.int. 2021 [cited 23 February 2021]. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019?gclid= CjwKCAjwxev3BRBBEiwAiB_PWHKC8mLCiuPi1C5vLew1KSevXk5pA-NNyA_Wn61sbQK3mpIsbDlJOhoCjIUQAvD_2021].
5. [Internet]. Covid.gov.pk. 2021 [cited 1 July 2021]. Available from: http://covid.gov.pk/
6. Editorial. COVID-19: protecting health-care workers. Lancet. 2020; 395(10228):922. doi: 10.1016/ S0140-6736 (20)30644-9.
7. Zhong B, Luo W, Li H, Zhang Q, Liu X, Li W et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. International Journal of Biological Sciences. 2020;16(10):1745-1752.
8. Erfani A, Shahriarirad R, Ranjbar K, Mirahmadizadeh A, Moghadami M. Knowledge, Attitude and Practice toward the Novel Coronavirus (COVID-19) Outbreak: A Population-Based Survey in Iran. [Internet]. 2020 [cited 8 July 2020];. Available from: https://www.who.int/bulletin/online_first/20-256651.pdf.
9. Saqlain M, Munir M, Rehman S, Gulzar A, Naz S, Ahmed Z et al. Knowledge, Attitude and Practice among Healthcare Professionals regarding COVID-19: A cross-sectional survey from Pakistan [Internet]. Medrxiv.org. 2020 [cited 8 July 2020]. Available from: https://www.medrxiv.org/content/10.1101/ 2020.04.13.20063198v1.full.pdf
10. Tamang N, Rai P, Dhungana S, Sherchan B, Shah B, Pyakurel P et al. COVID-19: a National Survey on perceived level of knowledge, attitude and practice among frontline healthcare Workers in Nepal [Internet]. 2021 [cited 10 February 2021]. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-10025-8
11. Limbu D, Piryani R, Sunny A. Healthcare workers' knowledge, attitude and practices during the COVID-19 pandemic response in a tertiary care hospital of Nepal. PLOS ONE. 2020;15(11):e0242126.
12. Saqlain M, Munir M, Rehman S, Gulzar A, Naz S, Ahmed Z et al. Knowledge, attitude, practice and perceived barriers among healthcare workers regarding COVID-19: a cross-sectional survey from Pakistan. Journal of Hospital Infection. 2020;105(3):419-423.
13. Salman M, Mustafa Z, Asif N, Zaidi H, Shehzadi N, Khan T et al. Knowledge, attitude and preventive practices related to COVID-19 among health professionals of Punjab province of Pakistan. The Journal of Infection in Developing Countries. 2020;14(07):707-712.

Authors Contribution

S.T: Conceptualization of Project, Writing of Manuscript, Literature Search

S.S: Statistical Analysis, Drafting, Revision, Data Collection

Patient Denialism for COVID19 Pose Difficulty for Treating Physicians

Rizwan Pervaiz,[1] Muhammad Asim Rana,[2] Mohammad Ahad Qayyum,[3] Ali Munawar,[4] Sana Tariq,[5] Abdullah Ali Lashari[6]

Abstract

Objectives: As patients refusal has been a major issue in diagnosing the disease, we carried out this study to determine the magnitude of the refusal or denial of suspected COVID 19 cases.

Methods: All patients seen with COVID 19 symptoms in medical out doors and emergency in Bahria International Hospital, Lahore in two weeks period from April 15, 2020 to April 30, 2020 were included in study. COVID 19 symptoms were ascertained on WHO guidelines labelling patients as COVID 19 suspected through laboratory tests. Depending upon results individual consultation with each patient was arranged to convince them to carry out nasopharyngeal swab for SARS Co-V-2 PCR. Some patients refused despite counselling for follow up regarding symptoms and advised tests. The public fear was the main barrier for the suspected cases to get tested. Each patient who refused PCR test was labelled as in denial.

Results: Of the 40 cases diagnosed as suspected COVID 19. 21 refused to get tested. Majority (15) were male.Fever with chills was common among all with majority presented with shortness of breath (43%) followed by diarrhea (33%) and chest pain (9%).

Conclusion: Patients who remain in denial pose a great threat to society as by spreading the virus or deteriorating themselves. An effective campaign on government level should be run to overcome the fear which has made this infection a social stigma to help contain this pandemic in a resource scarce country like Pakistan.

Keywords: Coronavirus denial, COVID-19 denial, COVID in Pakistan, Public reaction to COVID 19

How to cite: *Pervaiz R., Rana A.M., Qayyum A.M., Munawar A., Tariq S., Lashari A.A. Patient denialism for COVID19 pose difficulty for treating Physicians. Esculapio 2021;17(02):183-186.*

DOI: ***https://doi.org/10.51273/esc21.2517215***

Introduction

With the surging rate of spread of the novel Corona-virus-19 around the globe, each country has had to take measures to contain the spread. Most notable is the marked variation in strategies adopted by each individual country ranging from Sweden at one end of spectrum wherein all primary schools and restaurants remained open as per normal routine to the other end of the spectrum wherein Saudi Arabia imposed a curfew in its cities.[1,2] Each strategy had its own merits and demerits which are not within the purview of this discussion. However, whatever strategy adopted there has been a variable but consistent mental baggage attached to the COVID-19 pandemic in every country. This mental baggage has ranged from denial to downright major depressive illness.[3]

With the strategies adopted by Pakistan, health professionals at our facility have noted a significant amount of denial in patients suspected to have COVID-19 resulting in an outright refusal to get tested. This denial and refusal to accept their COVID related symptoms and to seek a management plan is a conundrum because at one hand lies the basic human right of each individual over his/her own health while on the other lies the fact that this person could potentially be a health hazard to the general public at large. This study sheds light on the magnitude of the problem whereby patients suspec-

1. Rizwan Pervaiz
2. Muhammad Asim Rana
3. Mohammad Ahad Qayyum
4. Ali Munawar
5. Sana Tariq
6. Abdullah Ali Lashari

1-2: Department of Internal and Critical Care Medicine, Bahria International Hospital, Lahore, Pakistan
3. Department of Nephrology, division of Medicine, Bahria International Hospital, Lahore, Pakistan
4-5: Department of Internal and Critical Care Medicine, Bahria International Hospital, Lahore, Pakistan
6. Department of Anesthesia and Critical Care, Bahria International Hospital, Lahore, Pakistan

Correspondence:
Dr. Rizwan Pervaiz, *Department of Internal and Critical Care Medicine, Bahria International Hospital, Lahore, Pakistan*
Email: drrizwanpervaiz@gmail.com

Submission Date: 14-02-2021
1st Revision Date: 04-03-2021
Acceptance Date: 15-04-2021

ted to have COVID 19 refuse to accept standard deviation was calculated for continuous the diagnosis. Furthermore, refuse to get tested to get a confirmed diagnosis.

Methods

All consecutive patients seen for COVID related symptoms seen in our medical unit over a 2-week period were included in the study. These included patients who were referred from the COVID 19 help desk located at the gate of the hospital, emergency unit as well as those who walked in to receive treatment. The medical specialists ascertained COVID 19 related symptoms based on World Health Organization guidelines; and labeled the patient's status as a "suspected COVID 19 case" as per international definition(4). To further support the suspected diagnosis of a COVID 19 case each patient underwent a hematology and biochemical workup indirectly indicative of COVID 19 which looked for lymphocytopenia, raised C reactive protein, raised D-dimers, raised ferritin and normal pro-calcitonin levels.[5,6]

Each patient was given a minimum 15 minute consultation with the medical consultant on-call to explain the probable diagnosis and what should be the management plan ahead including diagnostics, treatment option and the possibility of quarantine as per Government of Punjab's instructions.[7] Only hemodynamically stable patients who did not require inotropic or mechanical ventilation were included in the study. Critical patients requiring admission in the intensive care unit were excluded, as they required mandatory testing.

A patient who refused to get tested despite 15-minute intensive counselling by medical consultant was labeled to be in denial of his/her underlying suspected COVID 19 diagnosis.

Results

A total of 40 outdoor patients in our medical unit were given a diagnosis of "suspected COVID 19" over the 2 weeks study period. 21 cases out of these 40 remained in denial and refused to get tested by nasopharyngeal RT PCR for COVID 19. Amongst these 21 patients, 15 were male and 6 were female. The average age was 51.4 years **(Table 1)**.

All patients shared a history of fevers with chills preceding their presenting complaint. The majority of the patients presented with complaints of shortness of breath (43%) followed by diarrhea (33%), chest pain (9%), and one patient each presented with simply

Table 1: *Demographic Data of Patients of Suspected COVID in Denial*

Male Patients:	15	**Male: Female ratio**	2.5:1
Female Patients:	6		
Minimum Patient Age:	83	**Average age:**	51.4286
Maximum Patient Age:	14		

fever, lethargy or abdominal pain **(Fig-1)**.

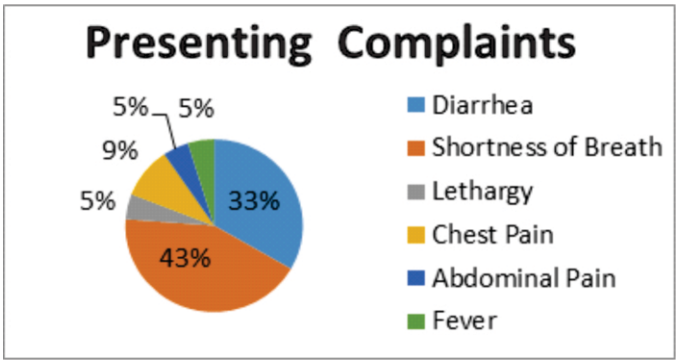


Figure 1: *Figurative Description of Major Presenting Complaints of Patients.*

The laboratory investigations in each patient included pointed towards the possibility of a COVID 19 infection **(Table-1)**.

Additionally, some laboratory results were strikingly high (D-Dimers with a maximum value of 10000.28, Ferritin at 1207.72 and LDH at 1045).

Table 2: *Laboratory Parameters of Suspected COVID Cases Indicating Possibility of COVID*

Parameter	Major/ Max	Minor/ Min	Average
Age	83	14	51.43
WCC	17.6	6.37	11.46
Lymphos	48	3	15.80
CRP	336.8	1.05	93.58
D-Dimers	10000.28	159	1316.15
LDH	1045	125	346.00
Albumin	4.5	0.7	3.00
ALT	2086	13	184.59
AST	4078	10	287.41
Ferritin	1207.72	33.6	391.88
Creatinine	7.2	0.5	2.13

Discussion

Biswas, Drogin, & Gutheilvery prudently stated, "treatment delayed is treatment denied". Although while Biswas et al. were implicating the medical fraternity as the cause of the delay; the current COVID 19 situation in Pakistan seems to suggest that the shoe is on the other foot here with the patients causing a delay in their own treatment. Furthermore, it is not the delay in treatment alone, which is distressing, as the denial creates a barrier

between treating physician and patient and he/she is not willing to take even the symptomatic treatment and questions all the prescribed drugs anticoagulation for instance in case of raised D-Dimers, but the fact that the patients refusing to get tested or treated in the first place get to roam free in the general public and being in denial do not follow isolation precautions making them a significant health risk.[8]

This refusal to get tested stems from a general sense of denial that he/she has or could possibly have acquired the virus. Personal experiences revealed that when the discussion was opened to the probability of COVID infection and we tried to convince these patients to get their COVID PCR done, all of them denied the possibility of having contracted the virus, and some went on to blame the physicians for "deliberately labeling them as COVID victims". All of these patients lost the follow up after having left the medical facility after this discussion despite being requested to think over their decision and come back.

The distressingly aggressive rate of the spread of the COVID-19 disease due to the novel Coronavirus is almost universal knowledge due to the corroboration and documentation provided by a multitude of international sources.[9] The virus in question has infected 212 countries and territories, which is over 84% of all the countries and territories as recognized by the United Nations.

The first two cases of COVID-19 in the Islamic Republic of Pakistan were reported in Karachi, on the 26th of February, 2020, and by the time of writing this paper, May 25th 2020, the number of cases has escalated beyond 56,000 confirmed cases across all the provinces. Over this period of only around 90 days, Pakistan has experienced the loss of 1167 lives.[10]

The most exponential of this increase has been in recent days. Government response has varied over the time period as the information about this novel virus were evolving in an effort to control the disease, but sufficient measures to control the disease have not yet been achieved. Parts of the country have been placed under lockdown and social distancing has been encouraged, as it has been attested as the most efficient way to control the spread of infection.[11] Unfortunately, the common folk have not all adopted stern social distancing methods due to the social taboo that has surrounded the virus and disease, owing in part to public psychology and in part to culture.

Many people are still in denial of the severity of the disease and its rate of spread, while others ignore their symptoms and avoid being tested. There are several reasons for this, including public fear, religious clergies and poverty. Some religious clergies have denied the gravity of the virus and continued to hold congregations over this period, due to which the people following them have also continued to go about their lives normally without precaution. This has, without a doubt, contributed to the increase in cases.

The people that tend to ignore their symptoms and avoid sharing their concerns have anxieties related to becoming social pariahs and the inability to pay for tests and treatment. The social taboo surrounding the disease and the fear that people have associated with it induces lack of empathy towards infected patients and creates an air of blame surrounding them, as if they are more criminals than chance victims of this plague. This is, quite largely, due to the way patients are handled in government response. People are taken out of their houses to be put in government quarantine unannounced and at all possible hours. Upon returning home after their isolation period, the method of their initial removal has often alienated them from their neighbors, making it difficult for them to fit back into society.[12]

There are also many people, both young and old, who have an unrealistic optimism bias, believing themselves to be more resistant and somehow immune to the disease.

Conclusion

The data presented in this document is of a small patient group from just one hospital of many in the country. It can be assumed that multiple groups like such exist, and in their refusal of acknowledging their symptoms, they pose a threat to society in the case that they do not self-isolate, as well as to medical staff.

Conflict of Interest None

References

1. Team EE. Latest updates on COVID-19 from the European Centre for Disease Prevention and Control. Eurosurveillance. 2020;25(6).
2. Al-Tawfiq JA, Memish ZA. COVID-19 in the Eastern Mediterranean Region and Saudi Arabia: prevention and therapeutic strategies. International Journal of Antimicrobial Agents. 2020;55(5):105968.
3. Torales J, O'Higgins M, Castaldelli-Maia JM, Ventri-

glio A. The outbreak of COVID-19 coronavirus and its impact on global mental health. International Journal of Social Psychiatry. 2020:0020764020915212.

4. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, evaluation and treatment coronavirus (COVID-19). Statpearls [internet]: StatPearls Publishing; 2020.
5. Terpos E, Ntanasis-Stathopoulos I, Elalamy I, Kastritis E, Sergentanis TN, Politou M, et al. Hematological findings and complications of COVID-19. American journal of hematology. 2020.
6. Zhu J, Ji P, Pang J, Zhong Z, Li H, He C, et al. Clinical characteristics of 3,062 COVID-19 patients: a meta-analysis. Journal of Medical Virology. 2020.
7. Sethi BA, Sethi A, Ali S, Aamir HS. Impact of Coronavirus disease (COVID-19) pandemic on health professionals. Pakistan Journal of Medical Sciences. 2020; 36(COVID19-S4).
8. Biswas J, Drogin EY, Gutheil TG. Treatment Delayed is Treatment Denied. J Am Acad Psychiatry Law. 2018; 46:447-53.
9. Organization WH. Naming the coronavirus disease (COVID-19) and the virus that causes it. 2020. URL https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it. 2020.
10. Yousaf M, Zahir S, Riaz M, Hussain SM, Shah K. Statistical analysis of forecasting COVID-19 for upcoming month in Pakistan. Chaos, Solitons & Fractals. 2020: 109926.
11. Kraemer MU, Yang C-H, Gutierrez B, Wu C-H, Klein B, Pigott DM, et al. The effect of human mobility and control measures on the COVID-19 epidemic in China. Science. 2020;368(6490):493-7.
12. Guan W-j, Ni Z-y, Hu Y, Liang W-h, Ou C-q, He J-x, et al. Clinical characteristics of coronavirus disease 2019 in China. New England journal of medicine. 2020;382(18):1708-20.

Authors Contribution

R.P: Conceptualization of Project

M.R, M.A.Q: Data Collection

A.M., S.T: Literature Search

A.A.L: Data Analyze

Comparison of 21 Days Versus 10 Days Bladder Catheterization after Hypospadias Repair

Muhammad Abdullah,[1] Muhammad Saleem,[2] Ghulam Mujtaba Zafar,[3] Farrukh Mehmood Sattar,[4] Imran Hashim,[5] Arslan Raza Wasti[6]

Abstract

Objective: To compare 21 days versus 10 days bladder catheterization after hypospadias repair.

Methods: After approval from ethical committee, Randomised controlled trial performed,in which 196 male patients were enrolled in the study that was conducted at department of pediatric surgery, Children hospital, Lahore. All patients underwent Snodgrass procedure. Group-1 patients were considered for 10 days bladder catheterization for hypospadias repair and group-2 patients were catheterized for 21 days. Complications were documented on follow-up visits in group 1 at 1 week (17 days), 3 weeks (34 days), and 6 weeks (51 days) after catheter removal. In group 2 at 1 week (day 28th), 3 weeks (day 42nd), 6 weeks (day 63rd) after catheter removal.

Results: The mean age in group-1 and group-2 was 7.25 ± 3.22 years and 6.29±3.02 years. There were significantly less cases of urethrocutaneous fistula in group 2 when compared to group 1. Urethro-cutaneous fistulas (UCF) developed in 13(13.26%) ,11(11.22%) and 10 (10.2%) cases at 1, 3, and 6 weeks post catheter removal follow up in group 1. While in group 2 UCF developed in 4 (4.08%), 3(3.1%) and 2(2.04%) at 1, 3, and 6 weeks follow up. There were 5(5.2%) and 4(4.1%) cases of post-operative wound infection in groups 1 and 2 respectively (p-value = 0.500). Wound dehiscence was seen in 1 (1.02%) case in group 1 and was not seen in group 2(p value =0.500). glans dehiscence was not seen in group 1 while 1 (1.02%) case seen in group 2 (p value 0.500).

Conclusion: We conclude that 21 days catheterization after hypospadias repair gives better outcome and fewer complications when compared to 10 days catheterization.

Keywords: Bladder catheterization; Hypospadias repair; Fistula formation.

How to cite: *Abdullah M., Saleem M., Zafar M.G., Sattar M.F., Hasnain I, Wasti R.A. Comparison of 21 Days Versus 10 Days Bladder Catheterization for Hypospadias Repair. Esculapio 2021;17(02):187-190.*

DOI: ***https://doi.org/10.51273/esc21.2517216***

Introduction

Hypospadias is regarded as quite common birth defect that affects 0.2–1% of male newborns.[1] The etiology of hypospadias remains unknown and is considered multifactorial (environmental, endocrine, genetic exposure).[2] Hypospadias is classified in various types on the base of meatus location i.e., glanular, sub coronal, coronal, distal, mid-penile, proximal, peno-scrotal, scrotal, and perineal. Hypospadias distal to mid penile shaft is called as anterior hypospadias that can usually be managed by single urethroplasty, especially Snodgrass tabularized incised plate (TIP) repair. Two-stage (BRACKA) is reserved for proximal hypospadias with severe chordee.[3] The successful hypospadias repair comprises of 5 chronological steps: (1) Orthoplasty or penile straightening, (2) Urethroplasty, (3) Meatoplasty and Glanuloplasty, (4) Scrotoplasty, and (5) Coverage of the skin. There is a great controversy about urinary diversion after hypospadias repair. Three main protocols are being used regarding catheteriza-tion for hypospadias repair. First supra pubic drainage to avoid severe complications resulting from leakage of urine at the suture lining.[4] Second per urethral catheter to the urinary bladder for about 10 days.[5] and third some surgeons

1. Muhammad Abdullah
2. Muhammad Saleem
3. Ghulam Mujtaba Zafar
4. Farrukh Mehmood Sattar
5. Imran Hashim
6. Arslan Raza Wasti

1-6: Department of General Surgery, Children Hospital, Lahore.

Correspondence:
Dr. Muhammad Abdullah, *Department of General Surgery, Children Hospital, Lahore.*

Submission Date: 04-05-2021
1st Revision Date: 17-05-2021
Acceptance Date: 27-05-2021

place the tube in the urethra almost distally to the position of bladder's external sphincter[6], few authors also reported no diversion[7]. Bleustein et al,. 2001 has reported that desmoplastic as well as infla-mmatory response is manifested in sutured repair even at 21st postop day.[8] Daher et al,. 2015 proved that allo-wing the bladder catheter for about "21" days rather than "7" days will significantly decrease the probability of UCF.[9] In their study, the fistula rate was three times less in the group where urinary catheter was left for 21 days compared to where stent was left for 7 days (Beustein et al,. 2001).

There is dearth of data on hypospadias repair and its complications in Pakistan. Only one study has been done previously. In our department, the usual protocol is 10 days catheterization after hypospadias repair. Given the benefits of prolonged catheterization, we wanted to conduct this study in our population to get local data and results. If it proves to be effective, the modification in catheterization can be proposed and implemented in hospitals of our country and will ultimately result in less rate of fistula formation.

Methods

This Randomized controlled trial was performed at pediatric surgery department in children hospital Lahore. We used lottery method to allocate the groups, so that bias and confounding factors could be minimized. All male of 1 to 14 years with sub-coronal, distal, mid-penile hypospadias without significant chordee, having normal labs were included in this study. After taking permission from ethical committee, 196 male patients fulfilling selection criteria were enrolled. Written informed consent was taken from parents/ attendants of each patient. All participants were examined physically by a surgery resident and attending physician. The study population was divided into 2 groups randomly using random number table. In group-1, patients were considered for 10 days bladder catheterization and in group-2, patients had 21 days bladder catheterization for hypospadias repair. All patients underwent TIP procedure by senior consultants to avoid bias. Regarding number of patients according to site of hypospadias are given in **table 4**. Each patient in both group was given same postope-rative care. Complications were documented during ward stay and outpatient clinic visits after removal of catheter at 1, 3, and 6 weeks. All the data was recorded on a self-structured proforma, demographic and other details was recorded. The qualitative data such as complications at each follow-up was presented as frequency distribution. Quantitative data in the study like age, was presented in form mean ± S.D (standard deviation). Chi-square test was applied to compare complications in both study groups. P-value ≤ 0.05 was considered as significant.

Results

The mean age of the patients was 6.77±3.15 years. The mean age in group-1 and group-2 was 7.25 ± 3.22 years and 6.29±3.02 years with similar age distribution in both study groups, p-value was insignificant. Details of Urethro-cutaneous fistulas development are shown in table 1 and details of rest of

Table 1: *Comparison of Postoperative Urethro-Cutaneous Fistulas in both Study Groups*

	Study Groups	1 Week	3 Weeks	6 Weeks
Urethro-cutaneous fistulas	Group 1	13(13.26%)	11(11.22%)	10(10.2%)
	Group 2	4(4.08%)	3(3.1%)	2(2.04%)
	P Value	*0.022*	0.027	0.017

Table 2: *Comparison of Postoperative Early Complication in both Study Groups. n=98*

	Group -1 n=98	Group-2 n=98	P-Value
Postoperative wound infection	5(5.2%)	4(4,1)	0.50
Wound dehiscence	1 (1.02%)	0	0.50
Glans Dehiscence	0	1(1.02%)	0.5

Table 3: *Comparing Complications According to Site of Meatus*

Complications	GROUP 1			GROUP 2		
	Sub coronal	Distal	Mid penile	Sub coronal	Distal	Mid penile
UC Fistula	0	5	5	0	0	2
Wound Infection	0	2	3	0	1	3
Wound Dehiscence	0	0	1	0	0	0
Glans Dehiscence	0	0	0	0	0	1

Table 4: *Group Distribution According to Site of Meatus*

	SUB CORONAL	DISTAL	MID PENILE
Group 1 (10 days)	16	57	25
Group 2 (21 days)	16	56	26

early complications are given in table 2.

Discussion

Hypospadias is reffered to an ectopically placed urethral aspect of penis or more proximal on scrotum to perineum.[10] Despite the advanced surgical techniques, postoperative complications may occur. These complications typically develop within 6 months of urethroplasty.[9] Various postoperative complications of any hypospadias repair may include edema, bleeding, urethral fistula, complete or partial disruption of the urethral repair, wound infection and dehiscence.[11,12] The most important comp-lication is urethra-cutaneous fistula and repair disruption which may require further surgeries for re-repair that often become more difficult due to scarring of local tissue making it more prone to complications.[13] Some authors advocated that catheter for 3 weeks may reduce fistula formation. In this context we carried out this study. In our study statistically difference in UCF in group l&2 10.2% & 2.04% (p-value 0.017) comparing with Daher 17.89% & 7.8% respectively.[9] While in another study Faustin et al., 2016 fistula rate was 8%.[14] Infection rate in our study was 5.2% & 4.1% (p-value 0.500) While in Faustin study infection rate was 8%.[14] Wound dehiscence in our study was 1.02% & 0% (p-value 0.500) in group 1 and 2 respectively, while in Faustin Partial or total breakdown of repair was 8% in patient with 3 weeks catheterization.[14] Glans dehiscence in our study was 0% & 1.02% (p-value 0.500) While in Faustin study Breakdown repair was 8%. In Daher study no postoperative wound infection, glans dehiscence or complete wound dehiscence was observed. A study by Daher et al., 2015 investigated role of duration of catheterization in hypospadias repair and found good results in terms of lesser postoperative complications especially urethral fistula in case of prolonged catheterization. The limitations of their study include its design, selection of patients, and duration of catheterization. I believe that each of these factors is an individual factor for development of complications and lack of randomization can create potential bias in the study.

Our study is randomized controlled trial and I have specified type of hypospadias to remove selection bias. Moreover we have used 10 days instead of seven days as I believe 7 days are too early for removal of catheter that theoretically increases risk of fistula formation.

In study of Daher P et al., 2015, they found fistula rate of 22.4% in patients where catheter was kept for 1 week whereas fistula rate of 7.4% in case of 3 weeks catheterization. The difference in fistula rate in their study was statistically significant. Our study endorses the results of Daher's study and our results can be considered more valuable on account of better planned study and good selection criteria and less chance of selection bias. In the index study, 10.2% cases got fistula with 10 days catheterization, and 2.04% of patients develop fistula with 21 days of catheterization (at 6 weeks after catheter removal). Arda et al., 2001 compared use of stent and catheter. The results showed that all stented patients strained at first voiding. Some patients showed pain, and only few showed voiding with in the first 8 hours. The catheterized group did not show any such problems. The findings also show that bladder catheterization can avoid these complications.[15] We study also showed better results with prolonged catheterization. The speculated benefits with prolonged catheterization could be complete absence of urinary leak in the peri-neourethral space due to prevention of direct voiding thus leading to prolonged time for proper healing of neo-urethra. Moreover, meatal stenosis is also prevented through the prolonged catheterization. Opponents of catheterization give opinion that it acts as foreign body and can detriment results.

Although no statistically significant difference was observed for secondary outcomes like wound infection, wound dehiscence (complete urethral dehiscence) or isolated glans dehiscence in both groups, the statistically difference in UCF in both groups favor prolonged catheterization. Prolonged catheterization may prevent meatal stenosis although this parameter was not studied in our series. Daher P et al., 2015 found less meatal stenosis cases in prolonged catheterization group although it was not statistically significant.

Bluestein et al., 2001 found that even by day-21 postoperatively, the sutured repair still presented with a desmoplastic and inflammatory response. This further supports our belief to leave the catheter till the 21st postoperative day.

Overall rate of complications was reported as 22.1% (n=21) for group 1 (1 week) while for group 2 (for 3 weeks) it was reported as 7.4% (n=7), [p=.005] (Daher P et al., 2015). The cases in group 1 presented with coronal fistulas more commonly as compare to the cases in group 2 ("13.7%" versus 3.2%) [P=.01]. We

in this study also found favorable results in group-2 when compared to group-1.

Conclusions

Through the findings of this study we conclude that 21 days catheterization for hypospadias repair gives better outcome and fewer complications when compared to 10 days catheterization. So paediatric surgeons should be encouraged to leave the catheter for 21 days instead of 10 days.

