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Accuracy of Reagent Strips in Rapid Diagnosis of Spontaneous Bacterial Peritonitis (SBP)

A Case Study of Multidimensionality of Organizational Culture

A 5 Years Review of Maternal Mortality at FMH

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Original Article

Role of Modified Alvarado Score in diagnosing Acute Appendicitis in Emergency Setup

Ahsan Khan, Wasim Hayat, Awais Amjad, Hasan Imtiaz, Mashhood Rao and Mahmood Ayyaz

Objective: The objective of the study was to evaluate the diagnostic accuracy of modified alvarado score on patients presenting in surgical emergency with suspicion of acute appendicitis.
Material and Methods: We studied the Alvarado score of 200 patients in 11 months period who presented to the emergency department with right iliac fossa pain. We decided to design this study with the aim of investigating whether the Alvarado Score can be used by emergency doctors as a criteria for diagnosing acute appendicitis. We compared the Alvarado Score with the operative findings and grade of appendicitis.
Results: A total of two hundred patients were studied. We found that patients who had a score of less than 5 had a normal appendix, but at the same time 17% had acute appendicitis. While if, Alvarado Score >5, 59% had acute appendicitis and 1% have normal appendix. Thus the Alvarado Score is both specific and sensitive in diagnosis of acute appendicitis.
Conclusion: It is concluded that Alvarado score is a free and easy to use tool and is very helpful in diagnosing acute appendicitis and decreasing the incidence of negative appendectomies.
Key words: Appendicitis, Alvarado score, Emergency, Acute abdomen, Modified Alvarado score, TLC count.

Introduction

Acute appendicitis is the most common cause of an 'acute abdomen' in young adults and as such the associated symptoms and sign have become a paradigm for clinical teaching.[7]

The clinical signs and symptoms of acute appendicitis were first reported by Fitz[2] in 1886.[1,4] These fickle sign and symptoms can confuse junior surgeons who are responsible for making diagnosis in emergency and they may be wrong in 50% of time.[2,3] Even with the aid of some special investigation, like ultrasono- graphy, false positive diagnosis ranges between 20 and 40%.[6] The reported life time prevalence is as high as one in seven.[6] Appendicitis is principally the disease of young and middle aged. The peak age group is 11-30 years in both sexes. After the age of 50 years, the incidence of this disease is only 1:35 for women and 1:50 for men.[9]

The incidence of primary appendectomy is approximately equal in both sexes.[9] However, it is difficult to diagnose in very young or elderly patient and women of reproduction age due to atypical symptoms.[6] The aim of surgeon is to make an accurate diagnosis as early as possible to make treatment of high risk patient more effective.[7,8] Diagnosis of acute appendicitis remains a difficult problem due to atypical presentation and because of the fact that most other conditions also mimic appendicitis.[10,11] The diagnostic accuracy varies from 25 to 90%, optimum accuracy rate is about 80% and diagnostic error rate is 25% and is twice as common in female as in males.[10]

Constant pain localized in right lower quadrant of the abdomen is the only persistent symptoms of acute appendicitis.[12,13]

Pain in right lower quadrant or lower abdomen creates a diagnostic problem as a large number of condition such as pelvic inflammatory disease. Ruptured griffin follicles, ectopic ruptured grafting follicles, ectopic gestation, salpingitis, might ureteric colic and ovarian torsion come into the differential diagnosis.[15]

Various scoring systems have been developed to make an objective score for diagnosing acute appendicitis.[13,14]

Of these the Alvarado Score (Fig. 1) is the most widely used and accepted score.[16,17,18] The Alvarado Scoring System is a clinical assessment tool that gives a numerical score to each of the following clinical findings:

Migration of right iliac fossa pain, nausea/vomiting, anorexia, right iliac fossa tenderness, elevation of temp >37.3°C, rebound pain in right iliac fossa, leukocytosis and shift to left. Tenderness and leukocytosis are given score of 2, whereas the others are given a score 1.

Purpose of Study

This study has following aims and objectives:

1. To calculate the Alvarado Score on all patients presenting in emergency with right iliac fossa pain and correlate it with the operative findings.
2. Correlate the Alvarado Score with the grading of appendicitis.
3. To reduce the complication (perforation) because of delays in diagnosis is associated with increased morbidity and mortality rates.
4. To reduce the incidence of negative appendectomies.

Material & Methods

This is an observational study which was carried out on 200 consecutive cases presenting to the emergency in Surgical Unit of Services Hospital, Lahore. The duration of this study is eleven months from Jan 2010 to Nov 2011.

At admission, all the patients were prospectively evaluated using modified Alvarado Score to determine whether they had acute appendicitis or not. There score were subsequently correlated with the clinical, operative finding and grade of appendicitis of the removed appendix. The decision to apply the score is based on the following presentation, three symptoms, three signs and one investigation. The classic Alvarado Score included left shift of neutrophil maturation (Score1) yielding a total score of 10 but Kalan et al omitted this parameter which is produce a modified score.

Alvarado scoring system.

Features	Alvarado Score	Modified Alvarado Score
Symtoms		
Migratiory right iliac fossa pain	01	01
Nausea / Vomiting	01	01
Anorexia	01	01
Signs		
Right iliac fossa tenderness	01	02
Fever > 37.3°C	01	01
Rebound pain in RIF	01	01
Laboratory Test		
Leucocytosis >10x10^3	02	02
Neutrophylic shift to left >75%	01	-
Total	10	09

Patients with a score of 1-4 are considered unlikely to have acute appendicitis.

Those with a score of 5-6 have a possible, diagnosis of acute appendicitis, and those with score of 7-9 are regarded as probable appendicitis or perforated appendix in some cases.

The modified Alvarado Score with a total score of 9 was recorded on the separate sheet attached with history chart to be completed in emergency. The score was correlated with the operative finding and grade of appendicits.

On exploration the severity of the appendicitis was assessed according to the gross appearance and the following grading was used:

Grade	Appendix
I	Normal Below 5
II	Swollen tip, Periappendicular Fluid/pus
III	Gangrenous /Perforated

Inclusion Criteria

All patients above 13 years presenting with pain in the right iliac fossa in emergency, their appendicectomies performed and those who were available for follow up for six months.

Exclusion Criteria

1. Patients less than 13 years.
2. Patients with the demonstrable extra-appendicular cause of pain in right iliac fossa.

Results

The study included 200 patients. This study comprised of 108 male and 92 female with the average age of all patient 21.6 years range (13-55 years). The preoperative Alvarado Score was correlated with the operative findings.

Table-1: Age of the patients.

Age	Male	Female
Average: 21.6 years	22.8 years	20.3 years
Range: 13-55 years	13-55 years	13-35 years

Table-2: Modified Alvarado score with TLC of all patients.

Total	Male	Female
6.32	6.10	5.67
Range: 4-9	4-9	4-8

	TLC	
Average: 9761	10497	8892
Range: 6000-18000	6000-18000	6000-12000

Table-3: Per-operative Findings (Gross).

Grade	Patients %	Operateive finding
I	23 (23%)	Normal
II	59(59%)	Inflammed
III	18(18%)	Gangrenous/ Perforated

Table-4: Alvarado Score<5.

Gade-I	Grade-II	Grade-III
23%	17%	
1.92%	76.92%	21.55%
23%	25%	75%

Table-4a: Alvarado Score>5.

Alvarado Score	Grade of Appendix
>5	59%=Acute appendicitis
<5	23%= Normal appendicititis
<5	17% Acute Appendicitis

Discussion

he diagnosis of acute appendicitis continues to be difficult due to the variable presentation of the disease and the lack of reliable biochemical and radiological diagnostic tests[6,7,8] although there has been some improvement in the diagnosis of acute appendicitis over the past several decades.[9,10]

The percentage of normal appendicitis reported in various series varies from 8 to 33% whereas the clinical Alvarado Scoring System has proved useful in the management of number of surgical condition in the past few years.[16,17,18] Various scoring system have been developed and advocated to aid the diagnosis of acute appendicitis.[12,13,14] Most of them are complex and difficult to implement in the clinical situation of an emergency room. But we have found that the Alvarado Score is a simple scoring system that can be instituted easily.

In this study we found that patients having Alvarado Score >5 are suffering from acute appendicitis.

Our study showed that the Alvarado score <5 have a normal appendix, but at the same time 17% had acute appendicitis. Where Alvarado Score >5, 59% had acute appendicitis and 1% have normal appendix. Also a score of more than 7 was present in 28% patients and all had acute appendicitis.

Thus the Alvarado Score is both specific and sensitive in diagnosis of acute appendicitis, anybody having Alvarado Score >5 had 78% specificity; and a Score <5 had 65% sensitivity. A score of >7 was 100% specific and a score of <7 was only 35% sensitive. Similarly a score of >8 was also 100% specific but only 31% sensitive to rule out appendicitis. .

Conclusion

The modified Alvarado Score is a simple score for supporting the diagnosis of acute appendicitis.

Alvarado Score can be used as an objective criterion in selecting patients for admission with suspected appendicitis. It is important to advise patients to return for review 24 hours later or if symptoms worsen. Patients who live alone and do not have family support or unwilling to be observed at home could be admitted as is our current practice.

We recommend every patient presenting to emergency with pain in right iliac fossa should undergo assessment with the Alvarado score. A score of >5 has a high probability (78%) of detecting acute appendicitis and a score of >7 has a 100% sensitivity in diagnosing acute appendicitis. A score of <5 usually means that one should search for an alternative diagnosis as a low score rules out acute appendicitis (65% specificity).

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References

1. Temple CL, Huncheros of SA. The natural history of appendicitis in adults: A prospective study. Ann Surg 1995; 221:278.
2. Burke J. Early historical aspects of appendicitis 1951;300(5): 905-17.
3. Williams GR. Presidential address. A history of appendicitis. Ann Surg 1988; 197: 495-565.
4. Seal A. Appendicitis. A historical review. Canad J Surg 1981; 24: 427-33.
5. Kazarian KK. Roeder WJ, Mersheimer WL. Decreasing mortality and increasing morbidity from acute appendicitis. Am J Surg 1970; 119: 681-85.
6. Poole GV. Appendicitis. The diagnostic challenge continues.

Am J Surg 1998; 54: 609-12.
7. Jone PF. Suspected acute appendicitis trend in management over 30 years. Br J Surg 2001; 88: 1570-7.
8. Fitz RH. Perforating inflammations of vermiform appendix with special reference to its early diagnosis and treatment. Trans Assoc Am Physicians 1986; 1: 107.
9. I'Connell PR. Vermiform appendix. In: Russell R.C.G. Williams N.S. editors Bailey & Love's short practice of syurgery, 23rd ed. London: Arnold Publishers 2000; 1076-92
10. Horrman J, Rasmussen OO. Aids in the diagnosis of acute appendicitis Br J Surg 1989; 46: 774-90.
11. Alvarado AA. Practical score for the early diagnosis of acute appendicitis. Ann Emerg Med 1986; 15: 557-64.
12. Bukhari SAH, Rana SH. Alvarado score: a new approach to acute appendicitis. Pak Armed Forces Med J 2002; 52(1): 47-50.
13. Chan MY, Teo BS, Ng BL. The Alvarado score and acute appendicits. Ann Acad Med Singapore 2001; 30: 510-12.
14. Kim HE, Park SB, Woo SU, Rho HR, Chae GB, Choi WJ. [Application of the Alvarado score to the diagnosis of acute appendicitis] J Korean Soc Coloproctol. 2006;22:229234.
15. Khawaja AR, Rasool MI, Nadeem IA. Perforated appendicitis vs non-perforated appendicitis. JPMA 1987;325-26.
16. Howell JM, Eddy OL, Lukens TW, Thiessen ME, Weingart SD, Decker WW. Clinical policy: critical issues in the evaluation and management of emergency department patients with suspected appendicitis. Ann Emer Med. 2010;55:71116.
17. Alvarado A. A practical score for the early diagnosis of acute appendicitis. Ann Emerg Med. 1986;15:557564. doi: 10.1016/S0196-0644(86)80993-3.
18. Memon AA, Vohra LM, Khaliq T, Lehri A. Diagnostic accuracy of Alvarado score in the diagnosis of acute appendicitis. Pak J Med Sci. 2009;25:118121

Original Article

ACCURACY OF REAGENT STRIPS IN RAPID DIAGNOSIS OF SPONTANEOUS BACTERIAL PERITONITIS (SBP)

Muhammad Azam,Tariq Suleman, Muhammad Aftab, Naseer Umer and Saeed uz Zaman

Objective: The objective of this study was to evaluate the accuracy of reagent strips for diagnosis of spontaneous bacterial peritonitis (SBP) in cirrhotic patients with ascites, taking polymorphonuclear cell count in ascetic fluid as standard criterion..

Material and Methods: One hundred and fifty patients having cirrhosis of liver and suspicion of SBP admitted in the medical ward of Services Hospital, Lahore were included in the study. Ascetic fluid of the patients was tested in the hospital laboratory for polymorph nuclear cell count and at the same time leukocyte esterase activity of the fluid was assessed by reagent strips. The sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of reagent strips were calculated.

Results: Frequency of SBP in cirrhotic patients with ascites was 28.67%. Specificity, sensitivity, positive predictive value, negative predictive value and diagnostic accuracy of reagent strips for diagnosis of SBP in cirrhotic patients with ascites, taking PMN cell count in ascetic fluid as standard criterion was calculated as 93.02%, 94.39%,86.97%,97.12% and 94% respectively.

Conclusion: In view of the results of the current study reagent strip method can be recommended as a rapid and accurate method for diagnosis of SBP in cirrhotic patients.

Key words: Spontaneous bacterial peritonitis, polymorph nuclear cell count, reagent strips, diagnostic accuracy.

Introduction

Cirrhosis is a serious and irreversible consequence of chronic liver disease characterized by replacement of liver tissue by fibrous tissue and regenerative nodules.[1,2] It is a major cause of mortality and morbidity worldwide. [3]. Besides other signs and symptoms of the cirrhosis, ascites is an important complication of advanced cirrhosis. It is sometimes refractory to treatment and is complicated by spontaneous bacterial peritonitis.[4,5] Spontaneous bacterial peritonitis is a frequent and serious complication in cirrhotic patients with ascites. Early diagnosis and treatment are essential for the survival of patients with SBP.[6,7] The prevalence of SBP among unselected hospitalized cirrhotic patients with ascites is up to 30%.[6,8] Unfortunately, symptoms of SBP including fever, abdominal pain, nausea and vomiting are not present is all patients with SBP.[8,9] Mortality rate due to SBP remains high; 30-50% despite a good response to antibiotic treatment. Therefore rapid diagnosis and early treatment with antibiotics is a key for improved survival.[7] A polymorph nuclear leukocyte (PMN) cell count; more then 250/mm^3 in transudative ascetic fluid irrespective of the ascetic fluid culture is currently considered to be the standard criterion for diagnosis of SBP.[3,8] However, manual ascetic fluid PMN cell count is not always available every where especially in outpatients department and more ever it takes few hours for diagnosis.