Conflict of Interest: None

References

1. Toppari J, Virtanen HE, Main KM, Skakkebaek NE. Cryptorchidism and hypospadias as a sign of testicular dysgenesis syndrome (TDS): environmental connection. Birth Defects Research Part A: Clinical and Molecular Teratology. 2010 Oct;88(10):910-9.
2. Kraft P, Vaché KB, Frede HG, Breuer L. CMF: a hydrological programming language extension for integrated catchment models. Environmental Modelling & Software. 2011 Jun 1;26(6):828-30.
3. Castagnetti M, El-Ghoneimi A. The influence of perioperative factors on primary severe hypospadias repair. Nature Reviews Urology. 2011 Apr;8(4):198.
4. Roushdy R, Sieverding M, Radwan H. The impact of water supply and sanitation on child health: Evidence from Egypt.
5. Arda IS, Mahmutoğlu M. Urethral catheterization in hypospadias surgery: Should the device enter the bladder or be made a urethral stent?. Journal of pediatric surgery. 2001 Dec 1;36(12):1829-31.
6. Ahmed N, Ahmed I, Faraz O, Safdar CA, Saleem M, Awan SH, Yusuf J. Comparison between urethroplasty with and without stent for hypospadias in terms of postoperative urethrocutaneous fistula formation. Pakistan Armed Forces Medical Journal. 2018 Dec 31;68(6): 1511-6.
7. El-Sherbiny DA, Khalifa AE, Attia AS, Eldenshary EE. Hypericum perforatum extract demonstrates antioxidant properties against elevated rat brain oxidative status induced by amnestic dose of scopolamine. Pharmacology Biochemistry and Behavior. 2003 Dec 1; 76(3-4):525-33.
8. BLEUSTEIN CB, ESPOSITO MP, SOSLOW RA, FELSEN D, POPPAS DP. Mechanism of healing following the Snodgrass repair. The Journal of urology. 2001 Jan;165(1):277-9.
9. Daher P, Khoury A, Riachy E, Atallah B. Three-week or one-week bladder catheterization for hypospadias repair? A retrospective-prospective observational study of 189 patients. Journal of pediatric surgery. 2015 Jun 1;50(6):1063-6.
10. Leung AK, Robson WL. Hypospadias: an update. Asian journal of andrology. 2007 Jan;9(1):16-22.
11. Stokowski LA. Hypospadias in the neonate. Advances in Neonatal care. 2004 Aug 1;4(4):206-15.
12. Snyder CL, Evangelidis A, Hansen G, Peter SD, Ostlie DJ, Gatti JM, Gittes GK, Sharp RJ, Murphy JP. Management of complications after hypospadias repair. Urology. 2005 Apr 1;65(4):782-5.
13. Cheng EY, Vemulapalli SN, Kropp BP, Pope JC, Furness PD, Kaplan WE, Smith DP. Snodgrass hypospadias repair with vascularized dartos flap: the perfect repair for virgin cases of hypospadias?. The Journal of urology. 2002 Oct;168(4 Part 2):1723-6.
14. Felicien MT, Makon AN, Kamadjou C, Fossi G, Le Coultre C, Andze OG, Sosso MA, Mure PY. Our experience of proximal hypospadias repair using the Cloutier-Bracka technique at the Gynaeco-Obstetric and Paediatric Hospital, Yaounde-Cameroon. African journal of paediatric surgery: AJPS. 2016 Oct; 13(4):193.
15. Arda IS, Mahmutoğlu M. Urethral catheterization in hypospadias surgery: Should the device enter the bladder or be made a urethral stent?. Journal of pediatric surgery. 2001 Dec 1;36(12):1829-31.

Authors Contribution

M.A: Conceptualization of Project

M.S, F.M: Data Collection

G.M.Z, I.H: Literature Search

A.R: Data Analyze

Comparison Between Paracetamol Vs Voltral Suppositories For Post Operative Pain In Gynaecological Procedures

Zeeshan Khan,[1] Saadia Khaleeq,[2] Abaid ur Rehman,[3] Aasam Maan,[4] Umer Farooq,[5] Amjad Nadeem[6]

Abstract

Objective: To compare intravenous paracetamol vs Voltral (Diclofenac) suppositories for post operative pain in gynaecological procedures.

Methods: This was a non randomized controlled trial that was carried out at Department of Anaesthesiology, Sheikh Zayed Hospital, Rahim Yar Khan during 01-07-2019 to 31-12-2019 in which all female cases with age range of 20 to 60 year undergoing any gynaecological surgery requiring general anaesthesia were included. The cases were divided into two equal groups and anesthesia was offered in standard doses. Just before reversal the cases in group A were given intravenous paracetamol in a dose of 1 gm stat and then at 8-hour interval and those in group B were offered diclofenac suppositories in a dose of 50 mg twice a day, 12 hours apart. The pain was assessed at 4,8,12 and 24 hours and was labelled on visual analogue scale (VAS).

Results: In this study there were 62 cases (31 in each group). The mean age in group A and B was 45.41±10.21 vs 48.12±11.13 years with p= 0.47. Mean duration of surgery in both groups was 57.51±15.23 vs53.11±14.79 minutes with p= 0.81. There was no significant difference in mean pain score at 4 and 8 hours with p= 0.91 and 0.81 respectively in group A and B. Mean pain score was 4.43±1.67 vs 3.21±1.09 with p= 0.01 at 12 and 4.57±1.71 vs 3.34±1.27 at 24 hours in group A and B with p values of 0.01 each. Mean time taken for rescue analgesia was 9.13±2.11 in group A and 13.11±1.23 hours in group B with p= 0.001.

Conclusion; Voltral (Diclofenac sodium) suppositories are better than paracetamol infusion in controlling pain after gynecological surgeries and this difference is significantly better at 12 and 24 hours.

Key words: Gynaecological surgery, Pain, Paracetamol, Voltral suppository

How to cite: *Khan Z., Khaleeq S., Rehman Ur A., Maan A., Farooq U. Nadeem A. Comparison Between Paracetamol Vs Voltral Suppositories for Post-Operative Pain in Gynaecological Procedures. Esculapio 2021;17(02):191-194.*

DOI: ***https://doi.org/10.51273/esc21.2517217***

Introduction

Gynaecological surgeries are one of the most commonly performed surgical interventions in collaboration of anaesthesiologist and post-operative pain is one of the major concerns that are addressed by the anaesthetists as part of post anesthesia care unit. It can impact greatly in terms of physiological as well as psychological responses after surgery.[1-2]

Acute pain may last for longer duration of time because of the local tissue damage associated with surgery and associated pathophysiological responses both in central as well as peripheral nervous systems augmenting analgesics with longer duration of action. For this particular reason the data has revealed a diversity from local to systemic analgesia and from simple to multimodal ones, all have been tried in the past with varying degree of success rates and pain still remained a point of concern. Side effect profile of the drugs, route of administration and cost of treatment are the other points of concern in selection of the drug. In resource depleted areas like ours simple and still most commonly practiced agents are diclofenac and acetaminophen. They have been used via various routes ranging from intra venous, intramuscular as well as rectal suppositories and shown promising results.[3-4]

1. Zeeshan Khan
2. Saadia Khaleeq
3. Abaid ur Rehman A
4. Aasam Maan
5. Umer Farooq
6. Amjad Nadeem

1. *Department of Anesthesia, Sheikh Zaid Medical College/ Hospital, Rahik Yar Khan*
2. *Department of Anesthesia*
3. *Department of Anesthesia Lahore Medical College*
4. *Department of Anesthesia Punjab Medical College Faisalabad*
5. *Department of Anesthesia DHQ Hospital, Gujranwala*
6. *Kahota Research Laboratories Islamabad*

Correspondence:
Dr. Zeesha Khan, Department of Anesthesia, Sheikh Zaid Medical College/ Hospital, Rahik Yar Khan.

Submission Date: 07-04-2021
1st Revision Date: 22-04-2021
Acceptance Date: 13-05-2021

Paracetamol is frequently used as non opioid analgesic in postoperative pain and has a morphine-sparing effect. Its mechanism of action is not fully understood, but it is generally accepted that paracetamol is a centrally acting drug.[5-6] Diclofenac is of the most commonly practiced analgesic. It also has the anti-inflammatory properties and exerts its action via inhibition of prostaglandin synthesis by inhibiting cyclooxygenase-1 and cyclooxygenase-2 with relative equipotency. Per rectal administration has shown good efficacies in post operative pain.[7-8]

These two drugs are widely practiced but lacked the data regarding per rectal diclofenac vs intravenous paracetamol, where the formed is very least prescribed in Pakistan. That's why this study was planned to look for better agent to decrease morbidity in such cases with choice of better agent.

Methods

This was a non randomized controlled trial that was carried out at Department of Anaesthesiology, Sheikh Zayed Hospital, Rahim Yar Khan during 01-07-2019 to 31-12-2019. The approval was taken from IRB committee with reference no 209/IRB/SZMC/SZH dated 30-06-2019 and an informed consent was taken from each subject to include in the study. The sample size was calculated by open epi calculator via non probability consecutive sampling as 62 (31 in each group) by keeping the confidence interval as 95%, power equal to 80% and mean pain on VAS as 3.03± 1.02 vs 3.8±1.13 in Paracetamol vs Diclofenac respectively at 24 hours.[14]

In this study, all female cases with age range of 20 to 60 year undergoing any gynaecological surgery requiring general anaesthesia were included. These cases were divided into two equal groups by using lottery method in a ratio of 1:1. Anesthesia was offered to all cases by using injection propofol in a dose of 2 mg per kg, fentanyl in a dose of 3 micrograms per kg, dormicum in a dose of 0.5 mg per kg and injection atracurium in a dose of 0.5 mg per kg. Inhalational anesthesia and reversal was given in standard doses. Vitals were monitored regularly pre anesthesia and at regular intervals during whole surgery. Just before offering the reversal drugs, the cases in group A were given intravenous paracetamol in a dose of 1 gm stat and was continued three times a day at 8-hour interval and those in group B were offered diclofenac suppositories in a dose of 50 mg twice a day, 12 hours apart. The pain was assessed at 4,8,12 and 24 hours and was labelled on visual analogue scale where it was rated as 0 as no pain and 10 as maximum possible pain. In cases of pain, rescue analgesia was given in the form of fentanyl boluses in a dose of 25 micrograms.

Statistical analysis

The data was analyzed by using SPSS version 22.0. The detailed socio demographic and clinical data was collected and mean and standard deviation were assessed by using independent sample t test while frequency and percentages were calculated by using mean Whitney test and Fischer's exact t test for categorical data where the subjects were less than 5 in number. Post stratification p value of ≤ 0.05 was taken as significant.

Results

In this study there were 62 cases (31 in each group). The mean age in group A and B was 45.41±10.21 vs 48.12±11.13 years with p= 0.47. Mean duration of surgery in both groups was 57.51±15.23 vs53.11± 14.79 minutes with p= 0.81 as shown in **table 1**. There were 19 (61.29%) cases from rural population in group A and 22 (70.97%) in group B **(table 2)**. There was no significant difference in mean pain score at 4 and 8 hours with p= 0.91 and 0.81 respectively in group A and B. Mean pain score was 4.43±1.67 vs 3.21±1.09 with p= 0.01 at 12 and 4.57±1.71 vs 3.34±1.27 at 24 hours in group A and B with p values of 0.01 each as in table 03. Mean time taken for rescue analgesia was 9.13±2.11 in group A and 13.11±1.23 hours in group B with p= 0.001 **(table 4)**. Mean rescue analgesia used in group A and B was 65.13±18.67 vs 87.67±25.49 microgram with p= 0.01 as in **table 04**.

Table 1: *Demographic comparison of both groups (n= 31 in each group)*

	Group A	Group B	p
Age (years)	45.41±10.21	48.12±11.13	0.47
Weight (kg)	53.31±18.05	57.13±19.61	0.78
Duration of surgery (mints)	57.51±15.23	53.11±14.79	0.81

Table 2: *Categorical demographics (n= 31 in each group)*

	Group A	Group B	p
Married	28 (90.32%)	27 (87.10%)	0.95
Unmarried	3 (9.68%)	4 (12.90%)	
Rural	19 (61.29%)	22 (70.97%)	
Urban	12 (38.71%)	9 (29.03%)	0.83
Educated	14 (45.16%)	12(38.71%)	
Uneducated	17 (54.84%)	19 (61.29%)	0.88

Table 3: *Comparison of pain in both groups (n= 31 in each group)*

Pain at	Group A	Group B	p
4 hours	3.17±1.01	3.11±1.13	0.91
8 hours	3.19±0.97	3.03±1.04	0.81
12 hours	4.43±1.67	3.21±1.09	0.01
24 hours	4.57±1.71	3.34±1.27	0.01

Table 4: *Comparison of need for rescue analgesia in both groups (n= 31 in each group)*

	Group A	Group B	p
Time for rescue analgesia (hours)	9.13±2.11	13.11±1.23	0.001
Mean dose of rescue analgesia	65.13±18.67	87.67±25.49	0.01

Discussion

Post operative analgesia is one of the salient entities in post operative care units especially in gynaecological surgeries and better for early mobilization to prevent the risk of deep venous thrombosis. A number of drugs as single or in combination and via various administration routes have been practiced. Per rectal diclofenac and intravenous paracetamol has shown good results individually but lacked one to one data comparison.[9-10]

In this study, there was no significant difference in mean pain score at 4 and 8 hours with p= 0.91 and 0.81 respectively in group A and B. Mean pain score was 4.43±1.67 vs 3.21±1.09 with p= 0.01 at 12 and 4.57± 1.71 vs 3.34±1.27 at 24 hours in group A and B with p values of 0.01 each. There was limited but variable data in comparison of both of these drugs.

According to a study done by Abraham A et al they also found diclofenac as better agent and it was seen that mean pain score at the end of day 1 (24 hours) in diclofenac group was 6.21±1.24 as compared to 6.98± 1.07 with paracetamol with p= 0.0001 and they used all the surgeries together along with gynaecological and general surgical procedures. The overall mean pain score in their study was higher than present study but Diclofenac was better agent for pain relief as was seen in our study.[11]

This was also supported by another study done by Taneja et al, where diclofenac was found better than paracetamol in controlling post operative pain in cases of cesarean section with $p < 0.05$.[12] In a study done by Sede et al they compared combination of diclofenac and paracetamol vs paracetamol alone and it was seen that VAS pain score was significantly lower in combination group compared to other groups all time during first 24 hours ($p<0.05$) which was almost similar to resent study.[13] Furthermore, it was found that time for rescue analgesia was 9.13±2.[11] in paracetamol group and 13.11±1.23 in diclofenac groups; further revealing its efficacy with p= 0.001.

However, contradicting results were seen in the study done by Bakhsha F et al where it was seen that in cases undergoing C section, pain was more in Diclofenac supporsotry group as compared to IV paracetamol and was seen as 5.93±1.14 vs 4.53±1.27 at 4 hours, 6.4±1.19 vs 4.43±1.17 at 12 hours and 3.8±1.13 vs 3.03±1.02 at 24 hours respectively.[14]

Conclusion

Voltral (Diclofenac sodium) suppositories are better than paracetamol infusion in controlling pain after gynecological surgeries and this difference is significantly better at 12 and 24 hours.