Recently, leukocyte esterase activity testing by dipstick has been used for a rapid diagnosis of infection in many body fluids such as urine, pleural fluid and cerebrospinal fluid. This test is based on the esterase activity of granulocytes present in the biological fluid, which reacts with a chemical compound on the reagent strip to cause a colour change in the azo dye. It has been proposed that reagent strip testing for leukocyte esterase may be utilized to reduce the time between performing paracentesis and obtaining a presumptive diagnosis of SBP from a few hours to a few seconds (sensitivity 97.7%, specificity 89.4 %).[10,11] Moreover, such strips would be available everywhere, and could be a useful tool for diagnosing SBP, especially in developing countries like ours.

The aim of this study was to evaluate the usefulness of dipstick in rapid diagnosis of SBP in cirrhotic patients with the locally available dipstick test.

Material and Methods

One hundred and fifty patients were included in this cross sectional survey. Sampling technique was non

Probability purposive sampling. All male and female patients coming to medical emergency of Services Hospital, Lahore, with evidence of cirrhosis and ascites on clinical & ultrasonography were included in the study.

Following patients were excluded from the study.

- Patients having exudative ascites with elevated PMN cell count in ascetic fluid as seen in tuberculosis and secondary peritionitis.
- Patients having hemorrhagic ascites.
- Patients with history of abdominal surgical procedure in the previous four weeks.

Informed consent for abdominal paracentesis was taken from the patients fulfilling the inclusion criteria. Ascetic fluid was sent to laboratory for microscopy (to determine PMN count), biochemistry (to determine protein and glucose) in disposable syringes and for culture sensitivity in blood culture bottle (to determine the mono microbial nature of infection).

The reagent strip (Multistix 10 SG®, Bayer Diagnostics) was immersed in 5ml of ascetic fluid placed in a dry and clean container as described by the manufacturer for identification of leukocyte esterase activity. After two minutes, the reagent strip was read comparing the colour of the leukocyte reagent strip area with the colorimetric 5-grad scale depicted on the bottle.

A correlation between PMN cell count and a 5-grade scale suggested by the manufacturer was as follows: grade o, 0 PMN cells/ mm 3 ; grade 1;25 PMN cells /mm3 ; grade2, 75PMN cells /mm3 grade3, 250 PMN cells / mm3 ; and grade 4, 500 PMN cells / mm3. Grade 3 and grade 4 were taken as positive for SBP.

All the data was entered and analyzed using SPSS version 10. The quantitative variable like age was presented as mean ± SD. Gender was presented as frequency and percentages. Data regarding study variables i.e. reagent strips and microscopic ascetic fluid examination was represented by bar charts, multiple bar charts as descriptive statistics. Sensitivity, Specificity, positive predictive value, negative predictive value and accuracy of reagent strip for diagnosis of spontaneous bacterial peritonitis was calculated taking PMN cell count as standard criterion.

Results

A total of 150 patients fulfilling the inclusion and exclusion criteria were enrolled to evaluate the accuracy of reagent strips for diagnosing SBP in cirrhotic patients with ascites, taking PMN cell count in ascetic fluid as standard criterion.

Ages of the patients were recorded between 46-55 years **(Table-1)**

There were 83 (55.33%) male and 67(44.067) female patients **(Table-2).**

According to the standard criterion of PMN cell count SBP was found in 43(28.67%) patients, whereas 107(7.33%) patients had no spontaneous bacterial peritonitis **(Table-3).**

Accuracy of reagent strip for diagnosing SBP in cirrhotic patients with ascites, taking PMN cell count in ascetic fluid as standard criterion revealed 40(26.67%) true positive, 6(4%) false positive, 3(2%) false negative and 101(67.33%) true negative patients for SBP.

Whereas specificity, sensitivity, positive predictive value, negative predictive value and diagnostic accuracy were calculated as 93.02%,94.39%,86.96%, 97.12% and 94% respectively **(Table-4).**

Table-1: Age distribution of the subjects (n=150).

Age (in years)	No. Of Patients	Percentage
25-35	09	6%
36-45	23	15.33%
46-55	57	138%
56-65	51	34%
66-70	10	6.67%
Total	150	100%
Mean and sd	84.54±3.65	

Table-2: Gender distribution of the subjects (n=150).

Gender	No. Of Patients	Percentage
Male	83	55.33%
Female	67	44.67%
Total	150	100%

Table-3: Frequency of SBP in cirrhotic patients with ascites (n=150).

SBP in cirrhotic patients with ascites	No. Of Patients	Percentage
Yes	43	28.67%
No	107	71.33%
Total	150	100%

Table-4:

Accuracy of reagent strips for diagnosing SBP in cirrhotic patients with ascites, taking PMN cell count in ascetic fluid as standard criterion (n=150).

Peagent	SBP In Cirrhotic Patients with Ascites		
Strips	Positive	Negative	Total
Positive	True positive (a) 40 (26.67%)	False positive (b) 6 (4%)	a+b 46(30.67%)
Negative	False negative (c) 3 (2%)	True negative (d) 101 (67.33%)	c+d 104(69.33%)
Total	A+c 43 (28.67%)	B+d 107(71.33%)	150 (100%)

Sensitivity = a / (a + c) x 1 0 0 = 9 3 . 0 2 %
Specificity = d / (d + b) x 1 0 0 = 9 4 . 3 9 %
Positive predictive value = a/(a + b) x 100 = 86.96%
Negative predictive value = d/(d + c) x 100 = 9 7 . 1 2 %
Accuracy rate = a + d / (a + d + b + c) x 100 = 94%

Discussion

Spontaneous bacterial peritonitis is a frequent and serious complication in cirrhotic patients having ascites. The prevalence of SBP among unselected hospitalized cirrhotic patients with ascites ranges between 10-30%.[12,13] Although antibiotic therapy produces a good response, the mortality rate due to SBP remains high, 30-50%.[14,15] improved survival in SBP episodes may be obtained through rapid diagnosis and treatment.

SBP is highly likely when the PMN cell count in the ascetic fluid reaches a cut off of 250/mm.[14] once this cut off has been reached antibiotic therapy must be started immediately without waiting for a culture and sensitivity report of ascetic fluid. Reagent strip testing for leukocyte esterase has been found to be a sensitive and accurate predictor for the presence of PMN cells in body fluids such as urine,[16,17] cerebrospinal fluid, seminal and peritoneal fluid.[18] This test is based on the esterase activity of granulocytes present in biological fluid which reacts with a chemical compound on the reagent strip to cause a colour change in the azo dye (purple).

This study was planned to evaluate the accuracy of reagent strips for the diagnosis of SBP in cirrhotic atients having ascites taking PMN cell count in the ascetic fluid as the standard criterion.

SBP was diagnosed in 43(28.67%), patients whereas 107(71.33%) patients had no SBP. Specificity, sensitivity, positive predictive value, negative predictive value and diagnostic accuracy of reagent strips for diagnosing SBP in cirrhotic patients with ascites, taking PMN cell count in ascetic fluid as standard criterion were calculated as 86.97%, 97.12%,93.02%,94.39% and 94% respectively.

These finding are in agreement with de aurango A[10] and sarwars[11] who recorded sensitivity as 97.7% and specificity as 89.4%.

Vanbiervliet et al showed that the multi stix 8SG rapid urine screening test had 100% sensitivity and specificity for SBP diagnosis.[19] Castellote et al demonstrated that urine screening test stick (Aution sticks) had 96% sensitivity and 89% specificity for detecting SBP in cirrhotic patients with ascites.[20]

In another study, Theovenot et al tested the reagent combur-2 test® LN) and found 89% sensitivity and 100% specificity.[21] The results of our study are comparable to the results of the above mentioned studies.

Many hospitals in our country have limited laboratory facilities or are unable to perform PMN cell counts in ascetic fluid in emergency situations. Considering the mortality from SBP, this test will help to improve the management of SBP.

Conclusion

In view of the results of the current study with comparability to other studies, this accurate method may be used everywhere, there by reducing the time from paracentesis to a presumptive diagnosis of SBP from few hours to a few seconds.

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References

1. Gildea TR, Cook WC, Nelson DR, Aggarwal A, Carey W, Younossi ZM. Predictors of long-term mortality in patients with cirrhosis of the liver admitted to a medical ICU. Am Coll Chest Physicians. 2004; 126:1598-603.
2. Runyon BA, Testa M. Hepatitis B and C. Am J Gastroenterol. 1999; 16: 835-40.
3. Maddrey WC. Update in hepatology. Ann Intern Med.

2001;13(4):21623.

4. Dib N, Oberti F, Cales P. Current management of the complications of portal hypertension: variceal bleeding and ascites. CMAJ. 2006; 174: 1433-43.
5. Gines P, Cardenas A, Arroyo V. Management of cirrhosis and ascites. N Engl J Med. 2004: 350-61.
6. Fauci AS, Kasper DL, Long DL, Braunwald E, Hauser SL, Jameson L,Harrisons principles of internal medicine.17th ed. New York:Mc Graw-Hill Inc;2008:808-09
7. van Erpecum KJ. Ascites and spontaneous bacterial peritonitis in patients with liver cirrhosis. Scand J Gastroenterol Suppl 2006; 79-84
8. Ozmen S, Dursun M, Yilmaz S. Spontaneous bacterial peritonitis: pathogenesis, diagnosis, and management. Acta Gastroenterol Belg 2006; 69: 276-R
9. Arinzon Z, Peisakh A, Shuval I, Shabat S, Berner YN Detection of urinary tract infection (UTI) in long-term care setting: Is the multireagent strip an adequate diagnostic tool? Arch Gerontol Geriatr. 2009 Mar-Apr; 48(2):227-31. Epub 2008 Mar 7.
10. de Araujo A, de Barros Lopes A, Trucollo Michalczuk M, Stifft J, Nardelli E, Escobar G, Rossi G, Alvares-da-Silva MR. Is there yet any place for reagent strips in diagnosing spontaneous bacterial peritonitis in cirrhotic patients? An accuracy and cost-effectiveness study in Brazil. J Gastroenterol Hepatol. 2008 Dec;23(12):1895-900.
11. Sarwar S, Alam A, Izhar M, Khan AA, But AK, Shafqat F. Bedside diagnosis of spontaneous bacterial peritonitis using reagent strips. J Coll Physicians Surg Pak 2005;15(7): 418-21.
12. Rimola A. Infections in liver disease. In: McIntyre N, Benhamou JP, Bircher J, Rizetto M, Rodes J, editors. Oxford Textbook of Clinical Hepatology. Oxford: Oxford University Press; 1991. p. 127284.
13. Bac DJ, Siersema PD, Mulder PGH, DeMarie S, Wilson JHP. Spontaneous bacterial peritonitis: outcome and predictive factors. Eur J Gastroenterol Hepatol. 1993;5:635-40.
14. Llovet JM, Planas R, Morillas R, et al. Short-term prognosis of cirrhotics with spontaneous bacterial peritonitis: multivariate study. Am J Gastroenterol. 1993;88(3):388-92.
15. Thuluvath PJ, Morss S, Thompson R. Spontaneous bacterial peritonitis--in-hospital mortality, predictors of survival, and health care costs from 1988 to 1998. Am J Gastroenterol. 2001;96(4):1232-6.
16. Lejeune B, Baron R, Guillois B, Mayeux D. Evaluation of a screening test for detecting urinary tract infection in newborns and infants. J Clin Pathol. 1991;44(12):1029-30.
17. Hiscoke C, Yoxall H, Greig D, Lightfoot NF. Validation of a method for the rapid diagnosis of urinary tract infection suitable for use in general practice. Br J Gen Pract. 1990;40(339):403-5.
18. López Parades A, Valera Mortón C, Ródenas García V, Pedromingo Marino A, Martínez Hernández P. Estudio de la zona de leucocitos de la tira reactiva Multistix-10-SG en líquidos cefalorraquídeo, seminal y peritoneal. [The leukocyte zone on Multistix-10-SG reactive strips for cerebrospinal, seminal and peritoneal fluids]. Med Clin (Barc). 1988;90(9):362-5.
19. Vanbiervliet G, Rakotoarisoa C, Filippi J, et al. Diagnostic accuracy of a rapid urine-screening test (Multistix8SG) in cirrhotic patients with sponta- neous bacterial peritonitis. Eur J Gastroenterol Hepatol. 2002;14 (11):1257-60.
20. Castellote J, Lopez C, Gornals J, et al. Rapid diagnosis of spontaneous bacterial peritonitis by use of reagent strips. Hepatology. 2003;37(4):893-6.
21. Thevenot T, Cadranel JF, Nguyen-Khac E. Diagnosis of spontaneous bacterial peritonitis in cirrhotic patients by use of two reagent strips. Eur J Gastroe- nterol Hepatol. 2004;16(6):579-83.

Original Article

EXCISION OF NASOPHARNGEAL ANGIOFIBROMA BY MIDFACIAL DEGLOVING APPROACH

Ghulam Murtaza, Muhammad Tariq, Nadeem Raza and M. Mujeeb

Objective: To analyze the advantages of wide exposure by midfacial degloving approach for surgical excision of Juvenile Nasopharyngeal Angiofibroma.

Material and Methods: Fifteen (15) patients with Nasopharyngeal Angiofibroma were included in the study. All were operated with midfacial degloving approach. Five cases were operated with out emobilization and 5 cases with emobilization of the feeding vessel. 5 cases were operated after temporary ligation of the external carotid artery.

Results: 15 Patients were included in the study. Excision was done with mid facial degloving approach. Results were satisfactory regarding complete excision of the tumor with less post-operative complications and recurrence (2 out of 15).

Conclusion: Midfacial degloving approach is an excellent approach providing wide exposure of infratemporal fossa, nasopharyx and skull base with less bleeding and no facial scar.

Key words: Juvenile Nasopharyngeal Angiofibroma, Midfacial degloving, emobilization.

Introduction

Nasopharyngeal angiofibroma is a common benign tumor extremely vascular with locally aggressive behavior.

It is recognized since ancient times by hippocrate. It arises from spheno palatine foramen and nasopharynx. Rarely it is found at other sites in the nasal cavity and paranasal sinuses.[1]

It is seen in young males and has a tendency to recur if not completely excised.[2,3]

Internal maxillary artery is the main feeding vessel. The tumor consists of proliferating, irregular vascular channels within a fibrous stroma, covered by nasopharyngeal mucosa. Tumor blood vessels lack smooth muscles and elastic fibers, contributing to its reputation for sustained and profuse bleeding. It presents with progressive nasal obstruction and repeated attacks of severe nasal bleeding.[4,5] Other symptoms depend upon extent of the tumor into nasopharynx, Oropharynx, infratemporal fossa, orbit, paranasal sinuses and brain.

As tumor is exclusively found in adolescent males, there is speculation that androgen receptors are present in 75% of tumor, on both vascular and stormal elements. A much smaller proportion of the tumors have progesterone receptors but estrogen receptor have not been demonstrated.[6]

The angiogenic growth factor, vascular endothelial growth factor, (VEGF) has been found on both endothelial and stromal cells.[7] Which correlates with the proliferative marker k1 67.[8] Over expression of Insulin like growth factor II (IGF-II) has also been found in large number of Juvinile angiofibroma. The IGF-II gene is situated on short arm of chromosome 11. It is thought that over expression of IGF-II might be associated with tendency of recurrence and poor prognosis.[9]

Mutations of Beta-catenin have been found in sporadic and recurrent Juvenile angiofibroma[10] X-Rays soft tissue neck lateral view showing radioluscent mass in nasopharynx and forward bowing of posterior wall of maxillary Sinus (hollman and miller sign) is an important sign of angiofibroma. Computerized tomograpahay and megnatic resonance imaging with contrast shows characteristic features of the angiofibroma which are almost diagnostic, so no need of biopsy confirmation.[11]

Several staging systems have been proposed but that of Fisch is the most common and practical.[12]

Fisch staging system of juvenile angiofibroma!

1. Tumor limited to the nasopharyngeal cavity; bone destruction negligible or limited to the sphenopalatine foramen
2. Tumor invading the pterygopalatine fossa or the maxillary, ethmoid or sphenoid sinus with bone destruction
3. Tumor invading the infratemporal fossa or orbital region
   A. with out intracranial involvement
   B. With intracranial extradural (parasellar) involvement
4. Intracranial intradural tumor:

A. With out infiltration of the cavernous sinus, pituitary fossa or optic chiasma.
B. With infiltration of the cavernous sinus, pituitary fossa or optic chiasma.

Diagnostic angiography is undertaken to evaluate the feeding vessel and as a prelude to selective emobil-ization. Per operative profuse bleeding leads to incomplete removal of tumor and recurrence which in turn leads to increased morbidity and mortality.[13]

Surgical removal is the most accepted modality of treatment.[14] Various surgical approaches are used depending upon the location and extent of the tumor. Transpalatal approach is favoured for small tumors localized in the nasopharyanx, while latral rhinotomy is more popular for removing large tumors.[15] Now a days, Fisch type 1, 2 and 3 tumors are suitable for Endoscopic resection.[16-18] Advantages of Endoscopic endonasal techniques are reduced bleeding, few post operative complications and reduced length of hospital stay. We have removed nasopharyngeal angiofibroma by using sub labial midfacial degloving approach. By using exposure offered by this approach, the anterior, medal, lateral and posterior wall of the maxillary sinus are removed. This produces a large cavity that is confluent with the nasal cavity and post nasal space and gives adequate access for the tumor removal. Extension into inferior part of orbit and infratemporal fossa can also be removed.[19]

Material and Method

This series consist of 15 cases of nasopharyngeal angiofibroma seen and diagnosed between July-2007 to July-2012. All were male and their ages between 11 to 20 years. All patients presented with nasal obstruction and nasal bleeding. CT scan with IV contrast was done in all cases. The tumors were staged according to fisch classification. All were managed surgically at the department of otorhinolaryngology and head and Neck surgery Unit-II, Services Hospital Lahore. 5cases were operated with out emobilization and 5 cases with emobilization of the feeding vessel. 5 cases were operated after temporary ligation of the external carotid artery.

Technique of Emboilization

Under local anaesthesia transfemoral route of catheterization was done, Diagnostic angiography was done first, delineating the external carotid arterial system. The catheter was advanced as close as possible to the tumor and angiogram was taken and then embolization was done with gelatin sponge particles. An immediate post emobilization angiogram is taken which demonstrated disappearance of the blush, showing effectiveness of the procedure.

Surgical Technique

This was essentially a bilateral transnasal, transmaxillary approach. The procedure was carried out though a sublabial incision leaving no visible scar. With both infra-orbital nerves safeguarded, the midface was degloved subperiosteally up to the root of the nose. Sufficient access to the nasopharynx and infratemporal fossa was obtained by removing the medial, anterior, lateral and posterior walls of the maxillary sinus, so that the nasal cavity, maxillary antrum, nasophyranx, pterygopalatine and infratemporal fossa were converted into one cavity. The exposure to the parapharyngeal space was, however, limited.

Results

All patients were male aged between 11-20 years. The average duration of surgery was 4 hours in non embolized patients while it was about 2.5 hours in embolized individuals. While it was about 3 hours in whom external carotid artery was ligated temporarily. The average blood loss in non embolized individuals was 2000 to 2500ml, in embolized individuals about 1000ml. It was about800ml inpatients in whom external carotid artery was temporarily ligated. Blood transfusion was given in all patients according to the blood loss. The follow-up period ranges from 6months to 3 years. In two cases recurrence was observed which was managed by Endoscopic excision.

Discussion

Nasopharyngeal Angiofibroma is a disease of young adolescent males. It presents with progressive nasal obstruction and repeated attacks of profuse bleeding without injury. Other symptoms depend upon extent of the disease, swelling of cheek, hearing loss secondary to eusatachian tube obstruction, mucopurulent nasal discharge, hyposmia, snoring and plummy quality of voice. More extensive tumor causing invasion of orbit and cavernous sinus causes proptosis, diplopia, visual loss and headach. Surgical resection is the most accepted modality of treatment. Small size tumors located in the nasopharanx can be dealt with trnaspalatal approach and Endoscopic excision. Profuse intera operative bleeding leeds to reoccurrence in 25 to 60% of cases. modality of treatment. Small size tumors located in the nasopharanx can be dealt with trnaspalatal

Approach and Endoscopic excision. Profuse intera operative bleeding leeds to reoccurrence in 25 to 60% of cases.

Severe intraoperative, haemorrhage can force the surgeon to abandon the procedure, leading to increased morbidity and mortality. Jawaid et al. reported a series, of 25 cases operated by transpalatal route extending the incision sublabially, for total excision of tumor extending to infratemporal fossa and cheek. Various methods have been adopted to reduce the morbidity and mortality of Nasopharyngeal Angiofibroma excision caused by intraoperative bleeding and subsequent multiple blood transfusions. This include preoperative chemotherapy with estrogeon. But this not practiced widely due to feminizing effect in adolescent boys. Non steroidal androgen receptor blocker Flutamide is used, which causes, tumour shrinkage of upto 44%, reported by gates et all.[21] External carotid artery ligation is not popular as there are incidences reported of carotid rupture. Similarly hypotensive anaesthesia also reduces blood loss.

Several centres have reported results of external beam radiotherapy for advanced disease, intracranial extension and recurrent disease (22, 23, 24). The dose of radation is 30-35 Gy in several fractions. Lateral rhinotomy with upper lip split approach is practiced by majority of surgeons. This is a very good approach for tumors extending into pterygopalatine and infratemporal fossa. Ligation of internal maxillary artery can also be done preoperatively to control haemorrhage.

Conclusion

Midfacial degloving approach: is a very excellent approach for removal of Nasopharyngeal Angiofibroma extending into the pterygop- alatine and infratemporal fossa. There is less bleeding and also no facial scar.

Preoperative embolization reduces blood loss but cost effect is a major problem in our society. Preoperative external carotid artery ligation is useful in controlling perioperative haemorrhage.

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References

1. Windfuhrjp, Remmer.s, Extranasopharyngeal Angiofibromas: Etiology, Incidence and Management Acta-ota-Laryngologyica 2004. 124: 880-9.
2. Bryan RN, Sessions RB, Horowitz BL: Radiographic managementof juvenile angiofibromas. American Journal of Neuroradiology, 1981:2: 157-166.
3. Me Combe A, Lund VJ, Howard DJ: Recurrencence in juvenile angiofibroma. Radiology, 1990, 28:97-102.
4. Lasjaunias P, Picard L, Manelfe C, Moret J, Doyon D: Angiofibroma of the nasopharynx. Journal of Neuroradiology, 1980; 7:73-95.
5. Davis KR: Embolisation of epistaxis and juvenile nasopharyngeal angiofibromas. American Journal of Roentgenology, 1987; 148:209-218.
6. Hwang HC, Mills SE, Patternson K, Gown AM. Expression of androgen receptors in nasopharyngeal angiofibroma: an immunohistochemical study of 24 cases Modern Pathology. 1998; 11:1122-6.
7. Schiff M, Gonzalez AM, Ong M, Baird A, Juvenile nasopharyngeal angiofibromas contain an angiogenic growth factor: basic FGF. Laryngoscope. 1992; 102: 940-5.
8. Brieger J, Wierzbicka M, Sokolov M, Roth Y, Szyfter W, Mann WJ. Vessel density, proliferation, and immunolocalization of vascular endothelial growth factor in juvenile nasopharyngeal angiofibromas. Archives of Otolaryngology-Head and Neck Surgery. 2004;130: 727-31.
9. Cottinho-Camillo CM, Brentani MM, Butugan O, Torioni H, Nagai MA. Relaxation of imprinting of IGFII gene in juvenile nasopharyngeal angiofibromas. Diagnostic Molecular Pathology. 2003; 12: 57-62.
10. Abraham SC, Montgomery EA, Giardiello FM, Wu TT. Frequent beta-catenin mutations in juvenile angiofibromas. American Journal of Pathology, 2001: 158:1073-8.
11. Lunb VJ, Lioyd GAS, Howard DJ; Juvenile angiofibroma: imaging techniques and diagnosis. Rhinology, 1989; 27: 179-185.
12. Andrews JC, Fisch, U, Valavanis A, Aeppli U, Makek MS, The surgical management of extensive nasopharyngeal angiofibromas with the infratemporal fossa approach. Laryngoscope. 1989; 99:429-37.
13. Steinberger SJ, Wetmore RF: Current management of juvenile nasopharyngeal angiofibroma. Transactions. Pennsylvania Academy of Ophthalmology and Otolaryngology, 1981; 37:65-70.
14. Economous TS, Abemayor E, Ward P: Juvenile nasopharyngeal angiofibroma: an update of the UCLA experience 1960-1985.

Laryngoscope, 1988; 98: 170-175.

15. Zaidi SH. Jafri IH: Surgical management of nasopharyngeal angiofibroma. Pakistan Journal of Oto-Rhino-Laryngology, 1988; 4: 77-84.
16. Roger G, Tran Ba Huy P, Froehlich P, Van den abbeele T, Klossek J-M, Serrano E et al. Exclusively endoscopic removal of juvenile nasopharyngeal angiofibromas. Archives of Otolaryngology Head and Neck Surgery. 2002; 128: 928-35.
17. Nicolai P, Berlucchi M, Tomenzoli, D, Cappiello J, Trimarchi M, Maroldi R et al. Endoscopic surgery for juvenile angiofibroma : when and how. Laryngoscope. 2003 ; 113 : 775-82.
18. Wormald PJ, Van Hasselt A. Endoscopic removal of juvenile angiofibromas. Otolaryngology Head and Neck Surgery 2003; 129: 684-91.
19. Cruz AAV, Atique JMC, Melo-Filho FV, Elias J. Orbital involvement in juvenile nasopharyngeal angiofibroma: prevalence and treatment. Ophth- almic Plastic and Reconstructive Surgery. 2004; 20: 296-300.
20. Javaid M, Mohibullah, Saeedullah, Huidayatullah: Excision of juvenile nasopharyngeal angiof- ibroma through transpalatal approach Pakistan Journal of Otolaryngology 1999; 15: 48-49.
21. Gates GA, Rice DH, Koopmann CF, Schuller DE. Flutemidein-duced regression of angiofibromas. Laryngoscope. 1992; 102: 641-4. -
22. Cummings BJ, Blend R, Keane T, Fitzpatrick P, Beale F, Clark R et al. Primary radiation therapy for juvenile naspharyngeal angiofibromas. Laryngoscope. 1984; 94: 1599-605.
23. Reddy KA, mendenhall WM, Amdur RJ, Stringer SP, Cassisi NJ, Long-term results of radiation therapy for juvenile nasopharyngeal angiofibroma. American Journal of Otolaryngology. 2001; 22: 172-5.
24. Lee JT, Chen P, Safa A, Juillard G, Calcaterra TC, The role of radiation in the treatment of advanced juvenile angiofibromas, Laryngoscope,. 2002; 112: 1213-20.

Original Article

Comparison Of Inguinal Hernia Repair Under Local Anesthesia By Surgical Trainees And Consultants

Farooq Ahmad, Muhammad Zahid, Hasan Askri and Muhammad Iqbal

Objective:
To evaluate the outcome of Lichtenstein repair under local anesthesia in term of safety, efficacy and complications and to compare the results of surgical trainees with their consultants.

Material and Methods:
All Consecutive patients with primary inguinal hernia undergoing Lichtenstein repair under local anesthesia by our trainees and consultants over a 05 year period were included into the study. Operative time, hospital stay and complications were assessed. Data was analyzed using SPSS version 17.

Results:
A total of 298patients were included in the study; 15 patients were excluded from the study due to loss of follow up. Data analysis has been done for 283 patients. All the study subjects were male with a mean age of 39.28 ± 12.61 years. Indirect inguinal hernia (91%) was the commonest, followed by direct inguinal hernia (6.7%) and sliding hernia was only in 1.6% of the patients. Majority of the hernia repairs 221(78%) were performed by the residents and only 62(21.9%) were performed by the consultants. The operative time was slightly more for residents 46.8 versus 42.8 minutes (P<0.05); whereas hospital stay was comparable between the two groups1.23 versus 1.27 days (P=0.562).
Minor postoperative complications occurred in 24(8.5%) patients. Wound infection, scrotal hematoma and chronic pain were the most common complications in 1.4% patients. All these complications were managed conservatively including wound infection. However recurrence occurred in 2(0.7%) patients of residents group.

Conclusion:
Inguinal hernia can be safely repaired under local anesthesia and it is one of the procedures that can be safely delegated to surgical trainees with comparable results with consultants.

Key words:
Inguinal hernia, local anaesthesia.