References

1. Cummings K, Naguib Mohamed A. Stoelting's textbook of pharmacology and physiology in anaesthetic practice: 5th edition; Opioid agonists and antagonists. 2015:217-241.
2. Weingarten TN, Jacob AK, Njathi CM. Multimodal analgesic protocol and postanesthesia respiratory depression during phase i recovery after total joint arthroplasty. Reg Anesth Pain Med 2015;40:330.
3. Apfelbaum JL, Chen C, Mehta SS, Gan TJ. Postoperative pain experience: result from a national survey suggest postoperative pain continues to be undermanaged. Anesth Analg. 2003;97:534–40.
4. Cousins MJ, Power I, Smith G. Pain_a persistent problem. Reg Analg Pain Med. 2000;25:6–21.
5. Hickman SR, Mathieson KM, Bradford LM, et al. Randomized trial of oral versus intravenous acetaminophen for postoperative pain control. Am J Health Syst Pharm 2018;75:367
6. Jibril F, Sharaby S, Mohamed A, Wilby KJ. Intravenous versus Oral Acetaminophen for Pain: Systematic Review of Current Evidence to Support Clinical Decision-Making. Can J Hosp Pharm 2015;68:238.
7. Paul D, Jacob M, Narayan S. Comparative evaluation of efficacy of intravenous paracetamol and intravenous diclofenac as post-operative analgesia in laparoscopic cholecystectomy. Int J Biomed Research. 2015; 6(7): 482-7.
8. Sarika, Wadhwa R. Research article a randomised double blind study comparing preemptive analgesic efficacy of oral acetaminophen, diclofenac and combination of acetaminophen and diclofenac in modified

radical mastectomy surgery. Int J Recent Scientific Res. 2015;6(10):6702-6706

9. Ashima T, Vidhushi M, Kaur T. Comparative study on the effect of paracetamol, diclofenac and their combination in post operative pain relief of cesarean section. JK Science. 2015;17(1):30.
10. Luo J, Min S. Post operative pain management in the postanestheisa care unit: an update. Dovepress. 2017; 10:2687-98.
11. Abraham A, James A, George A, Arun J. A comparative study on analgesi effect of paracetamol and diclofenac in post oerpative care. J Res Pharm Sci. 2017; 8(2): 221-26.
12. Taneja A, Kaur T, Sood. Comparative study on the effect of paracetamol, diclofenac and their combination in pot operative pain relief of caesarean section. JH Sci. 2015;17(1):30-2.
13. Sede SS, Tanha FD, Valadan M. Comparison between Preoperative Rectal Diclofenac Plus Paracetamol and Diclofenac Alone for Postoperative Pain of Hysterectomy. J Family Reprod Health. 2014 Sep; 8(3): 91–95.
14. Bakhsha F, Niaki AS, Jafari SY, Yousefi Z. The Effects of Diclofenac Suppository and Intravenous Acetaminophen and their Combination on the Severity of Postoperative Pain in Patients Undergoing Spinal Anaesthesia During Cesarean Section. J Clin Diagn Res. 2016 Jul; 10(7): UC09–UC12.

Authors Contribution

A.R: Conceptualization of Project

Z.K: Statistical Analysis, Writing of Manuscript

S.R.K: Data Collection

A.M.A.ur.R: Literature Search

U.F, A.N: Drafting, Revision Authors

Correlation of Depression, Anxiety and Stress with Quality of Life in COVID-19 Pandemic

Aysha Rashid,[1] Umair Mudassar,[2] Ismail Tariq,[3] Adil Zaheer,[4] Mariam Iftikhar,[5] Nauman Mazhar[6]

Abstract

Due to Covid-19 pandemic the psychological health of individuals is disturbed globally. There is a dire need of looking into details about the effects of mental health issues on quality of life (QOL).

Objectives: To determine correlation between depression, anxiety, stress, and quality of life among young adults in Covid-19 and evaluate the impact of demographics on quality of life.

Methods: It was a cross-sectional study carried out at a tertiary care hospital. Patients presenting in the psychiatry outdoor of age 18 to 60 years, of both genders and scoring ≥21 on Depression, Anxiety, and Stress Scale (DASS) were enrolled in the study and depression, anxiety and stress severity was assessed and Quality of Life Scale (QOLS) was applied on all to assess their quality of life. All findings were then subjected to statistical analysis.

Results: The mean age of the patients was 21.78±3.204, mean depression score on DASS was 8.58±4.510, mean anxiety score on DASS was 11.68±4.160 and the mean stress score on DASS was 14.84±3.192. There were 63.5% males and 36.5% females. Depression, anxiety and stress had a negative correlation with quality of life. Depression and stress were significantly correlated negatively with quality of life (p=0.000). No demographical factor was significantly associated with poor quality of life.

Conclusion: Depression, anxiety and stress were negatively correlated with poorer QOL and depression and stress had significant association with poor QOL.

Key words: Anxiety, Depression, Covid-19, Quality of life

How to cite: *Rashid A., Mudassar U., Tariq I., Zaheer A., Iftikhar M., Mazhar N. Correlation of Depression, Anxiety and Stress with Quality of Life in COVID-19 Pandemic. Esculapio 2021;17(02):195-199.*

DOI: ***https://doi.org/10.51273/esc21.2517218***

Introduction

During the pandemic of COVID-19, more than 100,000 deaths have been reported in United States till date[1,2]. Besides prevailing fears of having the virus, the level of stress has been raised because of other factors as well, such as confinement and social isolation in order to reduce the spread of virus.[3,4] The adaptation to this whole new lifestyle made people uncertain and confused and it made it difficult for them to maintain their psychological well-being as many individuals had been grieving over losing their loved ones during this pandemic, losing their job and other opportunities professionally and had difficulty as well as delay in achieving the major goals in life.[5,6,7] Evidence from previous literature suggests that world-wide among different populations, the prevalence of depression and anxiety rapidly rose in the initial time of the pandemic,[8] with an estimated prevalence rate of 20% and 35% respectively.[9] Furthermore, fearfulness, worry and stress as well as stigma and fear towards people who are being suspected to have Covid-19 infection have been reported to have negative effect on an individual's life.[10,11] Additionally, because of limited social access and restricted activities, that usually help in maintaining psychological health, psychiatric distress may get exacerbated, thus affecting

1. Aysha Rashid
2. Umair Mudassar
3. Ismail Tariq
4. Adil Zaheer
5. Mariam Iftikhar
6. Nauman Mazhar

1,4. Fatima Jinnah Medical University Lahore
2. Riphah International University, Lahore
3.Continental Medical College Lahore
5. Sir Ganga Ram Hospital, Lahore

Correspondence:
Aysha Rashid, Associate Professor and HOD Fatima Jinnah Medical University Lahore. Email: ashi.32c@gmail.com

Submission Date: 30-03-2021
1st Revision Date: 07-04-2021
Acceptance Date: 18-05-2021

functioning and quality of life of people[12,13]. In as study by Salman M, (2020) on university students of Lahore, it was found that during Covid-19 pandemic moderate to severe anxiety and depression was found in 34% and 45% participants respectively. Similar study revealed that the major cause of psychological distress among the participants was the negative affect of ongoing pandemic on their daily life ($p<0.001$).[14] In another study, Amin F (2020) revealed that 43% of the Pakistani frontline physicians suffered from anxiety/ depression during this pandemic.[15] Ashraf F (2021) revealed that during Covid-19 pandemic in Pakistan, psychological distress was less common in people who had high level of satisfaction with life and had a meaning in life ($z = -3.507$, $p < 0.0001$ and $z = -2.632$, $p < 0.001$, respectively)16. In a study, it was revealed that patients who were diagnosed to have mental health problems during Covid-19 were more prone to have impaired quality of life i.e. in terms of physical and mental functioning and this association was found to be significant ($P<0.001$).[17] In another study by Zhang Y, (2020) assessed the effect of Covid-19 on mental health and quality of life of patients and it was found that 52.1% participants had mental health related issue and 7.6% had negative impact on the quality of life of the patients and the association between these two was significant ($p<0.05$).[18]

Majority of the international and local researches conducted so far focused on adverse outcome related to this pandemic and shifted their attention towards evaluating more positive and preventive outcomes of this pandemic, such as quality of life. However, there is still a need of conducting further local research for confirmation of the psychological factors as well as demographical factors that can affect quality of life of patients during this pandemic in order to confirm the reliability of the aforementioned results. In light of this, the current study aimed to determine the relation between depression, anxiety, stress and quality of life of individuals in Pakistan during this COVID-19 pandemic and determine the effect of demographical profile on quality of life of individuals. This study will provide guidance about emerging psychological issues and their effect on quality of life of individuals, which if addressed earlier and properly can help in reducing morbidity associated with the condition and can improve the overall quality of life of people.

The aim of the study

The study aimed to examine the correlation between depression, anxiety, stress, and quality of life among young adults during the COVID-19 pandemic and the association of demographical factors with quality of life.

Methods

It was a cross-sectional study. After taking approval from the ethical review committee, a total of 274 patients of both genders, aged 18 to 60 years who presented to the outdoor of Psychiatry Department in a tertiary care hospital were enrolled if they fulfilled the inclusion criteria i.e. on Depression, Anxiety and Stress scale their overall score was 21 and the symptoms specifically started during the Covid-19 pandemic in Pakistan i.e. from March, 2020 onwards. They were ensured that their data will be kept confidential and that data is only used for current research. Participants had the right without penalty to leave this study. Written informed consent was taken from all the patients. Patients with other mental health related issues such as schizophrenia, obsessive-compulsive disorder, drug abuse or organicity were excluded from the study.

Demographical detail, clinical history and details according to DASS scale were enquired from all patients and findings were noted down on a predesigned performa. All patients were then given Quality of Life Scale (QOLS) for assessing quality of life.[2] In QOLS, the seven responses were (7=delighted), (6=pleased), (5= mostly satisfied), (4=mixed), (3=mostly dissatisfied), (2=unhappy), (1=terrible). The QOLS scores ranged from 16 to 112. The QOLS scores were summed and higher score indicated a higher quality of life with a cut off of 80 representing good quality of life.[2]

DASS scale has 7 domains each divided into subscales to assess depression, anxiety and stress[2]. Using DASS, the severity of depression was categorized as no depression (0-9), mild (score 10-12), moderate (13-20), severe (21-27) and extremely severe (>28 score). The severity of anxiety was categorized as no anxiety (0-6), mild (score 7-9), moderate (10-14), severe (15-19) and extremely severe (>20 score). The severity of stress was categorized as no stress (0-10), mild stress (score 11-18), moderate stress (19-26), severe stress (27-34) and extremely severe stress (>34 score). All findings were noted down on a predesigned performa and was subjected to statistical analysis.[2]

Data was analyzed using SPSS version 24.00. Quantitative variables such age, DASS score for depression,

Table 1: *Showing Mean of Quantitative Variables*

Quantitative Variables	N=274 Mean ±Standard Deviation
Ag	45.72±19.2
DASS Score:	
Depression	8.58±4.510
Anxiety	11.68±4.160
Stress	14.84±3.192
Quality of life Scale Score	75.08±21.049

Table 2: *Showing Frequency Distribution of Qualitative Variables*

Qualitative Variables	N=274 Frequency (Percentage)
Age groups:	
Young age (18 to 30 years)	53 (19.3%)
Early middle age (31 to 45 years)	148 (54%)
Late middle age (46 to 60 years)	73 (26.6%)
Gender:	
Male	174 (63.5%)
Female	100 (36.5%)
Family system:	
Nuclear	163 (59.5%)
Joint	111 (40.5%)
Place of living	
Urban	168 (61.3%)
Rural	106 (38.7%)
Depression:	
Mild depression	50 (18.3%)
Moderate depression	116 (42.3%)
Severe depression	53 (19.3%)
Extremely severe depression	55 (20.1%)
Anxiety:	
Mild anxiety	23 (8.4%)
Moderate anxiety	92 (33.6%)
Severe anxiety	70 (25.5%)
Extremely severe anxiety	89 (32.5%)
Stress:	
Mild stress	22 (8%)
Moderate stress	11 (4%)
Severe stress	47 (17.2%)
Extremely severe stress	194 (70.8%)
Quality of Life:	
Poor	144 (52.6%)
Good	130 (47.4%)

anxiety and stress and QOLS score was presented as mean and standard deviation. Qualitative data such as gender, family system, place of living, profession, severity of depression, severity anxiety, severity of stress and quality of life were presented as frequency and percentage. Data was stratified for age, gender, family system and place of living. Post-stratification chi square test was applied and a p value of 0.05 was considered significant. The relationship between depression, anxiety, stress, and quality of life among young adults during the COVID-19 pandemic was determined by Pearson correlation test and a p value of 0.05 was considered significant.

Results

The mean age of the patients was 21.78±3.204, mean depression score on DASS was 8.58±4.510, mean anxiety score on DASS was 11.68±4.160 and the mean stress score on DASS was14.84±3.192 **(Table 1)**. The mean QOLS score was 75.08±21.049 **(Table 1)**. Frequency distribution of qualitative variables is presented in **table 2**. Association between quality of life and

Table 3: *Showing Association Of Demographical Factors And Depression, Anxiety And Stress With Quality Of Life*

Variables		Quality of Life		Test Value	Significance (p value)
		Poor	Good		
Age Groups	Young Age	30 (10.9%)	23 (8.4%)	4.856	0088
	Middle Age	69 (25.2%)	79 (28.8%)		
	Old Age	45 (16.4%)	28 (10.2%)		
Gender	Male	95 (34.7%)	79 (28.8%)	0.798	0.372
	Female	49 (17.9%)	51 (18.6%)		
Family Type	Nuclear	86 (31.4%)	77 (28.1%)	0.007	0.934
	Joint	58 (21.2%)	53 (19.3%)		
Place of living	Urban	90 (32.8%)	78 (28.5%)	0.18	0.671
	Rural	54 (19.7%)	52 (19%)		
Depression	Mild	50 (18.2%)	0 (0%)	-0.659	0.000*
	Moderate	74 (27%)	35 (12.8%)		
	Severe	12 (4.4%)	21 (7.7%)		
	Extremely severe	8 (2.9%)	74 (27%)		
Anxiety	Mild	0 (0%)	23 (8.4%)	-0.095	0.117
	Moderate	53 (19.3%)	39 (14.2%)		
	Severe	51 (18.6%)	19 (6.9%)		
	Extremely severe	40 (14.6%)	49 (17.9%)		
Stress	Mild	5 (1.8%)	17 (6.2%)	-0.292	0.000*
	Moderate	3 (1.1%)	8 (2.9%)		
	Severe	14 (5.1%)	33 (12%)		
	Extremely severe	122 (44.5%)	72 (26.3%)		

*p value ≤0.05 was considered significant

demographical factors, depression, anxiety and stress are presented in **table 3**.

Discussion

The current study revealed that depression, anxiety and stress were negatively correlated with quality of life i.e. presence of these mental health issues were associated with a poor quality of life. However, only correlation of depression and stress with quality of life was found to be statistically significant. Demographical factors such as age, gender, family type and place of residence were not found to be significantly associated with poorer quality of life.