Introduction

Inguinal hernia is a common surgical problem and affects 15% of adult men and inguinal hernia repair is one of the most common surgical procedure performed worldwide.[1] Several repair methods have been discussed so far. Open repair like Lichtenstein repair under local anesthesia is safe and cost effective.[2-4] Several studies have shown that inguinal hernia repair is safe and cost effective under local anesthesia.[5-7] However there is no agreement regarding the best choice of anesthesia and inguinal hernia repair under local anesthesia is technically more demanding.[8]
In the last two decades Lichtenstein repair has been the most frequently used technique and is gold standard by American College of Surgeon.[9,10] Lichtenstein's repair learning curve is shorter than traditional groin hernioplasty and it can be performed on outpatient basis under local anesthesia.[11]

Although inguinal hernioplasty is one of the first operation performed by surgical residents, only few studies have compared the outcome of hernia repair under local anesthesia by residents and their consultants.[8,12-15] There are conflicting reports in the literature about the outcome of hernia repair by surgical residents.[16-19] This study was aimed to evaluate the outcome of Lichtenstein repair under local anesthesia in our setup and compare the results of surgical residents with their consultants in term of safety and complications.

Materials and Methods

The study was conducted at Department of Surgery Lahore General Hospital Lahore from March 2008 to March 2012. This was a prospective study of 298 patients. Adult Patients with primary inguinal hernia presenting in the outpatient department willing for hernia repair under local anesthesia were included into the study. Various surgical and anesthetic options were discussed with the patients in detail before their

Enrollment into the trial. Patient with recurrent inguinal hernia, obstructed hernia and unwilling for operation under local anesthesia were excluded. Fifteen patients were excluded from the study because of missing data. For ethical reasons no randomization technique was used, patients were marked to residents and consultants by the Head of the Department as per routine marking of the operation list.

All the patients were assessed and investigated on outpatient basis and were admitted in the morning of the day of operation. The operating surgeon obtained the informed consent and marked the hernia side before shifting to Operation Theater. All the procedures were performed by the residents were supervised by the scrubbed consultant or Senior Registrar. About 50ml of local anesthetic mixture was prepared consisting of 20 ml of 01% Lignocaine and 30ml of 0.5% of Bupivicain. Local anesthetic mixture was infiltrated along the line of incision in the subcutaneous plane, around pubic tubercle. Ilioinguinal nerve block was also administered in all patients by injecting about 5 ml of anesthetic mixture deep to external oblique aponeurosis, 2 cm antero-inferior to anterior superior iliac supine. Further infiltration was done around deep ring before dissection of hernia sac.

Herniotomy was done for indirect hernias and sac was reduced for direct hernias. Mesh repair was performed with polypropylene mesh 6×11 cm using Lichtenstein repair technique. All patients were followed in the outpatient clinic at one week and 6weeks to assess early complications and at 6 month to record recurrence. The outcome measures were operative findings, operative time, hospital stay and complications. Statistical analysis was done using SPSS 17. Quantitative variables were presented in the form of Mean ± SD. Qualitative variables were presented with percentages. Chi-square test was used to see the association between complications and status of surgeon. Independent sample t-test was also used to see the difference in hospital stay and operative time with respect to status of surgeon. P-value < 0.05 was taken as significant.

Results

During the study period a total of 298patients were included in the study; 15 patients were excluded from the study due to missing data. Data analysis has been done for 283 patients. All the study subjects were male and the mean age of study population was 39.28 ± 12.61 years. The most common variety of hernia was indirect inguinal hernia (91%), followed by direct inguinal hernia (6.7%) and sliding hernia was only 1.6%. Majority of the hernia repairs 221(78%) were performed by the residents and only 62(21.9%) were performed by the consultants. The operative time was slightly higher for residents 46.8 minutes vs 42.8 minutes for consultants (P<0.05); however hospital stay was comparable between the two groups i.e. 1.23 vs. 1.27 days (P=0.562).

Minor postoperative complications occurred in 24(8.5%) patients. Wound infection, scrotal hematoma and chronic pain were the most common complications in 1.4% patients. All these complications were managed conservatively including wound infection. There was no significant difference observed between the two groups in term of early complications (P=0.923) table 1. However recurrence was recorded in 2(0.7%) patients of residents group within the first 6months of surgery.

Table-1: Description about study Parameters.

		Age (Years)	Hospital, Stay (Days)
	N	283	
	Mean±SD	39.28±12.61	1.24±0.475
		Frequency	**Percentage**
Hernia	Right	116	41.0%
	Left	167	59.0%
	Total	283	100.0%
Operative findings	Direct	19	6.7%
	Indirect	260	91.0%

	Sliding Hernia	04	1.4%
	Total	283	100.0%
Surgeon	Consultant	62	21.9%
	Resident	221	78.1%
	Total	283	100.0%
Complecations	No Complications		0.4%
	Hematoma		0.4%
	Hydrocele	4	1.4%
	Chronic Pain	2	0.7%
	Scrotal hematoma	4	1.4%
	Serums	2	0.7%
	Stiffness	2	0.7%
	Testicular pain	2	0.7%
	Urinary retention	2	0.7%
	Wound infection	4	1.4%
	Total	283	100.0%

Table-2: Hospital stay, operative time and complications with respect to surgeon status.

	Surgeon		
	Consultan	**Resident**	**P-Values**
N	62	221	
Hospital Stay (Days)	1.27±0.518	1.23±0.46	0.562
Operative Time (Minutes)	42.76±6.64	46.76±07.03	0.000*
	5 (8.1%)	19 (8.5%)	
Complication Yes	57 (91.9%%)	204 (91.4%)	0.923

Discussion

Inguinal hernia repair under local anesthesia as a day case surgery is widely practiced in western countries but here in Pakistan still majority of inguinal hernia repairs are done under spinal or general anesthesia. Hernia repair under local anesthesia is technically more demanding and may be associated with higher recurrence rates[1,6,19] This study was aimed to assess the feasibility of performing this operation under local anesthesia here in our setup where many hernias present at a later stage and hence are less amenable to be managed under local anesthesia without significant discomfort. Second thing which was assessed in this study was the role of experience in terms of postoperative complication rate.

The audit of collective complication rates assessed in this study is acceptable when considered against international norms for this procedure. Wound infection is 0-5% in the specialized hernia centers.[24,25,26] In our study wound infection rate was 1.4% that is in line with the specialized hernia clinics. All the wound infections were managed conservatively and mesh removal was not required in any case.

Chronic pain was reported in only 4 patients in the present study. In the literature review pain has been reported in 10-30% patients after hernia repair.[8,22] In a recent study in Finland chronic pain was the most common postoperative complication after hernia repair.[23] In the present study such a low incidence of pain might be because of better endurance for pain in the study population. Our operative policy is to preserve the nerves instead of cutting them but we routinely didn't identify all the nerves. Even though many patients present in our setup at a later stage with

Hernia, local anesthesia can be safely administered and operation can be performed with acceptable complication rates and patient comfort level.

Inguinal hernia repair is generally considered an ideal operation for the training of surgical residents however few studies have documented a higher complication rate if done by the residents[17,20]. Similarly, hernia repair under general anesthesia by the trainees was associated with low recurrence; however recurrence rates were higher when hernia repair was performed under local anesthesia by surgical trainees.[17,19] In-fact, Wilkiemeyer et al reported a higher recurrence rate when open hernia repair is performed by the junior residents.[8] However these findings have not been consistently reproduced by all authors. Contrary to above authors, Cuteo Rozon et al from France concluded that Lichtenstein hernia repair can be safely performed by the supervised surgical trainees.[19] In the present study where more than two third hernia repairs were done by the surgical residents under consultant supervision, the outcome was comparable with consultants. The results reflect that proper supervision is the key and surgical residents are able to perform Lichtenstein hernia repair without jeopardizing the safety of patients.

Conclusions

The present study has clearly shown that Lichtenstein hernia repair can be safely performed under local anesthesia and the good results obtained by the surgical trainees clearly suggest that hernia repair under local anesthesia can be safely delegated to surgical trainees under supervision.

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References

1. Cheek CM, Black NA, Devlin HB. Groin hernia surgery: a systemic review. Ann R Coll Surg Eng suppl 1998; 80: S1-S20.
2. Amid PK. Lichtenstein tension free hernioplasty: its inception, evolution, and principles. Hernia. 2004;8:1-7.
3. Kurzer M, Kark A, Hussain ST. Day- case inguinal hernia repair in the elderly: a surgical priority. Hernia.2009; 13: 131-6.
4. Kulacoglu H, Ozyaylali, Yazicioglu D. Factors determining the doses local anesthetic agents in unilateral inguinal hernia repair, hernia 2009;13: 511-6.
5. Gonnullu NN, Cubukeu A. Comparison of local and general anesthesia for inguinal hernioplasty: a prospective randomized trial. Hernia 2002;6:29-32.
6. Ozgun H, Nil Kurt M, Kurt I, Cevikel MH. A comparison of local, spinal and general anesthesifor inguinal herniorrhaphy. Eur J Surg.2002; 168:455-9.
7. Nordin P,Zetterstrom, GunnarssonU, Nilsson E. Local, regional or general anesthesia in groin hernia repair: multicenter randomized trial. Lancet. 2003;362: 853-7.
8. Wilkiemeyer M, Pappas TN, Giobbie-Hurder A et al. Does resident postgraduate year influence the outcome of inguinal hernia repair. Ann Surg 2005;241: 879-84
9. Bay-Nielsen M, Kehlet H, Strand L. Quality assessment of 26304 herniorrhaphies in Denmark: a prospective nation-wide study. Lancet2001; 358: 1124.
10. National Institute of Clinical Excellence (NICE) final appraisal determination, laparoscopic surgery for inguinal hernia repair .2004 London.
11. Van Veen RN, Mahabier C, Dawson I. Spinal or local anesthesia in Lichtenstein repair: a randomized controlled trial. Ann Surg.2008; 247: 428-33.
12. Neumayer LA, Gawande AA, Wang J. Profiiency of surgeons in inguinal hernia repair. Effect of experience and age. Ann Surg2005; 242: 344-52.
13. Cuetto Rozon R, De Baerdemacker Y, Polliand C, Champault G. Surgical training and inguinal hernia repair.ann Surg.2006;131: 311-15.
14. Danielsson P, Isacson S, Hansen MV. Randomised study of Lichtenstein compared with Shouldice inguinal hernia repair by surgeons in training. Eur J Surg.1999; 165: 49-53.
15. Miedema BW, Ibrahim SM, Davis BD, Koivunen DG. A prospective trial of primary inguinal hernia repair by surgical trainees. Hernia 2004; 8 : 28-32.
16. Kehlet H, Bay-Nielsen M. Local anaesthesia as a risk factor for recurrence after groin hernia repair. Hernia. 2008;12:5079.
17. Kingsnorth AN, Britton BJ, Morris PJ. Recurrent inguinal hernia after local anaesthetic repair. Br J Surg. 1981;68:2735.
18. 13. Devlin HB, Gillen PH, Waxman BP, MacNay RA. Short stay surgery for inguinal hernia: experience of the Shouldice operation, 19701982. Br J Surg. 1986; 73:12324.
19. 14. Morris GE, Jarrett PEM. Recurrence rate following local anaesthetic day-case inguinal

hernia repair by junior surgeons in a district general hospital. Ann R Coll Surg Engl. 1987; 69 :979.
20. Robson AJ, Wallace CG, Sharma AK, Nixon SJ, Paterson-Brown S. Effects of training and supervision on recurrence rate after inguinal hernia repair. Br J Surg. 2004 ; 91:7747
21. Ball E, Sanjay P, Woodward A. Comparison of buffered and unbuffered local anaesthesia for inguinal hernia repair: a prospective study. Hernia. 2006;10:17578.
22. Poobalan AS, Bruce J, King PM. Chronic pain and quality of life following open inguinal hernia repair. Br J Surg. 2001;88:11226. doi: 10.1046.
23. Paajanen H, Scheinin T, Vironen J. Nationwide analysis of complications related to inguinal hernia surgery in Finland: a 5-year register study of 55 000 operations. Am J Surg. 2010;199:74651.
24. Lichtenstein IL, Shulman AG, Amid PK, Montllor MM. The tension-free hernioplasty. Am J Surg. 1989;157:188191.
25. Rutkow IM, Robbins AW. "tension-free" inguinal herniorraphy: A preliminary report on the "mesh plug" technique. Surgery. 1993;114:38.
26. Wantz GE. Experience with the tension-free hernioplasty for primary inguinal hernias in men. J Am Coll Surg. 1996;183:3516.

Original Article

Infrastructure, Inventory, Human Resource of Mother & Child Health Centers of Lahore and its Impact on Maternal Health Services

Malik Shahid Shaukat, Muhammad Naeem, Rabia Arshad Usmani and Muhammad Shahid Iqbal

Objectives: It is a common observation that there is load on tertiary care facilities which is logical outcome of under utilized primary level. For identification, quantification and gauging of these gaps current study was conducted at MCH Centers of City District Government Lahore.

Materials and Methods: It was cross-sectional descriptive study conducted at City District Government, Lahore. 18 MCH centers were selected by randomization technique at each town.

Results: The current study depicted that 44.44% centers were not having any telephone, fax, generator and ambulance service. While at 11.11% centers the post of dai are vacant. It was also found the 27.78% centers were not delivering service of IUD and inject able family planning services. It was also found that 88.89% of centers had the approved furniture, equipment and linen but in majority of cases it was non functional conditions. It was also found that 83.33% MCH Centers were lacking oxygen cylinder, artery forceps and tooth forceps. 88.89% MCH centers were not having vaginal retractors and dressing seizers. Umbilical Tape, Casco Vaginal Speculum, weighing machine were absent at 100% MCH centers. First aid box was present at 17 94.44% MCH Centers. Examination Couch, almirah, towel stand, iron bed and overalls were available at 88.89% of the MCH Centres but mostly they were in poor condition. Office chair, delivery couch, bed sheet and table cloth were available in all MCH Centres while bench, bucket, towel stand and durries were available in 94.44 MCH Centres.

Conclusion: The preceding lines depict that although majority of centers have got sanctioned equipment and furniture but they are non functional and due to this fact this chain of MCH Centers for Maternal Health Services are not delivering up to the mark. Investment in the form of financial resources determines the success or failure of any setup.

Keywords: LHV, LHWs, WMOs, MCHCs, Infrastructure, Impact.

Introduction

Women's health has long been a priority area of concern and activity for the United Nations development programme (UNDP). The WHO and UNICEF estimate that maternal mortality in developing countries is more than 100 times higher than in industrialized countries. Maternal component of MCH Services caters a large group, which is a special or risk group. The problem affecting the health of mother is multi factorial and is serious health concern of community and states in developing countries. The present strategies like Safe motherhood, clean delivery and EmOC is an integrated package of essential health care for mothers.