Globally, concerns have been expressed deeply by the researchers about a high prevalence of issues related to mental health in both general and vulnerable population.[14,15] It is necessary to determine these problems in order to plan things accordingly.[16,17] The current research was in accordance with the call of the researchers to provide an overview of prevailing mental health issues in COVID-19 pandemic in Pakistan and to see the impact on quality of life of people. It is difficult to make comparison of findings of this research with the previous ones carried out during non-pandemic era owing to the fact that the difficulties faced by individuals during COVID-19 are inconsistent in comparison to the non-pandemic times. The study revealed that depression and stress had significant correlation with poorer quality of life. Thus, higher scores of depression and stress were associated with low scores on quality of life scale thus denoting that these mental health issues lead to poor quality of life in participants during COVID-19 pandemic. In a study by Zhang et al. in 2020, it was found that mental issues related to Covid-19 had only mild impact on the quality of life of individuals and only 7.6% had poorer quality of life as assessed by Impact of event scale (IES), however, this association was found to be significant ($p< 0.005$).[18] Our study revealed a higher percentage of poorer quality of life in individuals who had mental health issues i.e. 52.6%. In another study Algahtani et al. showed that patients with depression (OR=5.70), anxiety (OR=5.47) and stress (OR=6.57) had scored on the lower side of the QOL scale and thus were associated with poorer quality of life. An important component of overall QOL is psychological dimension. Study by Algahtani et al. validated the relationship between quality of life and psychological health of patients[2]. Similar findings were reported by another study conducted in Saudia Arabia, which revealed that individuals who were highly distressed reported to have poor health related quality of life.[23] These findings were in line with the findings of current study which too revealed that poor quality of life was associated with depression and stress, however, anxiety was not significantly linked up.

The situation of COVID-19 has not changed much and still uncertainty exists about its effects and outcomes.[18,19] Looking at the results of current research, mental health issues specially related to depression and stress must be addressed properly, as these mental health issues can have serious consequences and thus necessitates that measures should be taken adequately and promptly to reduce mental health issues and improve quality of life of individuals during this pandemic.

The study had certain limitations. Firstly, it was carried out at a single center and the sample size was small, so the results cannot be generalized. Secondly, the effect of providing treatment to the patients presenting with depression, anxiety and stress was not assessed in terms of improvement in quality of life. Thirdly, besides pandemic and demographical details, other factors leading to depression, anxiety, stress and poorer quality of life were not assessed.

Conclusion

COVID-19 pandemic is associated with significant mental health issues such as depression and stress that lead to poor quality of life. Adequate attention should be given to these mental health issues to ensure proper functioning and quality of life of individuals by screening individuals earlier and provision of prompt psychological services to those in need.

Conflict of Interest: None

References

1. Shamblaw AL, Rumas RL, Best MW. Coping during the COVID-19 pandemic: Relations with mental health and quality of life. Canadian Psychology. 2021 Jan;62(1):92–100.
2. Algahtani FD, Hassan SU, Alsaif B, Zrieq R. Assessment of the quality of life during COVID-19 pandemic: A cross-sectional survey from the kingdom of Saudi Arabia. International Journal of Environmental Research and Public Health. 2021 Jan;18(3):847.
3. Zhang HH, Zhao YJ, Wang C, Zhang Q, Yu HY, Cheung T, et al. Depression and its relationship with quality of life in frontline psychiatric clinicians during the COVID-19 pandemic in China: a national survey. International

Journal of Biological Sciences. 2021;17(3):683.
4. Daneshfar Z, Sadatmahalleh SJ, Youseflu S, Khomami MB, Kazemnejad A. Influential factors on quality of life in married Iranian women during the COVID-19 pandemic in 2020: a path analysis. BMC women's health. 2021 Dec;21(1):1-8.
5. Ravens-Sieberer U, Kaman A, Erhart M, Devine J, Schlack R, Otto C. Impact of the COVID-19 pandemic on quality of life and mental health in children and adolescents in Germany. European Child & Adolescent Psychiatry. 2021 Jan;25:1-1.
6. Leibovitz T, Shamblaw AL, Rumas R, Best MW. COVID-19 conspiracy beliefs: Relations with anxiety, quality of life, and schemas. Personality and Individual Differences. 2021 Jun 1;175:110704.
7. Wang C, Pan R, Wan X, Tan Y, Xu L, McIntyre RS, et al. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. Brain, behavior, and immunity. 2020 Jul 1;87:40-8.
8. Korkmaz S, Kazgan A, Çekiç S, Tartar AS, Balcı HN, Atmaca M. The anxiety levels, quality of sleep and life and problem-solving skills in healthcare workers employed in COVID-19 services. Journal of Clinical Neuroscience. 2020 Oct 1;80:131-6.
9. Lakhan R, Agrawal A, Sharma M. Prevalence of Depression, Anxiety, and Stress during COVID-19 Pandemic. Journal of Neurosciences in Rural Practice. 2020 Oct; 11(4):519.
10. Epifanio MS, Andrei F, Mancini G, Agostini F, Piombo MA, Spicuzza V, et al. The impact of COVID-19 pandemic and lockdown measures on quality of life among Italian general population. Journal of Clinical Medicine. 2021 Jan;10(2):289.
11. Abdullah MF, Yusof HA, Shariff NM, Hami R, Nisman NF, Law KS. Depression and anxiety in the Malaysian urban population and their association with demographic characteristics, quality of life, and the emergence of the COVID-19 pandemic. Current Psychology. 2021 Feb 19:1-2.
12. Levkovich I, Shinan-Altman S, Essar Schvartz N, Alperin M. Depression and Health-Related Quality of Life Among Elderly Patients during the COVID-19 Pandemic in Israel: A Cross-sectional Study. Journal of Primary Care & Community Health. 2021 Feb; 12: 2150132721995448.
13. Lipskaya-Velikovsky L. COVID-19 Isolation in Healthy Population in Israel: Challenges in Daily Life, Mental Health, Resilience, and Quality of Life. International Journal of Environmental Research and Public Health. 2021 Jan;18(3):999.
14. Salman, M., Asif, N., Mustafa, Z.U., Khan, T.M., Shehzadi, N. and Hussain, K., Psychological Impact of COVID-19 on Pakistani University Students and How They are Coping. Medrxiv. 2020: 1-16.
15. Amin F, Sharif S, Saeed R, Durrani N, Jilani D. COVID-19 pandemic-knowledge, perception, anxiety and depression among frontline doctors of Pakistan. BMC psychiatry. 2020 Dec;20(1):1-9.
16. Ashraf F, Zareen G, Nusrat A, Arif A, Griffiths MD. Correlates of Psychological Distress Among Pakistani Adults During the COVID-19 Outbreak: Parallel and Serial Mediation Analyses. Frontiers in Psychology. 2021 Mar 31;12:825.
17. Liu CH, Stevens C, Conrad RC, Hahm HC. Evidence for elevated psychiatric distress, poor sleep, and quality of life concerns during the COVID-19 pandemic among US young adults with suspected and reported psychiatric diagnoses. Psychiatry research. 2020 Oct 1;292: 113345.
18. Zhang Y, Ma ZF. Impact of the COVID-19 pandemic on mental health and quality of life among local residents in Liaoning Province, China: A cross-sectional study. International journal of environmental research and public health. 2020 Jan;17(7):2381.
19. Ma YF, Li W, Deng HB, Wang L, Wang Y, Wang PH, et al. Prevalence of depression and its association with quality of life in clinically stable patients with COVID-19. Journal of affective disorders. 2020 Oct 1;275: 145-8.
20. Zahra D, Sadatmahalleh SJ, Samaneh Y, Mahnaz BK, Anoshiravan K. Influential Factors on quality of life in married Iranian women during the Covid-19 pandemic in 2020: A Path Analysis.
21. Cam HH, Top FU, Ayyildiz TK. Impact of the COVID-19 pandemic on mental health and health-related quality of life among university students in Turkey. Current Psychology. 2021 Mar 31:1-0.
22. Korkmaz S, Kazgan A, Çekiç S, Tartar AS, Balcı HN, Atmaca M. The anxiety levels, quality of sleep and life and problem-solving skills in healthcare workers employed in COVID-19 services. Journal of Clinical Neuroscience. 2020 Oct 1;80:131-6.
23. Hawash MM, Alhazmi AH, Wafik W, Muzammil K, Mushfiq S, Ahmed HA. The Association of COVID-19 Pandemic Stress With Health-Related Quality of Life in the Kingdom of Saudi Arabia: A Cross-Sectional Analytical Study. Frontiers in Public Health. 2021;9.

Authors Contribution

A.R: Conceptualization of Project

U.M: Statistical Analysis

I.T: Writing of Manuscript

A.Z: Data Collection

M.I: Literature Search

N.M: Drafting, RevisionAuthors

Review Article

Role of Ultrasound Guided Percutaneous Nephrostomy in Obstructive Uropathy Patients: A systematic Literature Review

Abeer Zafar,[1] Muhammad Nawaz Anjum,[2] Nabeel Shafi,[3] Mehreen Fatima[4]

Abstract

Objectives: 1. To conduct a systemic review on USG guided PCN in obstructive uropathy and review its efficacy and complication rate. 2. To conduct a systemic review of USG guided PCN and establish qol in patients with obstructive uropathy. 3. To conduct a systemic review of USG guided PCN and examine its success rate.

Methods: The materials and methods comprised of an extensive internet based article hunting with keywords of "Ultrasound(USG) guided PCN", "Obstructive uropathy", "Deranged renal function tests" and "Quality of life". The main medical websites/databases which were implored for this systemic review included PubMed, Cochrane review database, Research gate, Emedicine, EBSCO's, medScape, Science Direct, Google, PMC articles and multitude of scientific publications in international journals from 1945 to March 2020. A total of 146 articles were selected, out of them, 9 articles fulfilled final scrutiny and were reviewed for this study. All studies involving blockade of ureters by any pathology, benign or otherwise, were included. USG was primary interventional tool in all studies.

Results: Nine articles fulfilled all the pre-requisites for systemic analysis. The total data consisted of 630 people, having a mean age of 56 years (Variance: 3 – 70). Percutaneous nephrostomy catheter was placed to relieve blockade in both benign and malignant conditions. In 506 patients, one side was operated, while in 104 both sides were successfully attempted. There was attempted failure in placement of nephrostomy in remaining 20 cases. Out of 630, post-operative renal function improvement was shown in 575 patients, 55 patients showed no improvement. Overall a very negligible percentage of complications were reported in all studies (1–3%). The average stay in health care establishments was 14 days varying from 7 to 21 days.

Conclusions: PCN is a safe and effective urinary diversion. It gives prompt relief to obstructive uropathy in critically ill patients. PCN is useful therapeutic procedure for benign and malignant ureteric obstruction while helping in preserving renal function, with a low complication rate. Ultrasound guided PCN is safe in Obstructive uropathy patients. Due to no need of general anesthesia, a very negligible failure rate < 2 % and very low complication rate of 1-3%, ultrasound guided nephrostomy tube placement is safe and highly effective in emergency decompression of kidneys.

Keywords: "Percutaneous Catheter", "Ultrasound guided Nephrostomy", " Ureteric Obstruction", "Renal Function Improvement", "Complications of Nephrostomy".

How to cite: *Zafar A., Anjum M.N., Shafi N., Fatima M. Role of Ultrasound Guided Percutaneous Nephrostomy in Obstructive Uropathy Patients: A systematic literature review. Esculapio 2021;17(02):200-206.*

DOI: ***https://doi.org/10.51273/esc21.2517219***

Introduction

Obstructive uropathy is an alarming issue with an occurrence of 14.7% in all of urological acute presentations.[1] This condition occurs due to any impediment in urine drainage, extrinsic or intrinsic, leading to an outflow obstruction. This causes stretch of renal capsule, dull aching pain, stasis of urine, promoting urinary tract infections and ultimately uro-sepsis with deranged renal functions.[2] Being an acute emergency with life at bay, aggressive interventional therapies are needed to relieve blockade of kidneys.[3] This blockade can occur from either benign or malignant diseases.[4] Renal calculi are the main Culprits leading to obstruction in Age of 20-45 years. Iatrogenic gynecological injuries to ureters and malignancy in old people is also

1. Abeer Zafar
2. Muhammad Nawaz Anjum
3. Nabeel Shafi
4. Mehreen Fatima

1,2. University of Lahore
3,4. Services Institute of Medical Sciences, Lahore

Correspondence:
Dr. Abeer Zafar, University of Lahore

Submission Date: 18-03-2021
1st Revision Date: 28-03-2021
Acceptance Date: 22-04-2021

a common cause of obstruction.[5] Treatments for relieving urinary tract blockade comprise of various forms of external and internal draining tubes in form of nephrostomy Catheters, double J stents. If nothing works, open or endoscopic urological surgeries are required to relieve the obstruction. Goodwin in 1955 changed the landscape of intervention in obstructive uropathy, while trying to access abdominal aorta. He accidentally punctured a dilated collecting system, thus starting a new chapter in minimal radiological interventions.[6]

The management of obstructive uropathy has received a much wanted boost with the advent of minimal invasive surgery and advancement in better imaging modalities techniques as fluoroscopy and ultra-sonography (USG).[7] Double J stents and PCN have made the open nephrostomy a relic of past. Placement of external draining nephrostomy tube is a gold standard therapy in patients with blockade of urinary outflow due to benign or malignant causes causing deranged renal function profile, in patients with iatrogenic ureterovesical fistulas, pyonephrotic kidneys and for antegrade studies.[9,10] Access to renal collecting system is sought out with guidance of an Image intensifier as a solo act, or in partnership with an ultrasound.[10]

Although research on newer novel devices is ongoing[11] and treatment options keep improving, USG guided PCN has stood test of time and effectiveness in patients of obstructive uropathy.[12] Ultrasound has many advantages and benefits over image intensifier in setting of PCN. Ultrasound is cheap and cost effective, has no potential radiation risk, easily available all over the developing world and is not dependent on contrast administration.[13] Image intensifier needs a dedicated image operator, continuous radiation hazard, logistics in form of lead sheaths, gowns and thyroid covers. It also requires a reliable high output electricity source and contrast administration either anterograde or retrograde to visualize collecting system of kidney.[14] USG can be portable as well while image intensifiers are usually large, bulky and fixed. This cumbersomeness hinders their use in time bound procedures.

Like any interventional surgery, placing a nephrostomy catheter also can lead to un wanted outcomes in form of bleeding, peritonitis, urine collection in abdomen, migration of tube, improper placement, uro-sepsis and hematuria.[15]

The aim of this study was to conduct a systemic review of literature, looking impact of USG guided nephrostomy tube placements in cases of both benign and malignant pathologies. We thoroughly investigated nine articles and looked at common variables like the impact on patient's general health, mean time of decreased serum creatinine levels, mean time of decrease in blood urea levels, mean hospital stay and complications after PCN insertion.

Methods

In order to carry out an organized and systemic review, basic guidance was sorted out from re-known research and analysis databases as Cochrane library and PRISMA guidelines[16]. The search engines which were implored for this systemic review included PubMed, Cochrane review database, Research gate, Emedicine, EBSCO's, medScape, Science Direct, Google, PMC articles . A multitude of scientific publications in international journals from 1945 to March 2020 were implored, majority of which were written in English language and were open to access. There was no copyright issues and full credit was given to original article. The keywords included; "Percutaneous Catheter", "Ultrasound guided Nephrostomy", "Ureteric Obstruction", "Renal Function Improvement", "Complications of Nephrostomy". Research was also conducted on yahoo search engine with linking of all keywords as solo presentation and in combination form.