Materials and Methods

It was cross-sectional descriptive study conducted at City District Government, Lahore. Study Population was all MCH centers of City Distt: Govt. Lahore and a list of MCH centers located in the 9 towns of City Distt: Govt. Lahore. 18 out of 52 MCH centers working under the control of City Distt: Govt. Lahore, which constitute 33% of total facilities as calculated with help of statistician. 18 MCH centers were selected by randomization technique at each town.

Results

The current study depicted that 44.44% centers were not having any telephone, fax, generator and ambulance service. While at 11.11% centers the post of dai are vacant. It was also found the 27.78% centers were not delivering service of IUD and inject able family planning services. It was also found that 88.89% of centers had the approved furniture, equipment and linen but in majority of cases it was non functional conditions. It was also found that 83.33% MCH Centers were lacking oxygen cylinder, artery forceps and tooth forceps. 88.89% MCH centers were not having vaginal retractors and dressing seizers. Umbilical Tape, Casco Vaginal Speculum, weighing machine were absent at 100% MCH centers. First aid box was present at 17 94.44%

MCH Centers. Examination Couch, almirah, towel stand, iron bed and overalls were available at 88.89% of the MCH Centres but mostly they were in poor condition. Office chair, delivery couch, bed sheet and table cloth were available in all MCH Centres while bench, bucket, towel stand and durries were available in 94.44 MCH Centres. First aid box was present at 17 94.44% MCH Centers.

Table-1: Inventory of equipment available at MCH centres for maternal health services.

Equipment	Provision at MCH Centre n=18			
	Available		Not Available	
	No	Percentage	No	Percentage
Midwifery Kit	18	100	0	00.00
Family Planning Kit	18	100	0	00.00
Sphygmomanometer	16	88.89	2	11.11
Stethoscope	16	88.89	2	11.11
Fetoscope	18	100	0	00.00
Thermometer	16	88.89	2	11.11
Weighing machine	0	00.00	18	100
Examination Couch	16	88.89	2	11.11
Umbilical Tape	0	00.00	18	100
Height Measuring tape & stand	16	88.89	2	11.11
Strilizer	0	00.00	18	100
Torch	16	88.89	2	11.11
First aid box	17	94.44	1	5.56
Kindney tray	16	88.89	2	11.11
Vaginal speculum	0	00.00	18	100
Anterior wall vaginal retractor	02	11.11	16	11.11
Oxygen Cylinder	03	16.67	15	83.33
Curved dressing seizer	02	11.11	16	88.89
Straight dressing seizer	02	11.11	16	88.89
Curved artery forecps	03	16.67	15	83.33
Tooth forceps	03	16.67	15	83.33

Table-2: Inventory of furniture available at MCH centres.

Furniture item	Provision at MCH Centre n=18			
	Available		Not Available	
	No	Percentage	No	Percentage
Office Chair	18	100	0	00.00
Office Table	18	100	1	5.56
Examination couch	16	88.89	2	11.11
Delivery couch	18	100	0	00.00
Bed iron	18	88.89	2	11.11
Bucket	16	94.44	1	5.56

Almirah	17	88.89	2	11.11
Bench	16	94.44	1	5.56
Towel stand	18	88.89	2	11.11
Bed sheet	16	100	0	00.00
Pillow	17	88.89	2	11.11
Durries	16	94.44	1	5.56
Overalls	17	88.89	2	11.11
Table cloth	18	100	0	00.00
Baly cot	17	94.44	1	5.56

Table-3: Drug supply storage MCH centre.

Source / Storage	Status at MCH Centre n=18 Yes		No	
	No	Percentage	No	Percentage
Government				
Government	18	100	0	00.00
Non-Government	0	00.00	18	100
Storage of Medicine				
Dry place	17	94.44	1	5.56
Moist place	1	5.56	17	94.44
On the ground	1	56.56	17	94.44
Sunlight exposure	17	94.44	1	5.56

Table-4: Infrastructure details of MCH centers.

Infomation	Status at MCH Centre n=18 Yes		No	
	No	Percentage	No	Percentage
Description				
Rural location	2	11.11	16	88.89
Urban location	16	88.89	2	11.11
Building owned by government	18	100	0	00.00
Resources				
Electricity	18	100	-	00.00
Generator	0	00.00	0	00.00
Water supply	17	94.44	1	5.56
Latrine	0	00.00	0	00.00
Refrigerator	8	44.44	10	5.56
Ambulance	0	00.00	0	00.00
Telephone	0	00.00	0	00.00

Discussion

For identification, quantification and gauging of these gaps current study was conducted at MCH Centers of City District Government Lahore. Infrastructure, inventory of drugs and equipment and appropriate human resource is essential for success of Services Delivery Program. Punjab Devolved Social Sector Program observes that documents unearth that facilities at different level of health care are unable to deliver services that meets Minimum Service Delivery Standards, which is minimum level of services that patients and service users have a right to expect. There is lack of equipment, non availability of human resources and the poor condition of buildings. For geographical accessibility and services strengthing, the model efforts must be made which comply with Minimum Service Delivery Standards[1]. Health Sector Reform Program reflects that 22% of the sanctioned posts for the health workers in Punjab are vacant, 32% are vacant for WMOs, 37% of sanctioned posts for nurses are vacant, 59% sanctioned posts of gynecologists are vacant and 40% sanctioned posts of LHVs are vacant.

The overall quantitative in sufficiency of health reforms is aggravated by ineffective utilization of existing health workers resulting from mal distribution, faulty deployment and weak management[2]. The approved yardstick for maternal & child health centers reflect that one LHV, One Dai and one Naib Qasid are sanctioned posts. The documents also reflects that each center is having two LHWs of National programme for Family Planning & Primary Health Care for pay purpose, while administratively and technically they are under LHV in charge.

The preceding lines depict that although majority of centers have got sanctioned equipment and furniture but they are non functional and due to this fact this chain of MCH Centers for Maternal Health Services are not delivering up to the mark. Investment in the form of financial resources determines the success or failure of any setup. National Institute of Population Studies (NIPS) in its report depicts that spending on health and population through public and private sector is 4.1% of GDP in which public sector contribution is 0.57% in Pakistan.[3]

Financial literature reflects that 52 MCH centers of City District Government Lahore have total allocation to the tune of Rs: 8282828/-. This is yearly allocation and its non salary portion is to the tune of Rs: 1610617/- which is spent on contingency, billing and upgrading of these MCH centers. These figures further reflect that total non salary allocation of one MCH center is Rs: 30944/- per annum, out of which each center is left with only Rs: 18000/- on average per annum for up gradation and facilitation of patients of one MCH Center.[4]

The picture of financial status of MCH Centers reflects that only an amount of RS: 18000/- per anum is left for improvement of one MCH Center. This reflects the level of priority and seriousness of policy makers for this chain of maternal health which are suppose to deliver the services of preventive obstetrics and resultantly the 52 MCH Centers of City District Government Lahore are in deplorable condition.

Conclusions & Recommendations

The current study revealed that physical infrastructure of these MCH Centers are deplorable, the equipment/drug/furniture inventory is in adequate, capacity building of human resource was inefficient and visiting clients were dissatisfied with this chain of preventive obstetrics. This study focused on medical audit of these MCH Centers and evaluated their services and found major gaps in committed and standardized services prescribed for this chain. It is recommended that a separate yardstick of infrastructure and inventory of furniture /equipments should be notified for MCH Centers which is lacking in current mechanism on basis of these gaps following recommendations are submitted for concerned.

Acknowledgement:

I express my profound gratitude to Dr. Shaheena Manzoor, Prof. Dr. Farkhanda Kaukab & Prof. Dr. Rizwana Muzaffar) and sitting Dean of IPH (Prof. Dr. Yaqoob Qazi), the guidance where of proved asset for me as they inculcated in me not only the confidence to learn the subject of Public Health but also infused new ideas which, of course would proved a way for future dimensions.

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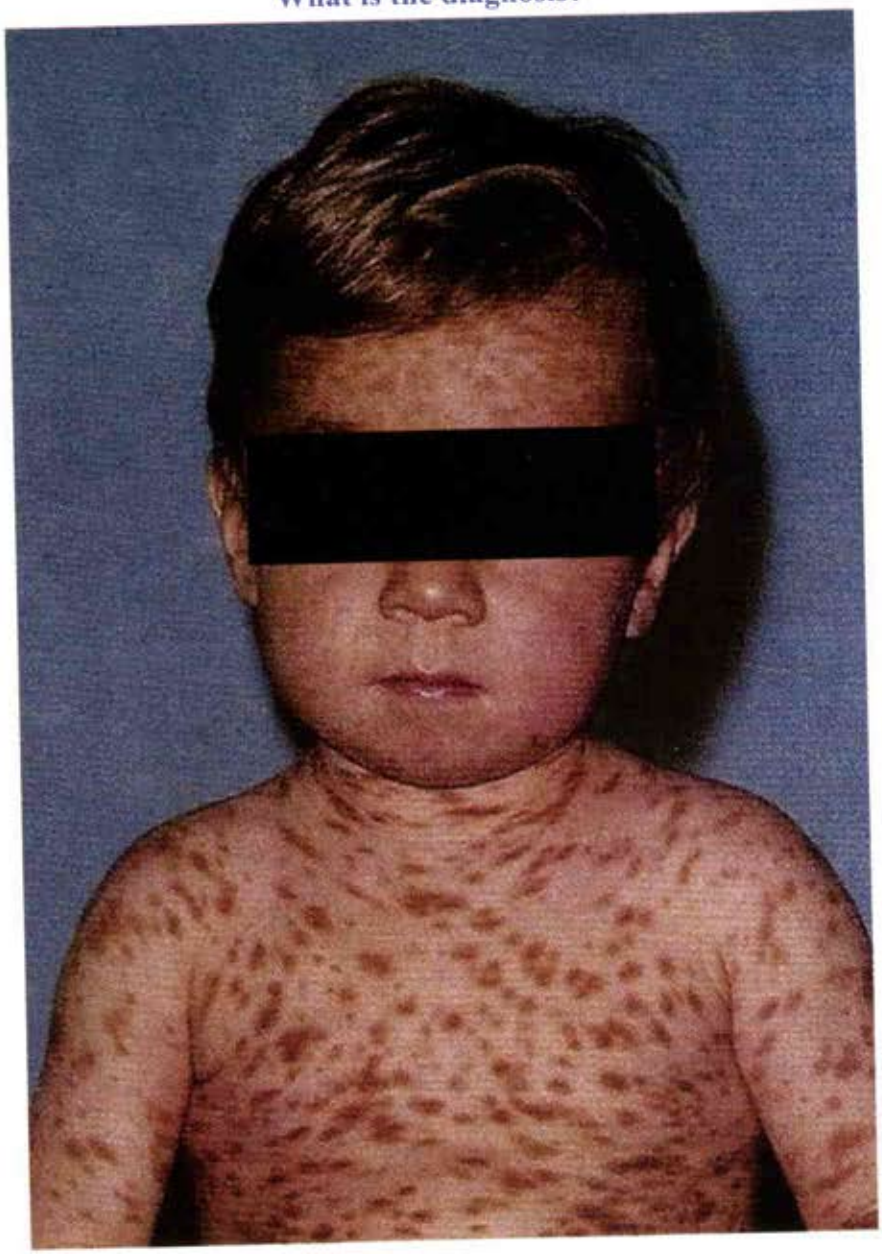
References

1. Government of Punjab Notification 2004. PDSSP, Minimum Service Delivery Standards, Government of the Punjab.
2. Government of Punjab Database 2008. Health Sector Reform Program (HSRP) database, Punjab 2008.
3. Government of Punjab Notification 2004. National Institute of Population studies (NIPS) 2008 Islamabad.
4. Government of Punjab. Budget Manual 2009-10 of City District Government Lahore. Development and non developmental allocation for mother and child health centers of Lahore.

Pictre Quiz

What is the diagnosis?



See answer page # 97

Original Article

A 5 Years Review of Maternal Mortality at FMH

Afshan Ambreen, Samina Khurshid, Ayesha Intasar, Misbah Khurshid and Khizra Anwar

Objective: To identify the main causes and associated factors contributing to maternal deaths. .
Material and Methods: The medical record of all the women dying in the department of obstetrics and gynecology were reviewed .Demographic records including age, parity, socioeconomic status and antenatal care were analyzed from the patient's records.
Results: There were 16 maternal deaths during the study period with the maternal mortality ratio MMR of 52.04/100,000 live births(16/30,741).The probable causes of deaths were ascertained on clinical assessment done jointly by gynaecologist,anesthetist and physician as postmortem examination was not done. The major causative factors were hemorrhage in 8(50%) patients, thromboembolism in 2(12.50%) septic shock in 2(12.50%) and acute pancreatitis in 1(6.25%).12/16 patients were unbooked and brought in emergency department. The ages of the women, who died ranged between 21-39 years. There were 5 primigravidas, 5 patients were Para 1-4, and 6 women had a parity more than 4.
Conclusion: Most of the maternal deaths can be prevented by providing skilled obstetrical care at the time of delivery, by emergency department and proper management of complications. Safe motherhood requires no costly technology but only appropriate setting of resources; we also need public awareness, raising the self determination and awareness of women rights and improvement of her role in decision making.
Key words: Maternal mortality, haemorrhage, pregnancy complications.

Introduction

According to the WHO, "A maternal death is defined as the death of a woman while pregnant or within 42days of termination of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from the accidental or incidental cause."[1] Globally every year an estimated 5, 29,000 maternal deaths are due to pregnancy related preventable causes e.g. hemorrhage, hypertensive disorders, sepsis, obstructed labour and unsafe abortions. The world figure of MMR was highest in Africa (830) followed by Asia (330) Oceania (240), Latin America and Caribbean (190) and developed countries.[2] According to the Planning commission estimate, MMR was 350/100,000 in 2000-01 and 400/100,000 in 2005.[3] Pakistan is one of the 191 countries that endorsed the united nations millennium development goals comprising of eight ambitious goals.The one of the health related goal is 75% reduction in MMR by 2015. [4]According to WHO and UNICEF the MMR of Pakistan is 340/100,000 live births .According to Pakistan demographic health survey report of 2006-07 the MMR was 371/100,000 live births in rural areas. [5] Pakistan is being ranked third among the developing countries as having highest maternal deaths. [6]

Material and Methods

The study was done in the Department of Obstetrics and Gynecology at Fatima Memorial Hospital, Lahore. It is and analysis of retrospective data. Records of deliveries conducted during the last five years (2007-2011) were studied. Demographic record including age, parity, socio-economic status and ante-natal care were analyzed. The socioeconomic status was divided into four categories according to monthly income (poor class i.e., less than Rupees (Rs) 3000 per month, lower middle class i-e., Rs10, 000-20,000 and high class i-e., more than Rs 20,000). Probable cause of death was made on clinical assessment done by Gynaecologist, Anaesthetist and Physician as postmortem examinations was not done.