By imploring these action words, a total of 146 arcticles were selected. Out of 146 articles, 32 lacked intent in title while 114 showed good data points to be considered moving forward. Out of 114 promising articles, further 102 were eliminated on lacking pertinent points which were intended outcomes. This left us with 12 articles which were probed further for evaluation. A further 3 articles were excluded after screening of full manuscript, leaving to 9 articles which were included for systematic reviewing.

All studies involving Blockade of urinary outflow due to any benign or malignant cause were included. USG was primary interventional tool in all studies. Studies mentioning impact of nephrostomy drainage in benign and malignant conditions were included, but studies that included diagnostic or elective surgery, were excluded.

Search strategy

This was mainly streamlined for considering and rejecting articles for this systemic review.

Articles to be deemed worthy

- All Studies mentioning data pertaining cases of

obstructive uropathy in which USG guided nephrostomy catheter was placed as an emergency procedure.

- All interventional studies that were done for relieve of urinary blockade via nephrostomy from 1945 to March 2020.

Exclusion criteria

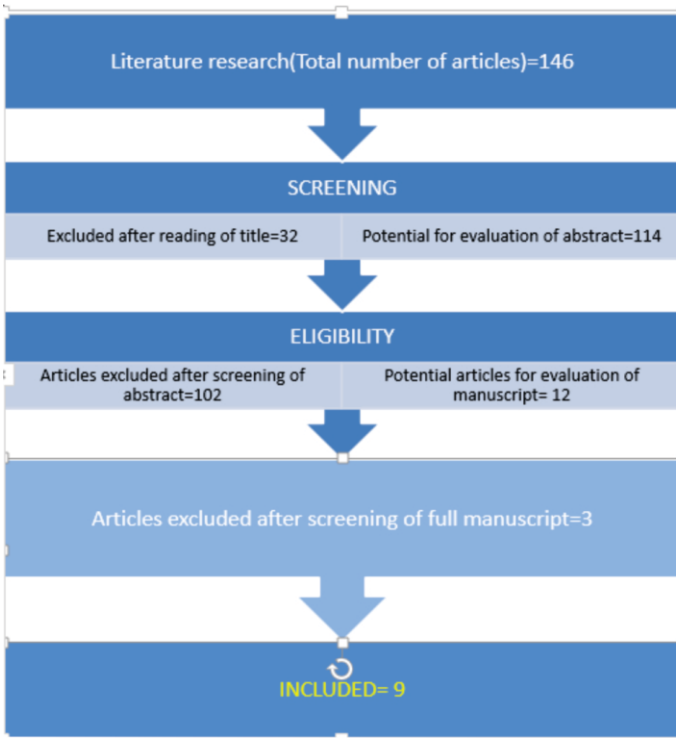
- Placing a nephrostomy catheter for diagnostic procedures e.g whittaker test
- PCN in elective surgeries as Percutaneous Nephrolithotomy (P.C.N.L).

Table 1. *PRISMA Flow chart of the included studies*

Results

Breakdown of literature Hunt

A thorough scrutiny was done, involving 146 articles,



filtering out those which lacked outcomes intended or deficiency in data reporting. This comprehensive process lead to a final showdown of nine articles, comparing common variables and data of 630 patients in total **(Table 1)**. The complete breakdown of characteristics of nine studies revealed year of publication, nature of study, time taken for study to be published and mean hospital stay(all documented in **Table 2**).

Demographics and renal Functions

A mean age of 56 years was observed with variance of ± 14 years in all studies which included patients with benign and malignant causes of ureteric obstruction respectively. In 506 patients, one side was operated, while in 104 both sides were successfully attempted. There was attempted failure in placement of nephrostomy in remaining 20 cases. There was marked improvement in kidney functions across all studies, after relieve of blockade. In all benign conditions, 5 studies out of 9, nearly 90% showed return of renal functions to baseline value. Unilateral PCN (n=506) v/s Bilateral PCN(n=104) showed no statistical difference in creatinine improvement in all studies.

Primary outcomes

Hospital stay time after percutaneous nephrostomy

In our systemic review, we found out that five studies[17,18,19,21,24] which were done in predominantly non-malignant ureteric obstruction, relieved by Ultrasound guided Percutaneous Nephrostomy(PCN) showed a mean hospital stay of 9 days. In remaining four studies[20,22,23,25] which were predominantly done for ureteric obstruction due to malignancy, mean hospital stay was 21 days. This showed a significant prolonged stay in patients in which PCN was done for obstruction due to malignancy.

Improvement in renal functions

There was marked improvement in renal function tests across all studies, after relieve of blockade. In all benign conditions, i.e. 5 studies out of 9, nearly 90% showed return of renal functions, both creatinine and urea, close to baseline levels in 7 days post PCN. In malignant conditions, out of 4 studies, drop in renal parameters took longer upto 21 days in one study and only 60% of cases reached a baseline level (cr =1.0 ng/L) which was regarded as normal. Unilateral PCN(n=506) vs Bilateral PCN(n=104) showed no statistical difference in creatinine improvement in all studies.

Nephrostomy insertion leading to complications

Like any interventional surgery, placing a nephrostomy catheter also can lead to unnecessary outcomes in form of bleeding, peritonitis, urine collection in abdomen, migration of tube, improper placement, uro-sepsis and hematuria Table 3.[18,19,21,22,23,24,25] Muhammad Naeem reported a rate of 2-4 %, which was the same in single or multiple nephrostomy insertions and mostly were hemorrhage (4%), infection or sepsis(2%) and tube displacement (4%). Three studies[14,17,20] reported no complications post-nephrostomy tube placement. Only 2 studies illustrated data of re-admission due to a complication[20,25] and nearly 20 % cases with malig-

Table 2: *Complete breakdown of the study characteristics*

Author	Year published	Journal	Nature of study	Study Period	Mean Age (Years)	Number of patients	Mean Hospital stay(Days)
Liaqat Ali, Saifullah Khan, Faiza Hayat, Nasir Orakzai	January-March 2020	*Ann Pak Inst Med Sci. 2020; 16(1): 10-14.*	Randomized Control Trial	From March 2018 till March 2019.	35.6 ± 8.4	208	6
Muhammad Naeem, Mir Alam Jan, Anayat Ullah	2010	JPMI	Retrospective	January 2006 to December 2008	41.6 ± 12.68	200	10
Iftikhar Ahmed, Imtiaz Hussain Rizvi, Mohammad Nadeem Ahmed	1995	JPMA 45:16	Retrospective	Jan 1990-Jan 1992	41	34	7
JR Wilson, GH Urwin, MJ Stower	2005	*Ann R Coll Surg Engl*	Retrospective	1 December 1996 to 31 December 2001- 5 years	68.1 ± 16	33	29
Subrata Kumar Das, Anshuman Panda, Tapas Ranjan Gupta	2017	International Surgery Journal, Vol 4, No 1	Retrospective	Jan 2016- july 2016	55.6 ± 8.3	35	7
Matthys Cornelis van Aardta*, Judith vanAardta and Arnold Moutona	2017	Southern African Journal of Gynaecological Oncology	Retrospective	1 January 2007 until 31 December 2012- 5 years	49.5±10.1	54	18
Gaurav Garg, Nupur Bansal, Manmeet Singh	2019	IJPC	Retrospective	January 2015 to December 2016	51 ± 14	33	14
Albert C. Li, M.D ,Sidney P. Regalado, M.D.	2012	Semin Intervent Radiol;29:218–225	Retrospective	March 2011	66	1	14
G. Sood, A. Sood, A. Jindal	2006	International Braz J Urol Vol. 32 (3): 281-286,	Prospective	May - June,2015	41.4±21.4	32	21
TOTAL					56(42-70)	630	14

nancy and pcn in situ were re-admitted in hospital again. JR Wilson and colleagues dwelled into realm of patients staying in healthcare facilities after placement of nephrostomy catheter. Their data showed people with nephrostomy tube in situ, spent total mean of 29 days (range, 1–82 days) in observation from insertion of tube until death/closure of the study duration (33.3%). There was 1.6 times chance of re-admission for every indivisual until he or she died. In total 26 cases which were re-admitted, 14 needed a nephrostomy replacement due to overuse of first tube , while 12 were admitted for reconsideration due to faulty nephrostomy catheter.

Bilateral versus unilateral percutaneous nephrostomy

Out of total 630 in all nine studies, patients who underwent unilateral PCN were 506 and patients who underwent bilateral PCN were 104, with failure to perform PCN in 20 patients. In only one study 20, 32 patients who had PCN were converted to Double J internal drainage tubes. More than 90 % stayed with long term nephrostomy tube in situ.

QOL after percutaneous nephrostomy

In only one study in which PCN was done for malignant ureteric obstruction,[20] Quality of life was documented after doing PCN. They followed steps laid down by McPhee[26] and these criteria were applied to their 32 cases. More than 50 % failed to fulfill this criteria, 40 % died in health care establishment and only 7 % were alive when data was compiled. In all remaining eight studies, Q.O.L was not mentioned or regarded variable.

Discussion

What our review showed

Table 3: *Complications of Nephrostomy Insertions*

Study	Infection/ Sepsis	Malposition/occlusion/ dislodgment	Hemorrhage	Death	Hematuria	Total Patients
Liaqat Ali, Saifullah Khan, Faiza Hayat, Nasir Orakzai	-	-	-	-	-	208
Muhammad Naeem, Mir Alam Jan, Anayat Ullah	4/200	4/200	8/200			200
Iftikhar Ahmed, Imtiaz Hussain Rizvi, Mohammad Nadeem Ahmed		2/34				34
JR Wilson, GH Urwin, MJ Stower	-	-	-	-	-	33
Subrata Kumar Das, Anshuman Panda, Tapas Ranjan Gupta	-	-	-	-	-	35
Matthys Cornelis van Aardta*, Judith van Aardta and Arnold Moutona	-	-	-	-	-	54
Gaurav Garg, Nupur Bansal, Manmeet Singh	4/33	2/33	4/33		3/33	33
Albert C. Li, M.D ,Sidney P. Regalado, M.D.	-	-	-	-	-	1
G. Sood, A. Sood, A. Jindal		3/32			4/32	32

Nearly 98 % success rate was reported in all studies while placing an ultrasound guided PCN. The mean time taken by renal functions to return to normal baseline levels was 4-28 days post nephrostomy tube placement, especially longer in studies where malignancy was cause of obstruction. 55 patients out of 630 showed no improvement and were later labeled as ESRD patients.

A very negligible adverse outcome rate was seen in all nine studies(1–3%), healthcare stay in hospital post nephrostomy tube placement varied from 6-21 days (mean = 14 days)in all nine studies, being more in three malignant studies 16-29(20 days).

The data regarding this burden on patients and healthcare establishment is lacking[27] but advanced cancer and co-morbidities could be a compounding factor as well.

This systemic review showed that ultrasound guided percutaneous nephrostomy placement is safe, reliable, lifesaving and efficacious in relieving obstructive uropathy. The overall success rate of 98% signifies that this procedure can be done with high accuracy and benefit of being not dependent on general anesthesia, adds to great value of this tool. Usually patients of obstructive uropathy are not stable, unfit for surgery and general or regional anesthesia. This minimal invasive method thus not buys time but is lifesaving in these cases.

Open and endo-urological surgery has its own merits and demerits. The negligible complication rate of usg guided PCN makes it a gold standard and first choice procedure where patient is not fit for surgery.

The significance of usg guided PCN cannot be ruled out in patients with malignancies. In these scenarios, sometime due to advanced nature of disease, only intervention that could be done is placement of a nephrostomy tube. Ultrasound guided PCN becomes a lifesaver in these cases and due to minimal access, morbidity and quality of life are not exacerbated in critical patients.

Limitations of the study

Among all nine studies, majority were descriptive-retrospective (7 studies), one was randomized control trial and one was prospective study.

Like any interventional study, especially when operative area contains large blood vessels as aorta, inferior vena cava, renal artery and segmental arteries, hemorrhage is an easily foreseen unwanted complication which requires thorough counseling before proceeding for nephrostomy tube placement.

Only cases with malignancy were kept in follow up and majority of studies of benign cause showed no follow up after 7 days (in 6 out of 9 studies). Patients were not stratified according to degree of renal failure prior to PCN and only were labeled ESRD (n=55) patients after PCN had already been done, showing significant high number of unfruitful intervention.

This compels us to recommend a randomized control trial in which patients are pre stratified by renal scans

before undergoing any intervention. Moreover, we also recommend quality of life assessment in all studies with usg guided PCN so that fruitfulness of this intervention could be sort out and risk-benefit ratio can be calculated.

Future is promising

Big population sample[29] with evolving field of science, newer inventions which make renal access efficiently through more accurate and refined tools, push researchers into newer realms of endless possibilities.[30,31,32,33,34,35,36,37] Due to revolution in field of imaging modalities and evolution in how doctors of future are being trained, we are entering an era where miniaturization and nano science will take each intervention with a storm. On top of this , the need of hour is to develop a QOL tool[38] for guiding our doctors on when to intervene in case of urinary obstruction, not making or compounding more misery on patient lives, making an educated, well informed, 2 way communicated decision to go for PCN[39] in justified group of patients.

Conclusions

Relieving upper tract urinary blockade by USG guided PCN is a viable and safe option in patients with obstructive uropathy. This systemic review showed that ultrasound guided percutaneous nephrostomy placement is safe, reliable, lifesaving and efficacious in relieving obstructive uropathy.

PCN is a great tool to gauge improvement in renal functions especially in patients with benign causes, presenting as acute outflow obstruction.

In patients with chronic obstructive uropathy, and with advanced malignancy, PCN use should be justified with keeping in mind of ESRD which is seen more in these patients as they will require increased hospital stay and resources than benign causes.

We recommend Ultrasound guided Percutaneous nephrostomy as a first choice interventional modality in emergency PCN. Ultrasound guided Percutaneous nephrostomy is reliable, economical, has no radiation hazard and has a very low complication rate in patients of obstructive uropathy.[40]

Conflicts of interest

The authors declare no conflicts of interest. All of data was collected by self study and through extensive literature research done on internet search engines. No monetary benefit or any sponsorship was involved at any step of this systemic review. All the data was already present on websites like PubMed, MEDLINE, EMBASE, Scopus, CINAHL, Cochrane library, Clinicaltrials.gov, Google Scholar and individual urological journals up to March 2020.