Results

The numbers of deliveries carried out from January 2007 to December 2011 were 30,741. During this time period there were 16 maternal deaths and thus maternal mortality ratio calculated was 52.04/100,000. All 16 deaths were classified as Direct (death directly related to pregnancy) and compared with a previous study in FMH carried out between years 2001-2005.

with a previous study in FMH carried out between years 2001-2005.

Table-1: Maternal mortality ratio.

Result	2007-2011	2001-2005
Total number of deliveries	30,741	29,042
Total number of maternal deaths	16	17
MMR	52.04	58.53

Haemorrhage turned out to be the major cause of maternal mortality. Thromboembolism and septic shock were the second commonest Causes compared with causes of maternal mortality in study at FMH carried out between years 2001-2005.

The age of the women dying ranged between 21-39 years. Out of 16 dead women, 10 had a age range between 20-30 years (48.25/100,000%), 4 were between 31-35 years (61.43/100,000) and 2 were more than 35 years of age (159.10/100,000).

Table-2: Causes of maternal mortality ratio.

Causes	2001-2005 = n	2001-2005 % age	2007-2011 = n	2007-2011 % age
Haemorrhage	01	5.88	08	50.00
Thromboembolism	01	5.88	08	12.50
Septic shock	-	-	02	12.50
Fulminant hepatic failure and CLD	-	-	01	6.25
Hypertensive disorders of pregnancy	06	35.29	01	6.25
Eisermenger syndrome	-	-	01	6.25
Acute pancreatitis	-	-	-	6.25
Coagulation disorders due to IUD	02	11.76	-	6.25
Amniotic fluid embolism	02	11.76	-	-
Fatty liver of pregnancy	02	11.76	-	-
Anaesthesia complication	01	5.88	-	-
Puerperal myocarditis/peripartum CMP	01	5.88	-	-
Unknown	01	5.88	-	-

Table-3: Demographic and Obstetric profile of deceased mother (n=16).

Variables	No of Deliceries	No of Maternal Death	MMR-100,000
Age in years			**Age Specific**
< 20	2249	0	0
20-29	20724	10	48.25
31-35	6511	04	61.43
>35	1257	02	159.10
Parity			**Parity Specific**
Primigravida	7047	05	17.95
P 1-4	22180	05	22.54
> P4	1514	06	396.30-
Socioeconomic status			**Socioeconomic status specific**
High	6704	1	14.91

Upper middle	10596	3	28.31
Lower middle	7876	5	63.48
Low	5565	7	125.78

Discussion

Death of mother is a tragic event. In practical life it has a severe impact on the family, community and eventually the nation. The young surviving children left motherless are unable to cope with daily living and are at an increased rise of death.[7] Reduction of maternal mortality is an important MDG especially in low income countries, where one in 16 women dies of pregnancy related complications.[8] MMR Varies throughout different countries of the world. In sub Saharan Africa, MMR reported in 2000 was 1000/100,000 live births almost twice that of south Asia, four time higher than in Latin America and Caribbean and nearly fifty times higher than the industrialized countries.[9] The preliminary results of demographic and house hold survey 2007 reported the nationwide MMR of 276/100,000 live births. It is 320 in rural areas as compared to 177 in urban areas . The figures are 277 in the provinces of Punjab. While in Sindh, NWFP and Baluchistan it is 311, 272, and 765 respectively.[3] Women die because they have no access to skilled personnel during pregnancy and parturition and when an emergency arises they cannot reach a facility where emergency obstetrical services are available.[12]

The country with highest estimated number of maternal deaths is India (136,000) followed by Nigeria (37,000) and Pakistan (26,000).[10] Further, it is well recognized that maternal mortality number are often significantly underreported[11] While comparing MMR at different regions of Pakistan, it was observed that MMR at Abbotabad.[12] NWFP, was the highest (1270/100,000) followed by Quetta [13]Baluchistan 650/100,000 and Karachi[14] sindh (304/100,000). Haemorrhage followed by pre-eclampsia/eclampsia were the main causes of deaths observed in most of the studies carried out in Pakistan[12,13,15,16] According to Confidential Enquiries into maternal deaths in UK 2000, the MMR is 11.4/100,000 with thromboembolism being the major direct cause followed by hypertensive disorders and sepis.[20] In a survey done in United States, the MMR calculated was 12.6/100,000.[21] MMR in India is close to that of Pakistan being 259/100,000 with hypertension and hemorrhage as the main causes.[19,22] severe preeclampsia/eclampsia was the commonest cause of death among patients in Nigeria.[17] Causes of maternal deaths worldwide is haemorrhage 25% Hypertension 25% infection 15%, unsafe abortions 15% and indirect causes 20%.[18,19]

Maternal mortality ratio increases drastically with increasing age, parity and lack of antenatal care as found out in our study. The MMR among unbooked patients as compared to booked patients (339.7 /100,000) in a hospital at Nigeria was extremely high (23,121.4 per 100,000). It is seen that the percentage of women who seek antenatal care is extremely low. Each year 60 million women give birth with the help of untrained traditional birth attendant. The distance from health services, cost of transportation and drugs, multiple demands on women's time and lack of decision making power within the family are the major hindrances in seeking essential health services by our women and thus as few as 5% of women receive such care in poor countries and regions.[10]

Conclusion

The government and the Medical community place a very high emphasis on safe motherhood. However, MMR is alarmingly high as compared to the developed countries. It is still possible that MMR may be higher in rural settings than the estimates in this study. This situation can be rectified only by the efforts of the Health Authorities, the Medical Professionals and the Government acting in concert with one another. Population education is also essential.

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References

1. Lisa M Koonin, Hani K Atrash, Roger W Rochat, Jack C Smith. Maternal Mortality Surveillance, United States, 1980-85 MMWR 12/1/1988; 37 (SS-5): 19-29
2. World health organization maternal Mortality in 2000: Estimates developed by WHO, UNICEF and UNFPA (on time) 2009 (cited 2009 march 12). Available from URL: www.whoint2000
3. Pakistani's Millennium Develop

ment goals report 2006: goal 5 improves maternal health (earlier) 2009 (cited 2009 march 13) Available from URL: http://www.erprid.org/piublication/goals/wise2006/stat% 20 pages pdf.

4. Medal F, hosing N. Risk factors of maternal mortality in Pakistan: preliminary results from the demographic and health survey (DHS), 2006-2007 (online) 2009(Cited 2009 march 15) available from URL:http://paa2009princeton.edu/download aspen? Sub motional 90588
5. United millenum development goals (online) 2008 (cited 2009 march 13). Available from URl:http://www.un.org/millenieuimgoals/.
6. Women's health in Pakistan fact sheets prepared for Pakistan national forum on women's health WHO Non=vember 1997;14:3-5.
7. Mortising and evaluation (MAE) motional mortality in 2000. developed by WHO, UNICEF and / UNFPA available at www.who.inf/reproductivehealthpublication maternal mortality 2000. Assessed. On 28th October 2006.
8. Nisar ,N sohoo N.A maternal mortality in ural community a challenge for achieving millennium development goal J. Pak med Assoc. Jan 2010;60.
9. Safder s. Inam SNB, Omae A, Ahmed ST. Maternal Health care in rural area of Pakistan . J. Pak Med. Assoc. 2002;52:308-11.
10. Benagiano G, Thomas B; International federation of Gynecology and Obstetrics. Safe motherhood: the FIGO initiative. Int J. Gynaecol Aostet. 2003; 82 (3): 263-74.
11. Deneux-thraux D, Berg C, Bourier-Colle MH, Gissler M et. Al. undertaking of pregnancy-related mortality in the united states and Europe. Obstet Gynecol 2005; 106:648-92.
12. Begum S, Aziz-un-Nisa, Begum I. Analysis of maternal mortality in a tertiary care hospital to determine cases and preventable factors. J Ayub med coll Abbottabad. 2003; 15(2):49-52.
13. Sami Shehla, Baloch NS. Maternal mortality in Balochistan: A challenges for the Obstetricians. J Coll Physicians Surg Pak.2002;12:468-71
14. Qureshi RN, Jaleel S, Hamid R, Lakha SF. Maternal death in a developing Country a study ffrom Aga Khan University hospital, Karachi, Pakistan J Pak med Assoc. 2000; 51:109-11
15. Akber N, Shami N, Asif S. Maternal Mortality in a tertiary care teaching Hospital J Coll Physicians SUrg Pak. 2002; 12(17):429-31.
16. Jafarey SN. Maternal Mortality in Pakistan compilation of available data. J Pak med Assoc. 2002; 52:539-44.
17. Uzoigwe SA, John CT. Maternal Mortality in the university of port harcount teaching hospital, Port Harcourt in the last years before the new millennium. Niger J Med. 2004;13(1):32-5.
18. Khan K S. Wojdyl D, say L, Gulmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. Lancet.2006; 367: 1066-74
19. Ramanathan G, Arulkumaran S, Postparum hemorrhage. J Obset. Gynacol. Can 2006; 28(11):967-73.
20. Swiet de M. Maternal mortality: Confidential enquiries into maternal death in United Kingdom. Am J Obstet Gyneacol 2000; 182 :760-6
21. MacKay AP, Berg CJ, Duran C, Chang J, Rosenburg H. An assessment of Pregnancy related mortality in the United States. Paeditr Peritnat Epidemiol. 2005;19(3):
22. Gupta N, Kumar S, Sexena NC, Nandan D, Sexena BN. Maternal Mortality in seven districts of Uttar Pradesh-an ICMR task force study. Indian J Public Health. 2006; 50(3): 173-8.

Original Article

Impact of Various Factors on the Incidence of Congenital Abnormalities as Diagnosed on Antenatal Ultrasound Examination in Lady Willingdon Hospital (LWH)

Yahya Malik

Objective: To study the impact of various factors on the incidence of Congenital Abnormalities as diagnosed on antenatal ultrasound examination.

Material and Methods: 1794 congenitally abnormal fetuses were diagnosed on antenatal ultrasound examination in LWH during the period from 4th August 2004 to 31st December 2011.

Results: On average, 224 cases of congenitally abnormal fetuses were diagnosed per year. 1652 cases were recorded from the Lahore and adjoining districts mainly on the north side of Lahore. Maximum number of patients were around 25 years of age, were in their first year of marriage with an obstetrical history of gravida 1 and para 0. In 1020 cases consanguineous marriages were present.

Conclusion: Counseling regarding completion of family at an earlier age, cousin marriages, avoidance of certain environmental hazards, having serial antenatal ultrasound examinations and food and dietary supplementation may help to reduce the incidence of congenital abnormalities in a significant way.

Key words: Antenatal ultrasound, Congenital abnormalities and Affecting factors

Introduction

Every human being spends first 40 weeks of his or her life as intrauterine life. This life span can be divided into various parts like embryonic life (first 8 weeks) and fetal life (9-40 weeks)[1] For proper development to take place, this life period requires peaceful and harmless intrauterine environment.

Many conditions like environmental factors, exposure to some drugs and heavy metals, infections and genetic factors can interfere with this normal growth of human fetuses. This interference may result in structural deformities, defects in metabolic systems and chromosomal anomalies etc. Such defects may be grouped as congenital anomalies and they may be detected either before or after the birth. Spectrum of congenital anomalies may vary from curable conditions like hypospasdiasis to conditions like anencephaly which guarantee the demise of newborn.

Congenitally anomalous fetuses / newborns not only cause mental trauma to parents but usually also become a burden on their financial resources. Best way to deal with this problem is to detect them as early as possible preferably during intrauterine life. There are many ways to detect such fetuses and antenatal ultrasound examination being one of them [2,3]. Antenatal ultrasound examinations are easily available, are cheap and cost effective. If done serially during pregnancy, can detect major structural abnormalities with high degree of accuracy and confidence. The accuracy rate further increases if this examination is performed in a tertiary care hospital [4,5]

Present study was undertaken in the ultrasound department of LWH to determine the impact of various factors on the incidence of various congenital abnormalities seen in our population, to compare their frequency with other population groups, to examine the effects of some risk factors and to suggest some remedial measures which may help to reduce the rate of births complicated by abnormalities.

Materials and Methods

This study was performed in ultrasound department of LWH from 4th August 2004 to 31st December 2011.LWH is 235 bedded dedicated gynae & obs teaching hospital affiliated with King Edward Medical College, University, Lahore. On Average 28-30,000 patients are being examined in ultrasound department of this hospital per year. This number can roughly be divided equally between gynae & obs patients.

Every obstetrical patient coming to this department is subjected to routine obstetrical antenatal ultrasound

examination which includes determination of number of fetuses, biometry, evaluation of gestational age and evaluation of placenta and amount of liquor etc.

Every fetus with suspicion of having some congenital abnormality is subjected to detailed scrutiny. Every body system of such fetus is examined in detail. Each such fetus is examined in multiple sagittal and in at least six axial planes[6].Spine remains the special focus of interest in any fetus having neural tube defect and in such cases, as far as possible, each vertebra is examined in both sagittal and axial sections.

During the period of this study, each anomalous fetus was first examined by the author and then was examined by another colleague who was senior consultant radiologist. Compreh- ensive report was issued to every patient detailing the nature and the extent of abnormality (ies).

During this period, 1794 congenitally abnormal fetuses were diagnosed on antenatal ultrasound examination. Most of these pregnant ladies were having their first antenatal ultrasound examination in our department and in this study; they were recorded as OPD patients. A small percentage of patients was those who came to this department having an congenitally abnormal fetus diagnosed from somewhere else and they were also recorded as OPD patients. Still there was another small percentage of patients who were referred from in-patient departments. These were the patients in whom fetal abnormality had already been detected from outside scan and these patients were referred to department for confirmation of abnormality. These patients were recorded as in door patients.

As soon as an abnormal fetus was diagnosed, patient's data was recorded. That included date of examination, registration number, unit from which the patient was referred and the place of referral (OPD/Indoor). This record also included name and age of patient, as far as possible complete address of the patient and obstetrical history (duration of marriage, gravidity, parity). Exact relationship with husband (consanguinity), history of any abnormal fetus in any previous pregnancy and history of any abnormal fetus in near relatives especially in real sisters of bride was also recorded. For every abnormal fetus, at least one referral ultrasound image was obtained. A fetus with more than one abnormality or with multiple abnormalities was counted once only based on the primary / most conspicuous abnormality.[7]

During this study, no information was obtained from obstetrical data base, birth registers, congenital anomaly registers or post mortem reports etc. All these cases were examined in ultrasound department. Data was analyzed on software based on Microsoft Access System.

Results

On average, 224 congenitally abnormal fetuses were recorded per year. On monthly basis, more cases were observed in the months of June (183, 10.20%) and July (171 9.53%) than for the rest of months Although, conflicting reports about seasonal variations of various congenital abnormalities are available in literature (which may be influenced either by the presence of some teratogenic substance, absence of some vital nutrient from diet or increased incidence of some specific infection at a specific time of year), no such evidence was found in this study and all different types of congenital abnormalities noted were roughly evenly distributed throughout whole of the year.[8,9]

Table-1: Impact of various factors on the incidence of congenital abnormalities.

District	n &%
Lahore	945(52.68%)
Sheikhupura	425 (23.69%)
Gujranwala	119 (6.63%)
Narowal	93 (5.18%)
Kasur	54 (3.01%)
Nankana Sahib	44 (2.45%)
Sialkot	26 (1.45%)
Faisal Abad	19 (1.06%)
Others	69 (3.84%)
Age (Years)	
15-20	296 (16.49)
20-25	737 (41.08%)
26-30	516 (28.76%)
31-35	188 (10.47)
36-45	57 (3.17%)
Duration of Marriage (years)	
1	399 (22.24%)
2-5	645 (35.95)

6-10	441 (24.58%)
11-15	212 (11.81%)
16-20	75 (4.18%)
21-25	16 (0.89%)
26-40	6 (0.3%)
Gravida	
1	562 (31.33$)
2-5	1011 (56.35%)
6-10	216 (12.04%)
11-26	5 (0.27%)
Parity	
0	662 (35.90%)
1-5	1072 (59.75%)
6-9	60 (3.34%)
Relationship of bridegroom with bride	
Non relative	774 (43.14)
2nd Relative	103 (5.74)
1st cousin, son of maternal aunty (Khala ka beta)	265 (14.77)
1st cousin, son of paternal aunty (Phophi ka beta)	251 (13.99)
1st cousin, son of maternal uncle (Mamoon ka beta)	203 (11.32)
1st cousin, son of paternal uncle (Chacha ka beta)	100 (5.57)
1st cousin, son of paternal uncle (Taya ka beta)	98 (5.46)

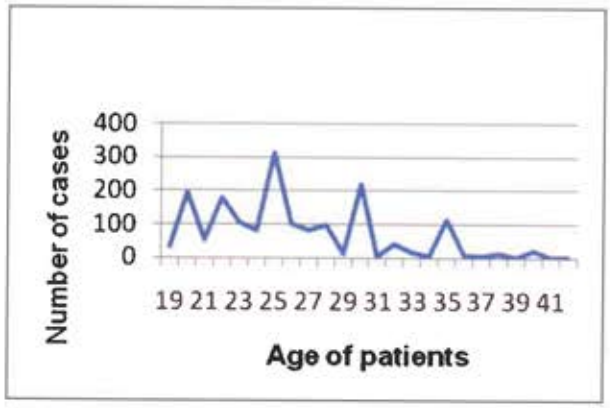

Fig-1: Relationship between age of patients and number of congenital abnormalities.

As far as geographical distribution is concerned, cases were mainly recorded from Punjab province. Occasionally, a few cases came from Sind, Khyber Pukhtunekhawa and a few cases were also recorded

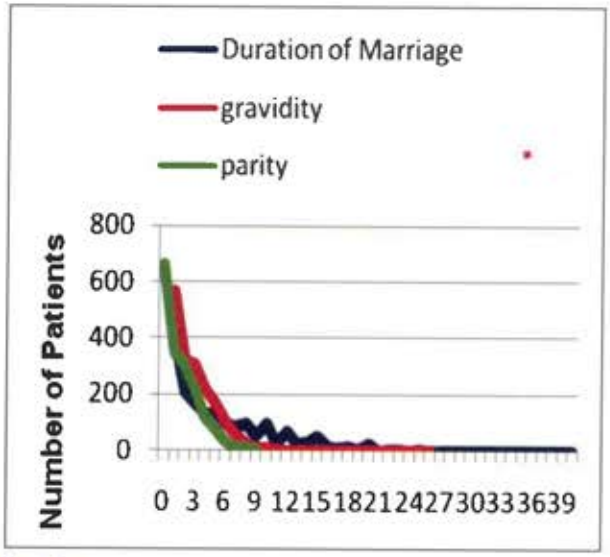

Fig-2: Combined effects of duration of marriage, gravidity and parity.

from Afghanistan. The maximum number of cases (945, 52.68%) came from Lahore. Next in line is Sheikhupura district, from where (425, 23.69%) cases were recorded. Remaining districts are mostly adjoining regions of Lahore. In this study, bulk of cases (1652, 90.57%) came from Lahore and north of Lahore (Sheikhupura, Gujranawala, Narowal, Nankana Sahib and Sialkot), and majority of abnormalities recorded involved central nervous system. The areas mentioned above are heavily industrialized and most of these industries are without proper disposal systems. They are disposing their waste water in open drains. These industries are also causing air pollution There is remote possibility that these industries might be polluting the underground water resources. Although, reports are available in the literature that the softness / hardness of water in some way can influence the rate of occurrence of some congenital abnormalities this possibility may be considered as an etiological factor in this area of Pakistan i.e. Lahore and immediate adjacent areas on the north side of Lahore [10-12]

As far as age wise distribution of cases is concerned, it varied from 15-45 years. Maximum numbers of women were 25 years of age (314, 17.50%). This figure coincides with another study in which average age of patients recorded was 25.12 when an abnormal fetus was detected in their pregnancies.[13] or when the age varied from 21-30 years[14]. Similar figures 27.3 years[2] and 27.5 years [15] were noted in other studies. In this study, next figure is 220 patients (12.26%) who were 30 years of age when an anomalous fetus was

detected. In this study, only 57(3.17%) patients were above 35 years of age.. This figure is much less than a previous study in which 11.6% patients were above 35 years of age when an anomalous fetus was detected in their pregnancies.[2] It is being increasingly suggested that the chances of congenital abnormalities are increased with increasing maternal age[16] especially those in which chromosomal anomalies are involved. This data also points out another very interesting trend in Pakistani ladies. Starting from 20 years of age, married ladies in our society suddenly become reproductively active after every five years and start getting pregnant, maximum number being at 25 years of age **(Figure-1).** In the in between periods, they probably observe family planning practice. Although, upward fluctuation in figure 1 at 40 years of age is very minimal, but it is definitely present.

As far as duration of marriage is concerned, maximum number of cases were recorded when the patient became pregnant with in first year of marriage (399,22.24%). However, they continue to get pregnant even at 40 years of age (1,0.06%) Considering the obstetrical history (gravidity and parity data), it is observed that the maximum chances of having a congenitally abnormal fetus is during first pregnancy gravida 1, (562 cases, 31.33%) and Para 0, (662 cases, 36.90%). These figures don't coincide with another study where these values were 2.08% and 1.85% respectively. **(Figure-2)** shows combined effects of duration of marriage, gravidity and parity. This figure suggest that the maximum chances of having an congenitally abnormal fetus are when a lady gets pregnant during first year of pregnancy with an obstetrical history of gravida 1 and para 0. The data also suggests that with each subsequent pregnancy chances of having a congenitally abnormal fetus reduce and every lady can relax to some extent once she has given birth to a normal infant.

As far as consanguinity (relationship of bride and bridegroom) is concerned, in 774 (43.14%) cases, both were non relative. In remaining 1020 (56.85%) cases, the patients were married to their cousins, details of which can be seen in table. Although, not examined in so much detail in previous studies conducted in Pakistan, comparison show correlation of consanguinity with congenital abnormalities in 18.2%[2], 79%[13], 44.7%[14], 42.14%,[17] 40%[18] and 55.5%[19] of cases. It has also been proposed that the consanguineous marriages (especially among first cousins), not only increase the risk of congenital abnormalities[16,20] they also by causing biological weaknesses, predispose a child at a relatively younger age to various types of illnesses. This had been suggested in a study in which 72.17% children admitted in hospital had parents who were first cousins.[21]

As far as history of congenitally abnormal fetuses in previous pregnancies is concerned, in 1728 (96.32%) cases, there was no history of congenitally abnormal fetuses in previous pregnancies. Only 66(3.4%) patients had a history of previous pregnancy complicated by an abnormal fetus. This figure is close to a previous evaluation in which 1.9% previous pregnancies were complicated by abnormal fetuses[20] and both these figures are much less than in another study in which history of previous pregnancies complicated by congenitally abnormal fetuses stood 8.8%.[2] Involvement of CNS heads the list with 45 cases (complicating previous pregnancies) and among them, hydrocephalus topping the list with 20 cases.

In this study, in 1738 cases, single fetus was present which was suffering from this problem. In 51 cases, twin pregnancies were present and in most of these cases, only one fetus was involved. In 5 cases, multiple fetuses are present.

History of congenitally abnormal fetuses in close relatives especially in real sisters of brides revealed that in only 8 cases, history of such complication was present.

Discussion

WHO defines birth defects or congenital anomalies as "structural, functional and / or biochemical-molecular defects present at birth whether detected at that time or not". Among different categories of congenital anomalies, congenital abnormalities i.e. structural and morphological defects represent the largest category. Congenital abnormalities can be classified as lethal, which cause still birth, infant death or result in termination of pregnancy once they have been diagnosed on antenatal ultrasound examination e.g. anencephaly. Severe congenital abnormalities are those, which if remain untreated would result in handicap / death, e.g. congenital pyloric stenosis. Mild congenital abnormalities are those which although require medical intervention, but life expectancy is good.[23] Lethal and severe congenital abnormalities, combined together are labeled as major congenital abnormalities. No matter how they are defined or how they are classified, major congenital abnormalities remain a dreadful thing.

Major etiological factors may include genetic factors. (may be responsible for 25% of total congenital

abnormalities). Two important risk factors may be held responsible in this regard i.e. getting pregnant after 35 years of age and high rate of consanguineous marriages.

Identifiable environmental etiological factors may include intrauterine infections including rubella, congenital syphilis, HIV/AIDS, maternal diseases like Diabetes Mellitus with high temperature, drugs like Thalidomide, Misoprostol, Antiepileptics[24] etc; exposure of expecting mothers to environmental pollutions, irradiation, alcohol[25], smoking, iodine deficiency, malnutrition and folic acid deficiency[26] .Such environmental factors may be responsible for 15% case of congenital abnormalities[23]

About 60% of congenital abnormalities are multifactorial in origin which are due to gene-environmental interaction. The idea that the environmental factors acting during mother's early life could predispose her to produce babies with neural tube defects later in her life is not new. Short or long lived, non specific interference with growth and early development of reproductive / endocrine system may contribute to later production of neural tube defects. Example may be the significant fall in the incidence of anencephaly which was observed after the start of dietary supplementation which was started in 1940 or when the use of mercury and calomel was abandoned in 1948.[27]

Third world or under developed countries including Pakistan are those countries where 80% of world population lives and 90% of total births occur. Almost all of these countries are facing problems like high fertility rate, low life expectancy, high maternal and infant mortality rates[27] It is being recommended by WHO that in all those countries where infant mortality rate has fallen below 40/1000, programs for prevention of birth defects must be implemented because at this stage congenital malformations start becoming one of the major contributing factors of infant mortality. The simple fact that the structural defects which constitute the bulk of congenital abnormalities in 3rd. world requires the necessity these countries adopt such preventive measures which should be of low cost and high impact, which can reduce the incidence of those structural congenital malformations and which can be detected either on antenatal ultrasound examination or at birth These simple methods may include expansion of rubella immunization, folic acid supplementation, improving maternal health and nutrition and counseling about proper family planning etc.

In countries with limited resources (like Pakistan) a few basic steps may be implemented as early as possible. These may include a vigorous campaign on electronic media and setting up of specialized 'congenital anomalies' counters in already existing out-patient departments especially in tertiary care hospitals like LWH. These counters should provide counseling regarding cousin marriages, completion of small family at an earlier age and methods to prevent and treatment of infections. These pregnant ladies must be convinced to have at least three antenatal ultrasound examinations during each pregnancy and first one of such examination must be at the end of first trimester or beginning of second trimester. Two of such examinations should be routine ultrasound examination and one should be specific to detect any anomaly

It had been suggested that simple folic acid supplementation can primarily prevent 26.6% congenital abnormalities[23] As the present study also suggests that major bulk of abnormalities involve CNS in one or another way, a readily available combination of folic acid / multivitamin should be supplied free of cost to all married women who are in their reproductive ages and who attend gynae / obs out-door department for any reason as most of the pregnancies in poor countries like Pakistan are unplanned[28,29,30] This simple step may one day prove to be giant leap on the road to reduce / eliminate the major bulk of congenital abnormalities. ions, irradiation, alcohol[25], smoking, iodine deficiency, malnutrition and folic acid deficiency[26] .Such environmental factors may be responsible for 15% case of congenital abnormalities[23]

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Conclusion

Counseling regarding completion of family at an earlier age, cousin marriages, avoidance of certain environmental hazards, having serial antenatal ultrasound examinations and food and dietary supplementation may help to reduce the incidence of congenital abnormalities in a significant way.