Conflict of Interest: None

References

1. Shyam Talreja, Indraneel Banerjee, Ramdayal Teli, A Spectrum of Urological Emergency Reported at a Tertiary Care Teaching Hospital: An Experience
2. Kouba E, Wallen EM, Prothi RS. Management of ureteral obstruction due to advanced malignancy: optimizing therapeutic and palliative outcomes. J Urol. 2008;180(2):435-6.
3. Radecka E, Magnusson M, Magnusson A. Survival time and period of catheterization in patients treated with percutaneous nephrostomy for urinary obstruction due to malignancy. Acta Radiol. 2006;47(3):328-331.
4. Wong LM, Cleeve LK, Milner AD, Pitman AG. Malignant ureteral obstruction: outcomes after intervention. Have things changed? J Urol. 2007;178:178-83.
5. Naeem M, Jan MA, Ullah A, Ali L, Khan S, ul Haq A et al. Percutaneous nephrostomy for the relief of upper urinary tract obstruction: an experience with 200 cases. JPMI. 2010;24(2):147-52.
6. Goodwin WE, Cassey WO, Wool FW. Percutaneous trocar (Needle) nephrostomy in hydronephrosis. JAMA. 1955;17:891-4.
7. Gupta S, Gulati M, Suri S. Ultrasound-guided percutaneous nephrostomy in non-dilated pelvicaliceal system. J Clin Ultrasound. 1998;26:177-9.
8. Ahmad I, Pansota MS, Tariq M, Saleem MS, Tabassum SA, Mujahid AH. Comparison between double J (DJ) ureteral stenting and percutaneous nephrostomy (PCN) in obstructive uropathy. Pak J Med Sci 2013; 29(3): 725-29.
9. Jalbani MH, Deenari RA, Dholia KR, Oad AK, Arbani IA. Role of percutaneous nephrostomy (PCN) in malignant ureteral obstruction. J Pak Med Assoc. 2010; 60(4): 280-3.
10. Millward SF. Percutaneous nephrostomy: A practical approach. J Vas Interv Radiol. 2000;11:955-64.
11. Baishya RK, Dhawan DR, Jagtap J, Sabnis R, Desai MR. Percutaneous nephrostomy under ultrasound guidance. Indian J Nephrol. 2011;21(1):67.
12. Richard L. Baron,1 Joseph K. T. Lee, Bruce L. McClennan, and G. Leland. Percutaneous Nephrostomy Using Real-Time Sonographic Guidance
13. Vesey SG, Lumb GN, O'Boyle PJ. An evaluation of urologist-operated ultrasound and its use in the urological out-patient clinic. Br J Urol. 1988;61(1):74–76

14. Archer BR, Wagner LK. Protecting patients by training physicians in fluoroscopic radiation management. J Appl Clin Med Phys 2000; 1:32-37
15. Iftikhar Ahmad, Mudassar Saeed Pansota, Muhammad Tariq. Complication of percutaneous nephrostomy (pcn) in upper obstructive uropathy: our experience .
16. http://www.prismastatement.org/#:~:text=PRISMA%20is%20an%20evidence%2Dbased,research%2C%20particularly%20e aluations%20of%20 interventions.
17. Liaqat Ali, Saifullah Khan, Faiza Hayat. Comparison of percutaneous nephrostomy and double j stent in early normalization of renal function tests in patients with obstructive uropathy due to urolithiasis.
18. Muhammad Naeem, Mir Alam Jan, Anayat Ullah. Percutaneous nephrostomy for the relief of upper urinary tract obstruction: an experience with 200 cases.
19. Iftikhar Ahmed, Imtiaz Hussain Rizvi, Mohammad Nadeem Ahmed. Effectiveness of Percutaneous Nephrostomy in Reversing Obstructive Renal Failure.
20. JR Wilson, GH Urwin, MJ Stower. The role of percutaneous nephrostomy in malignant ureteric obstruction.
21. Subrata Kumar Das, Anshuman Panda, Tapas Ranjan Gupta. Role of proximal drainage in obstruction in the urinary tract: an observational study.
22. Matthys Cornelis van Aardta*, Judith van Aardta , Arnold Moutona.Impact of percutaneous nephrostomy in South African women with advanced cervical cancer and obstructive uropathy.
23. Gaurav Garg, Nupur Bansal, Manmeet Singh. Role of percutaneous nephrostomy in bladder carcinoma with obstructive uropathy: A story revisited .
24. Albert C. Li, M.D. 1 Sidney P. Regalado, M.D. Emergent Percutaneous Nephrostomy for the Diagnosis and Management of Pyonephrosis.
25. G. Sood, A. Sood, A. Jindal.Ultrasound Guided Percutaneous Nephrostomy for Obstructive Uropathy in Benign and Malignant Diseases.
26. Grabstald H, McPhee M. Nephrostomy and the cancer patient. Southern Med J 1973; 66: 217–20.
27. Pergialiotis V, Bellos I, Thomakos N, et al. Survival outcomes of patients with cervical cancer and accompanying hydronephrosis: A systematic review of the literature. Oncol Rev. 2019;13(1):387. Published 2019 Jan 15. doi:10.4081/oncol.2019.387.
28. Lessne ML, Holly B, Huang SY, Kim CY. Diagnosis and management of hemorrhagic complications of interventional radiology procedures. Semin Intervent Radiol. 2015;32(2):89-97. doi:10.1055/s-0035-1549373
29. Glenn M. Preminger , MD, Duke University Medical Center Obstructive Uropathy Last full review/ revision Nov 2020| Content last modified Nov 2020.
30. Michael A Policastro, MD; Urinary Obstruction Treatment & Management https://emedicine.medscape.com/article/778456-treatment.
31. Grace G. Zhu, Soroush Rais-Bahrami. Diagnosis and Management of Obstructive Uropathy in the Setting of Advanced Pelvic Malignancies.
32. Dilip Kumar Pal, Surajit sasmal. Clinical Profile and Treatment Outcome of Obstructive Uropathy in a Tertiary Care Centre, April 2017.
33. Harrison Alter, Eric Snoey. Obstructive Uropathy: A Clinical Update.
34. Ernie Yap, Moro Salifu, Tahir Ahmad. Atypical Causes of Urinary Tract Obstruction
35. Frederico R. Romero; Marcos Broglio; Silvio R. Pires; Indications for percutaneous nephrostomy in patients with obstructive uropathy due to malignant urogenital neoplasias Int. braz j urol. vol.31 no.2 Rio de Janeiro Mar./Apr. 2005
36. Shilpa Sharma, Manoj Joshi, Devendra K Gupta. Consensus on the management of posterior urethral valves from antenatal period to puberty. Journal of Indian Association of Pediatric Surgeons,2019.
37. New F, Deverill S, Somani BK. Role of percutaneous nephrostomy in end of life prostate cancer patients: a systematic review of the literature. Central European Journal of Urology. 2018 ;71(4):404-409. DOI: 10.5173/ceju.2018.1780.
38. Shoshany, O., Erlich, T., Golan, S. et al. Ureteric stent versus percutaneous nephrostomy for acute ureteral obstruction - clinical outcome and quality of life: a bicenter prospective study. BMC Urol 19, 79 (2019)
39. Francesca new Bhaskar Somani .Short and long-term quality of life (QoL) in patients with percutaneous nephrostomy (PCN), and comparison to other forms of urinary drainage. Systematic review of literature.
40. Huan Wang, Chuang Cao, Chang-hui Wang. Ultrasound-Guided Percutaneous Nephrostomy: How to Select Technique? International Journal of Anatomy, Radiology and Surgery, 2016 Apr, Vol 5(2) 35-40.

Authors Contribution

A.Z: Literature Search, Data Collection

M.N.A: Conceptualization of Project,Drafting

N.S: Writing of Manuscript, Revision, Data Collection

M.F: Literature Search, Statistical Analysis

Sedation in COVID-19 Patients & Limited Resources: A Challenge for the Developing Countries

Mohsin Masud,[1] Lala Rukh Bangash[2]

***How to cite*: *Masud M., Bangash R.L. Sedation in covid-19 patients & limited resources: a challenge for the developing countries. Esculapio 2021;17(02):207-208.*
DOI: *https://doi.org/10.51273/esc21.25172*

In the early days of December 2019 in China, cases of pneumonia of unknown etiology emerged. On December 31st, the disease was identified to be caused by NOVEL CORONA VIRUS. On February 11, 2020, WHO named this disease as coronavirus disease 2019, briefly called as covid-19. The disease spread across the borders of China. It was declared as pandemic by WHO on March 11, 2020.[1] The disease severity ranges from mild to severe. Most mild cases report having fever, myalgias, fatigue and dry cough while the severe cases develop pneumonia requiring supplementary oxygenation or even ventilatory support.[2] Covid-19 has various extrapulmonary manifestations as well. These include thrombotic events causing myocardial ischemia and arrhythmias, hepatocellular injury, gastrointestinal symptoms, acute kidney injury, neurological illness, hyperglycemia and ketosis.[3] Studies have shown that approximately 14% of covid-19 patients develop severe symptoms and 5% need mechanical ventilation.[4] All these critically ill patients end up in ICU requiring highly specialized care. It must be kept in mind that the disease affects young as well as elderly people with most cases lying between age of 30 to 79 years.[5] With the increasing severity of covid-19, the degree of hypoxemia increases, causing air hunger in the patient. The anxiety of the illness and hypoxemia adds to the distress of the patients. The physician working in the intensive care units are met with the challenge of not only adequately ventilating these patients but also appropriately sedating them. These patients require good anxiety relief and analgesia. Considering the fact that many of these critically ill patients belong to younger age groups and limited availability of drugs in the developing countries, the aspect of sedation of covid-19 patients requires much attention. Here we discuss some of the challenges faced in this scenario and briefly outline the management strategies.

Analgesia and sedation go side by side in critically ill covid-19 patients. Sedating the patients without adequate pain relief increases the risk of delirium and increase the release of endogenous catecholamines leading to increased risk of myocardial ischemia and hypermetabolic states. So, a combination of a sedative agent with suitable analgesic agents, offers better management option for these patients. Fentanyl is one of the most common drugs used for analgesia and sedation in ICU. It has been a cornerstone for analgesia as well as sedation in covid-19 patients. However, in the scenario of very limited supply of Fentanyl in our country, other options can be utilized. Continuous infusion of nalbuphine in a dose range of 15 ug/kg/hour to 60 ug/kg/hour can be administered to the patients in combination with benzodiazepines like midazolam. Although, relatively higher doses of opioid infusion are effective in controlling patient-ventilator dys synchrony during mechanical ventilation, they may cause many unwanted side effects like gut hypomotility and chest wall rigidity.[6] Non opioid analgesics including ketamine, acetaminophen, dexmedetomidine, lidociane and gabapentin can also be used as an adjuvant with opioid drugs. Their addition to the analog-sedition regimen reduces the dose requirement of opioids, thereby reducing their side effects.

No sedative agent is ideal. The spectrum of covid-19 patients is very wide. Many critically ill covid-19 patients belong to young age group. Prior to getting ill with covid-19, majority of these are healthy and robust with no co-morbidities. These patients frequently require higher levels of sedative drugs to achieve optimum level of sedation and minimize risk of accidental extubation as reintubating such patients increases the risk to the health care provider of catching covid-19. Multimodal approach of sedation should be considered in these patients. Among the

various options available for sedation, propofol is the most commonly used agent followed by dexmedetomidine and benzodiazepines. On the other hand, elderly patients present an entire different spectrum. Frail health status along with the development of multi-organ dysfunction demands the choice of sedatives to be tailor made. These patients often require minimum level of sedation. So, choosing the right drug in right dose is of utmost importance in such patients.

The need of prolonged infusion of sedative and analgesic drugs in the scenario of continuous influx of new critically ill covid-19 patients put a strain on the availability of these drugs. Here again the use of non-conventional drugs such as barbiturates, lignocaine, gabapentin and propranolol as an adjuvant can be considered.

In the nutshell, not all covid-19 patients can be equally treated in terms of ICU sedation. The choice and dose of analgesic and sedative agents must be individualized. Use of non-conventional drugs as adjuvant may be considered. However, attention must be paid to the potential drug interaction when different agents are used in conjunction. The ultimate approach to be followed by the intensivists is to be flexible in their approach

Refrences

1. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, Evaluation, and Treatment of Coronavirus (COVID-19). 2021 Jan 16. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan–. PMID: 32150360.
2. He F, Deng Y, Li W. Coronavirus disease 2019: What we know?. *J Med Virol*. 2020;92:719-25.
3. Gupta A, Madhavan MV, Sehgal K, Nair N, Mahajan S, Sehrawat TS, et al. Extrapulmonary manifestations of COVID-19. *Nat Med*. 2020;26:1017-32.
4. Alhazzani W, Moller MH, Arabi Y, et al. Surviving Sepsis Campaign: Guidelines on the management of critically ill adults with coronavirus disease 2019 (COVID-19). Int Care Med. 2020. Epub ahead of print 28 March. https://doi.org/10.1007/s00134-020-06022-5
5. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72314 cases from the Chinese center for disease control and prevention. JAMA. 2020. 10.1001/jama.2020.2648. [published online ahead of print February 24, 2020].

   Ammar
6. MA, Sacha GL, Welch SC, Bass SN, Kane-Gill SL, Duggal A. Sedation, Analgesia, and Paralysis in COVID-19 Patients in the Setting of Drug Shortages. J Intensive Care Med 2021 ;36:157-74.

A Rare Occurrence of Jejunal Diverticula in a 52-Year-Old Male on Barium Meal & Follow Through: A Case Report

Khurram Khaliq Bhinder,[1] Shaista Riaz,[2] Ameena,[3] Afaf Arif,[4] Zouina Sarfraz,[5] Azza Sarfraz[6]

Abstract

The small bowel pathology, namely jejunal diverticula has a worldwide prevalence of 0.5-1%. Jejunal diverticula mainly occurs as a pulsion diverticula secondary to intestinal dyskinesia. In most cases, diverticula are asymptomatic, but when symptomatic patients present with chronic symptoms such as pain, nausea, obstruction and peritonitis. We report a rare case of jejunal diverticula in a 51-year-old-male with presentation of severe epigastric pain, nausea, vomiting, abdominal fullness and absolute constipation, who was surgically managed with good post-operative prognosis.

Keywords: Jejunal Diverticula; Barium Meal; Barium Follow; Obstruction; LMIC; Pakistan

How to cite: *Bhinder K.K, Riaz S., Ameena., Arif A., Sarfraz Z., Sarfraz A. A Rare Occurrence of Jejunal Diverticula in a 52-Year-Old Male on Barium Meal & Follow Through: A Case Report. Esculapio 2021;17(02):209-211.*

DOI: ***https://doi.org/10.51273/esc21.25172***

Introduction

The small bowel pathology, jejunal diverticula has a prevalence of 0.5-1%.[1] The true incidence may be higher because majority of jejunal diverticula are asymptomatic and essentially remain undiagnosed. Jejunal diverticula mainly occurs as pulsion diverticula secondary to intestinal dyskinesia.[2] While the pathology is asymptomatic in most patients, chronic symptoms such as pain, nausea, obstruction and peritonitis may be present.[3] We report a rare case of jejunal diverticula with presentation of severe epigastric pain, nausea, vomiting, abdominal fullness and absolute constipation, who was surgically managed with good post-operative prognosis.

Case Presentation

A 52-year-old male presented with an 8-year history of gastric ulcers with symptoms of epigastric pain. The epigastric pain was increasing in nature for the past 2-3 years. Post referral from the surgical department, the patient complained of severe epigastric pain, nausea, vomiting, abdominal fullness and absolute constipation for 2 weeks in the gastroenterology outpatient department. While the systemic examination was seemingly normal. Relevant abdominal examination revealed soft non-tender abdomen. No organomegaly was noted on superficial and deep palpation. Routine blood examination was also normal. Ultrasonography (USG) and barium follow through was advised and the patient was admitted for diagnostic laparoscopy. An ultrasound scan was conducted, which revealed no abnormalities. Barium follow through showed dilated proximal jejunal loops in the right hypochondrium confirming a stricture with proximal dilatation and delayed transit of contrast. The duodenojejunal junction was at its normal position **(Figures 1-4)**. A provisional diagnosis of jejunal obstruction was made based on barium study findings, possibly due to jejunal diverticula, band, or stricture.

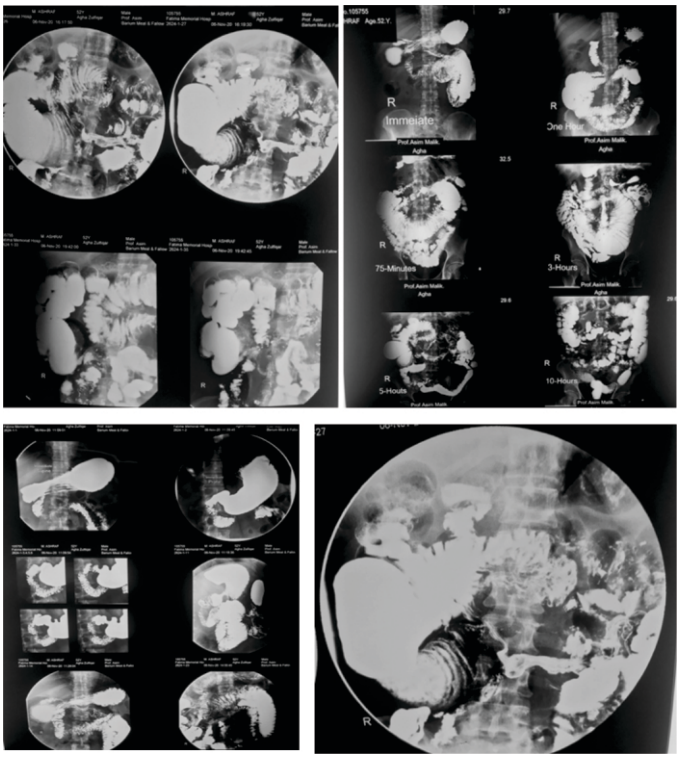
Barium follow through revealed dilated proximal jejunal loops in the right hypochondrium showing a stricture with proximal dilatation and delayed transit of contrast. Duodenojejunal junction was at its normal position.

1. Khurram Khaliq Bhinder
2. Shaista Riaz
3. Ameena
4. Afaf Arif
5. Zouina Sarfraz
6. Azza Sarfraz

1. Radiology, Shifa International Hospital, Islamabad, Pakistan
2. Radiology, McGill University, Montreal, Canada
3. Lahore General Hospital, Lahore, Pakistan
4. Radiology, Ittefaq Hospital, Lahore, Pakistan
5. Research & Publication, Fatima Jinnah Medical University, Lahore, Pakistan
6. Pediatrics & Child Health, The Aga Khan University, Karachi, Pakistan

Correspondence:
Dr. Khurram Khaliq Bhinder, *Radiology, Shifa International Hospital, Islamabad, Pakistan, kkbhinder@yahoo.com*

Submission Date: 13-03-2021
1st Revision Date: 18-03-2021
Acceptance Date: 22-04-2021



Figures 1-4. *Barium follow through studies.*

A decision was made to proceed with diagnostic laparoscopy followed by exploratory laparotomy and adhesiolysis, with Roux end to side anastomosis of jejunum completed. After aseptic measures, single port diagnostic laproscopy was proceeded. Operative findings were noted and an upper midline vertical incision made on the abdomen. Rectus sheath and peritoneum were opened, along with gut examination from the duodenojejunal flexure to the caecum. A suspicious nodule and band in addition to around one half feet of jejunum diverticulum were excised and end to side anastomosis was done. Hemostatsis was secured, a wide bore drain was placed in the pelvis, and the rectus sheath was closed. The skin closed with polypropylene sutures, and an aseptic dressing was applied. Operational findings revealed dilated proximal jejunum obstructed by jejunal diverticula causing internal herniation about axis of mesentery. Multiple bands formed at the base of the mesentery and an incidental finding of a nodule at the anti-mesenteric border of the distal ileum was made. Excised nodule and jejunal diverticulum were sent for biopsy. Nodule biopsy revealed a fibrous mass of abnormal tissue with fat necrosis and calcification. Small bowel with diverticula and mesenteric fibrosis was found on jejunal diverticula biopsy. Both resection margins were viable, and one reactive lymph node was also seen. In the post-operative phase, the patient was NPO until further notice and maintained on different injections including Tigecycline generic injection, Omson generic injection and Anthem injection. The patient made a slow yet steady recovery. The patient was discharged on Day 6 post-operation and followed-up in the outpatient department 3 weeks later. There were no further reports of discomfort and he was discharged from surgical follow-up.

Discussion

Dating back to Somerig in 1974 and Astley in 1807, jejunal diverticula (JD) was termed for mucosal and submucosal herniation of the mesenteric portion of the small intestinal wall along the muscular layer.[1] The incidence of diverticula is highest in the proximal jejunum (75%) followed by the distal jejunum (20%) and the ileum (5%). Elderly males (mostly at the age of 62) are commonly which is in the age range of our patient.[3] The etiology of JD is thought to be the result of abnormal peristalsis, intestinal dyskinesia and increased intra luminal pressure.[4] JD are incidentally found on small bowel radiology such as double contrast electrolysis or during surgical procedures as in our case.[3] Even though the jejunal diverticula are mostly asymptomatic, complications are seen in 10-30% cases. The complications of jejunal diverticula include bleeding, diverticulitis, intestinal obstruction and perforation.[5]

Jejunal diverticulosis is typically difficult to locate via an endoscopic approach, with current imaging techniques containing to be unreliable.[6] Commonly, barium follow-through studies and abdominal CT are helpful, although enteroclysis remains the investigation of choice. In the case of acute jejunal diverticula complications, urgent laparotomy is indicated as a diagnostic and therapeutic measure. Various cases have had success with complete small bowel resection with primary entero-entero anastomosis.[6] Due to the low incidence of disease and unreliable diagnostic imaging in emergency departments, the diagnosis and subsequent management of diverticular disease is challenging, the treatment is often delayed for days or weeks post the initial presentation. It is essential to suspect and diagnose jejunal diverticula in similar presentations, and to consider laparotomy and surgical resection as preferred treatment choices.

Conclusion

Jejunal diverticula are often overlooked as a possible source of abdominal discomfort or infection in elderly patients, due to its rare occurrence. The findings are often elucidative as surgical presentations. Various

therapies may be employed depending on the general state of the patient the severity of disease. While non-surgical treatment may be considered sufficient for jejunal diverticula without peritonitis or abscess, emergency surgical treatment with resection of the affected segment and primary anastomosis is mandated.

Conflicts of Interest **None**

References

1. Sarıtaş AG, Topal U, Eray İC, Dalcı K, Akçamı AT, Erdoğan K. Jejunal diverticulosis complicated with perforation: A rare acute abdomen etiology. Int J Surg Case Rep. 2019. doi:10.1016/ j.ijscr. 2019. 09.013
2. Horesh N, Klang E, Gravetz A, et al. Jejunal Diverticulitis. J Laparoendosc Adv Surg Tech. 2016. doi:10.1089/lap.2016.0066
3. Singh S, Sandhu H, Aggarwal V. Perforated jejunal diverticulum: A rare complication. Saudi J Gastroenterol. 2011. doi:10.4103/1319-3767.84502
4. Nejmeddine A, Bassem A, Mohamed H, Hazem BA, Ramez B, Issam BM. Complicated jejunal diverticulosis: A case report with literature review. N Am J Med Sci. 2009.
5. Baksi A, Gupta S, Kumar S, Ray U. Perforated isolated jejunal diverticulum: A rare aetiology of acute abdomen. BMJ Case Rep. 2014. doi: 10.1136/ bcr-2013-201533
6. Lee BJ, Kumar P, Van den Bosch R. Jejunal diverticula: a rare cause of life-threatening gastrointestinal bleeding. J Surg Case Reports. 2015. doi: 10.1093/jscr/rju150

Authors Contribution

K.K.B: Conceptualization of Project

S.R: Data Collection

A: Literature Search

A.A: Statistical Analysis

Z.S: Drafting, Revision

A.S: Writing of Manuscript

INSTRUCTION TO AUTHOR

The 'Esculapio' agrees to accept manuscripts prepared in accordance with the "Uniform Requirements submitted to the Biomedical Journals" as approved by the International Committee of Medical Journal Editors (ICMJE) guidelines. All authors are asked to follow standardized checklists for different types of publications available on https://www.equator-network.org/

Plagiarism:

Manuscripts are screened for plagiarism using Trunitin software.

Covering Letter

- The corresponding author should submit a covering letter to the editor stating the importance and purpose of study.
- He/she should provide the details of all authors including their names, emails and complete name of institutes.
- Please declare conflict of interest and any funding source.

Ethical Approval Letter:

All authors are required to submit Ethical Approval Letter from Institutional Review Board (IRB) where study is conducted. It is mandatory requirement for all research articles submitted to Esculapio.

General Principles:

1. Manuscript must be written in British English.
2. Manuscript should be typed on A-4 size paper (8.5 x 11 inches or 21.6 x27 cm) white paper with margins of 1 inch.
3. Type on one side of the paper with double spacing.
4. All pages should be numbered on the lower right hand side of manuscript.
5.The article should be formatted accordingly on MS Word:

- Font Type: Times New Roman
- Font Size: 18 for article title, 14 for article text
- Line spacing should be set at 1.5 throughout the text

Title page:

The title page should include the following: article title, article category, abstract word count, manuscript word count, number of references, and the number of tables and figures.

- The title length should not exceed more than 14 words.
- Do not capitalize the first letter of each word in the title unless it is a proper noun.
- Do not use abbreviations in the title.
- Manuscript should be submitted with a covering letter signed by all authors, clearly mentioning name of corresponding author.
- Sequence of authors, once signed and submitted, cannot be changed.
- Clearly identify full names, designations, quali;cations, e-mails and institutes of all the authors.
- The journal will only contact to corresponding author.
- Explain role of each author in the study next to the title page.
- Authors must also submit a copy of ethical permission letter from the institutional review board or institution head where the research study was conducted.

Conflict of interest:

Authors should provide declaration of conflict of interest and funding information with regard to the research.

Instructions about formats of different Manuscripts:

Original Research Article should be written under following headings:

- Abstract
- Introduction
- Material & Method
- Result
- Discussion
- Conclusion

Words counts: 3000-3200 words, excluding abstract and references.
Maximum 3 tables or figures.

- Up to 25 references.
- Should be exclusively submitted to Esculapio.

Manuscript formatting – Abstract:-

Structured abstract: Approx 250 Words, under headings of ;

- Objective
- Materials and methods
- Results
- Conclusion
- Key words must be according to Medical Subject

Headings (MeSH) , List of index

Un-Structured abstract: Approx 150 Words

Article categories

- Case report
- Case series
- Narrative review
- Short communication
- Short report and special communications

Introduction

Describes background and objective of the study do not include data or conclusion from the current study .

Method:-

The following heading should be used for the methods section, as appropriate:

- Subjects and methods
- Patients and methods
- Materials and methods

a. Selection and description of participants

The inclusion criteria of the study participants, which may be patients, healthy controls or healthy subjects, should be clearly described. Exclusion criteria need to be explained.

b. Technical Information & equipments

Recognized the method, procedures and any equipments (manufacturer's name and address) in detail so that workers easily reproduce them and also give references to establish methods including statistical method . All drugs and chemicals should be described in generic name(s), dose(s), and route(s) of administration.

Statistics

Simple way is used to describe statistical method so that reader enable to access the original data to correct the results. Statistical software should be mentioned.

Results

- Results should be described in a logical sequence in the text, tables and illustrations.
- Summarize important observations.
- Frequencies and percentages both should be mentioned.
- Exact p values should be reported.
- Mean should be with standard deviations.

Discussion:-

Summarize main results and compared with results of other published studies.

Emphasize new findings of research.

Conclusion:-

Findings which has been shown in the results should not be included in conclusion.

Conclusion should be a brief summary of the study.

References:-

Vancouver style should be used, if there are more than six authors, write et al after the first six names.

A table is provided below as summery of above mentioned information.

Manuscript TypeAbstract StructureAbstract WordCountMaximum AuthorsWordcountNumber of ReferencesTotal Tables & Figures AuditStructured25063000253Case ReportUnstructured15061250102Letter to the EditorNANA340051Original Articlestructured25063000253Review Articlestructured25064000403Editorial——10008-20–**Processing charges**:

All manuscripts from Pakistan have processing charges of Rs. 3, ooo/- (nonrefundable). Overseas US$ 50/-

Publication charges:

Once the manuscript is accepted for publication, the authors are required to pay publication charges of R s. 7,000/(-in case of overseas US$100/-) For colored

photograph extra Rs 1,000/-.

Payment mode:

The Processing & Publication charges can be sent directly to our bank account

The relevant bank account details are as under:

Title of account: ESCULAPIO

Account number : 6010042806500015

Name of Bank: The Bank of Punjab, services hospital branch, jail road ,Lahore

Printed copy: Three printed copies will be supplied to the correspondence author. Authors can order additional copies at the rate of Rs 1000/- per copy

Covering Letter

To,

The Editor in Chief,
ESCULAPIO,
Journal of Services Institute of Medical Sciences, Lahore.

From:

Name of correspondent author: _____

Postal address: _____

_____ Date of Submission _____

Cell. No: _____ E-mail._____

Solemnly declare that my/our article titled "_____

_____"

has not been submitted to any other journal within country and abroad for publication and if approved for publication in quarterly basses of "ESCULAPIO", it will not be submitted again elsewhere. I/we further declare that it is review article/original article/ case report.

Undertaking

Sr. No	Author's Name	Designation	Department/Institution	Email	Signature
1					
2					
3					
4					
5					
6					

Type of Article: Original Article…… Review Article……. Case Report…….. Other…..

Sr. No	Author's Name	Contribution
1		Conceptualization of Project
2		Data Collection
3		Literature Search
4		Statistical Analysis
5		Drafting, Revision
6		Writing of Manuscript

*(The copies of article once submitted will not be returned irrespective of its publication)