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References

1. Ultrasonography of the prenatal and neonatal brain. PP1. Timor Tritsch et al. 2nd edition. McGraw-Hill, Medical Publishing Division. ISBN 0-8385-8859-
2. The Accuracy of ultrasound in the diagnosis of congenital anomalies. Shama Munim et al. J.Pak Med Assoc. Jan 2006;56(1):PP16-18
3. Antenatal ultrasound screening for fetal abnormalities: a systematic review of studies of cost and cost effectiveness. Tracy Roberts et al. British Journal of Obstetrics and Gynaecology. January 2002,Vol109,PP44-56
4. First trimester ultrasonographic diagnosis of fetal structural abnormalities in a low risk population. Economides et al.BJOG,Vol105,Issue 1,January 1998,PP 53-57
5. Effectiveness of routine Ultrasonography in detecting fetal structural abnormalities in a low risk population. Lyn S Chitty et all.BMJ, 1991, November 9 303(6811) PP 1165-1169.
6. Sectional Fetal Anatomy in Ultrasound.Alf Staudach. Springer-Verlag. ISBN 3-540-18213-6. PP 32-33
7. Prevalence and secular trend of congenital anomalies in Glasgow UK. Stone DH et al. Arch Dis Child 2002,86,257-263
8. Seasonal Incidence of Anencephalus. Ian Leck et al. British Journal of preventive and social medicine(1966),20.67-75
9. A study of seasonal incidence of congenital malformations in the United States. Donald A.Wehrung et al. British Journal of preventive and social medicine(1970),24,24-32
10. Anencephalus and water hardness in South-West Lancashire. D.W.Fielding et al. British Journal of Preventive and Social medicine (1971),25,217-219
11. Malformations of Central Nervous System and Softness of Local water Supplies.C.R.Lowe et al. British Medical Journal, 1971,2,357-361
12. Prevalence of congenital malformations in Cross River and Ikwa Ibom staes of Nigeria from

1983-2003. Ekanem TB,et Al. Congenital Anomalies, 48,December 2008,PP 167-170.
13. Congenital Fetal Anomalies Antenatal Ultrasound Detection. Muhammad Nafees et al. Pakistan Armed Forces Medical Journal. 2006 Issue Number:3, September.
14. Frequency and Pattern of Distribution of Congenital anomalies in the newborn and associated maternal risk factors. Fauzia Perveen et al. J. Coll. Physicians and Surgeons Pak. Jun 2007;17(6):340-3
15. Antenatal Diagnosis, prevalence and outcome of major congenital anomalies in Saudi Arabia-A hospital based study. Sallout et al. Ann.Saudi Med 2008, Jul-Aug (28) 4. PP 272-276
16. Congenital Malformations in Assam. Hemonta KR Dutta et al. Journal of Indian assoc. of pediatric Surgeons.2010,Vol 15,Issue 2,PP 53-55.
17. Congenital malformations and consanguinity. Shami et al. Pakistan Armed Forces medical Journal. 1997,47.PP70-72
18. Frequency of consanguinity and its effects on congenital malformations. A Hospital based study. J. Pakistan Medical Association1997, 47 PP 75-78.
19. Prevalence of Gross Congenital Malformations at birth in the neonates in a tertiary care hospital. Waqas Jehangir et al. APMC, Vol. 3, No 1, Jan-Jun 2009, 47.
20. The prevalence of congenital malformations and its correlation with consanguineous marriages. Naeimeh Tayebi et al. Oman medical Journal 2010, Jan 25 (1), PP 37-40.
21. How frequent are consanguineous marriages. Akram DS.et al. J DUHS, 2008, Vol.2 (2), PP 76-79.
22. Diagnostic Ultrasound applied to obstetrics and Gynaecology. Rudy E. Sabbagha. 3rd. Edition. J.B. Lippincott company. PP.373.
23. Birth defects are preventable. Czeizel AE. Int. Journal of Med. Sci. 2005, 2(3), PP 91-92.
24. Antiepileptic Drug Use in women with Epilepsy and Congenital malformations in offspring. Artama M et al.Neurology,2005 Jun.14;64(11) PP 1874-1878.
25. Microcephaly, an epidemiological study. Melissa J Krauss et al.
26. Prevention of Congenital anomalies in Developing Countries.Penchaszadeh B Victor. Community genetics 2002; 5: PP 61-69.
27. Neural Tube Defects, maternal cohorts and age, a pointer to etiology. JP, Bound. Archives of Disease in childhood.1991-66. PP 1223-1226.
28. Decline in the Incidence of neural tube defects after the national Fortification of Flour(1997-2005).Safdar OY et al. Saudi Medical Journal, 2007,Aug.28(8). PP1227-1229.
29. Periconceptional supplementation with Folic Acid for the Primary Preventation of Congenital malformations. Ronfani L et al. Pediatr Med. Chir 2004 Mar-Apr 26(2):105-111.
30. Neural Tube Defects: pathogenesis and Folate metabolism. Pulikkunnel ST et al. J. Association Physician India 2005 Feb. 53 PP 127-3

Original Article

A Case Study of Multidimensionality of Organizational Culture

Junaid Sarfraz Khan, Tahira Bano, Osama Mukhtar and Saima Tabasum

Objective: The right kind of institutional culture enhances its effectiveness that ultimately leads towards achieving its missions, objectives and goals.

Methods: This case-study was conducted in the University of Health Sciences, Lahore to identify the Institutional Culture in the University. Academic Culture Inventory (ACI) and Values Survey Module (VSM) 08 were used as survey questionnaires. Fifty ACI questioners were distributed among grade 16 - 20 officials, 10 in each grade. Hundred VSM 08 Questionnaires were distributed among the garde 1-15 employees. Ten questionnaires from each category and fifty six VSM 08 questionnaires were retuned and institutional culture was identified. Responses and behaviors of the people on different social and job situations were determined on the findings of VSM 08 through Chi-Square Test. Microsoft Excel and Statistical Package for Social Sciences (SPSS) were used to generate the results. A p-value of = 0.05 was considered as statistically significant.

Results: Developmental Culture' and 'Virtual Culture' were identified as the strongest institutional cultures by the higher and lower grade officials respectively. 'Tangible Culture' was identified as the weakest institutional culture in both cases. In the VSM 08 questionnaires, the response rate was 56%. Various demographic variations within the culture were identified based on the VSM 08 questionnaire survey.

Conclusion: Communication gap between the Higher-grade officials and lower-grade employees should be bridged by holding various meetings, conferences and seminars where the lower-grade staff gets the opportunity to interact with their officers and share their own ideas about the policies and strategies of their institutes.

Results: Organizational Culture, UHS.

Introduction

The University was established under the University of Health Sciences Lahore Ordinance, 2002 (LVIII of 2002)[1].

Legal Status:

It is a public sector university recognized by the Higher Education Commission of Pakistan (HEC), Pakistan Medical and Dental Council (PMDC) and is included in the Directory of the World Health Organization (WHO).

Jurisdiction:

The University exercises its powers conferred on it by or under its Ordinance within the territorial limits of the Province of the Punjab. Its Section 37 reads:

"All medical institutions, whether in public or private sector, located within the geographical boundaries of the Province of the Punjab, whether affiliated with any other university, examination board or a medical faculty, notwithstanding anything contained in any other law for the time being in force, shall affiliate with the University within such period and on such terms and conditions, as may be prescribed".[1]

Statutory Role:

The primary role of the university, as specified in the Ordinance 2002[1], includes provision of instruction and dissemination of knowledge, advancement of research, prescription of courses of studies, holding of examination, award of degrees, diplomas, certificates and other destinations, establishment of institutes, colleges, centers of learning for the development of teaching and research.

UHS at a Glance

Campuses: Two (Lahore Campus and Kala Shah Kaku Campus)

Constituent College: Gujranwala Medical College, Gujranwala

Attached Teaching Hospital:
DHQ.

Institutes: Three (Institute of Allied Health Sciences, Postgraduate Institute of Nursing, Institute of Learning Emergency Medicine)

Faculties: 17 (Including Anatomy, Physiology and Biochemistry, Forensic Medicine & Toxicology, Pharmacology & Therapeutic, Pathology & Allied subject, Community Medicine & Public Health, Internal Medicine & Allied Subjects, Ophthalmology, ENT, Surgery & Allied Subjects, Gynecology & Obstetrics, Dentistry & Allied Subjects, Nursing, Paramedical & Allied Health Sciences, Healthcare &

Hospital Management, Pharmacology, and Behavioural Sciences)
Departments: 13
Programmes: Postgraduate: 71, Undergraduate: 25
Affiliated Institutes: 71
Accredited Institutes: 14
Registered Students: 39,562
Library Collection: Books (Prints) 1475
Books (Electronic) 40,000
Journals (Print) 31
Journals (Electronic) 26,000
Theses -900
Number of Examination conducted every year (Average): 216
Number of Candidates examined every year (Average): 28,377
Annual budget: Rs. 306.190 Million
Research Budget: 10 Percent of the total
Staff: 343 (at UHS Main Campus)

Positivist Research and Organization Culture:

The positivist research on an organizational culture shows us that the type of prevalent culture in any organization affects the functioning of the organization including efficiency, student retention, employee turnover, job satisfaction, attainment of goals etc.[2] Existence of a strong organizational culture is therefore associated with higher level of organizational effectiveness. Organizational effectiv- eness is related to the extent at which the organization is successful in completing its mission. A strong organizational culture exists when the majority of its members share a common set of core values.[3] However, the members of the organization have to continuously adapt to both internal and external factors influencing their organization while maintaining a consistency in their core values. Failure to adapt and to respond in accordance with their core values that define the culture of the organization may result in changes in the organizational structure based on variations in internal and/or external forces. The environment hardly ever remains stable but the hallmark of a seasoned organization is to weather the changes and maintain their culture. However, another viewpoint again derived from the positivist research maintains that the organizations that exhibit flexibility in their culture based on internal and external environmental variations are more likely to be effective.[4] Nevertheless, effective organizational culture is only one of the many factors affecting organizational performance including organizational design etc.

Cultural Topologies in Higher Education:

There are a number of cultural models that have been presented by researchers in higher education. A brief summary of each is provided below:

1.Collegial

This model is characterized by a non-hierarchical relationship and a culture that is based on sharing of power with considerable interaction amongst staff and collaborative decision-making processes through consensus.[5]

2. Managerial

This model is also called a bureaucratic cultural model with adherence to formal rules in order to improve efficiency. Decision-making follows a certain hierarchical pattern with reporting relationships and clear demarcations between responsibilities, accountabilities and decision-making.6

3. Developmental

This model promotes human growth and professional development through ongoing learning for all. This allows for critical thinking and practice through critical analysis. Organizations with a predominantly developmental culture experience rapid growth and are efficient because they exhibit flexibility through a process of self-learning and adaptation.

4. Adhocracy

In this model, decisions are made on ad hoc basis. In this type of culture the organization is very responsive to changes in internal and external stimuli. This allows for flexibility as the organization reflects the larger needs of the community and follows its trends.[7]

5. Market

This culture exists in organizations that seek competitive advantages over their rivals placing a high priority on satisfaction of their clients and approaching environmental change through market analysis. These organizations follow productivity oriented trends.[7]

6. Anarchical

In anarchical organizations, goals are vague and are in conflict with each other. Technology may be difficult to understand but participation in organizational decision-making is very fluid with different individuals making different decisions for different situations at different times.

7.Tangible

Denison (1990)[8] describes artifacts as the tangible aspect of culture shared by members of an organization. Artifacts include facilities, offices, furnishings, slogans, mission statements, how individuals within the organization interact with each other and with the outside world visibly, dress codes,

organizational culture at the most cursory and superficial level where mundane rituals and pomp and show may dictate the cultural setting and working of an organization.

7. Virtual

A virtual organizational culture is built on trust, leadership, awards, flexibility of working hours, sense of responsibility to accomplishing tasks and shared values. The employees do not occupy the same physical space and are scattered, though they may occupy the same virtual space and work towards a common goal. Guidelines and explicit instructions play an important role in providing a direction to the activities of all the employees.

Cultural Direction:

The orientations of organizational culture are provided in **table 2** and organization's culture can be either largely internally focused or externally directed. Cultures like 'collegial' and 'managerial' that are internally focused, have their primary value orientations directed towards their employees and other groups within the organization. Whereas, cultures like 'adhocracy' and 'market' are externally focused and in tune with the changes and requirements of the external players like the public, the consumers and other external stakeholders including the government and the international market. Some cultures value flexibility whereas others are orientated towards stability.. Where organizations are having difficulty with external forces like finding resources, for example, they seek to develop a more externally orientated culture while organizations experiencing problems with internal factors like integration and trust, seek to develop a more internally focused culture. In practice this is easier said than done. Any attempt to change an organization's culture can lead the existing culture in any one of multiple directions and may not have the desired effect. The culture of an organization especially an academic institution is unique to the institution and is the result of both internal and external forces that helped define it over many years. Changing it, especially in large academic organizations, requires considerable effort through politics, training and administrative policy changes.

Table-1: Orientations of organizational culture.

	Internal Focus	External Focus
Flexibility	1- Collegical	1- Adhocracy
	2- Development	2- Anarchical
	3- Virtal	
Stability	1- Managerial tangible	1- Market

Methods

This case-study was conducted in the University of Health Sciences, Lahore to identify the Institutional Culture in the University in 2011. Academic Culture Inventory (ACI)10 and VSM 0811 (Values Survey Module) were used as a data collection tool. Fifty ACI questionnaires and hundred VSM 08 questionnaires were distributed amongst the higher-grade officials (grade 16 to grade 20) as well as among the lower-grade employees (grade 1 to grade 15) of the University. Ten ACI questionnaires from each category and fifty six VSM 08 Questionnaires were received back. On the basis of the perception of the higher-grade officials and lower-grade employees in the inventories, the institutional culture was identified. The responses and behaviors of the people on different social and job related issues were determined through the responses received in the VSM 08 survey. Two procedures were adapted to identify the institutional culture of the University. Firstly, the perception of each participant was marked according to the marking key for the ACI12. Secondly, average for each response was calculated and then sorted out according to the marking key.

Perception differences between the higher-grade officials and lower-grade employees regarding the institutional culture were determined by both the procedures mentioned above. Association between demographic variables and the perceptions in the VSM 08 questionnaire survey was determined through Chi-Square Test. Microsoft Excel and Statistical Package for Social Sciences (SPSS) were used to generate the results. A p-value of $= 0.05$ was considered as statistically significant.

Results

In the Study, 'Developmental Culture' was identified as the strongest institutional culture in the University by the higher-grade officials. 'Developmental Culture' ranked "First" 7 times out of ten while 'Collegial Culture' and 'Adhocracy Culture' ranked "First" 2 and 1 times respectively. In the case of lower-grade employees, 'Virtual Culture' was identified as the strongest institutional culture of the University. Five inventories ranked the 'Virtual Culture' as "First". Here 'Developmental Culture' ranked "First" in 3 inventories and 'Collegial Culture' and 'Tangible Culture' both scored "First" in one inventory each. Percentages for strongest institutional cultures are shown in **Fig. 1.**

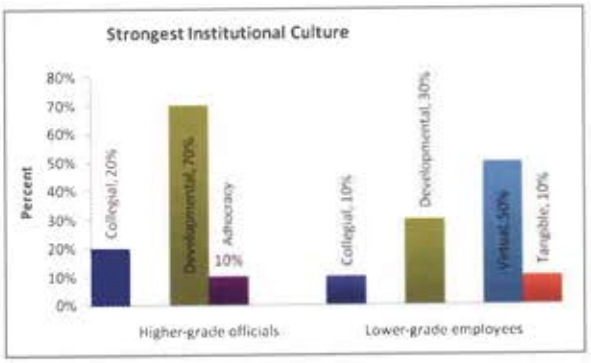

Fig-1: Strongest Institutional Cultur.

'Tangible Culture' was identified as the weakest institutional culture in both cases. Higher-grade officials inventories scored 'Tangible Culture' as "Least" 7 times out of ten and 'Adhocracy Culture' 3 times.

In the lower-grade employee inventories, 'Tangible Culture' scored "Least" five times out of ten. 'Adhocracy Culture' and 'Managerial Culture' scored as "Least" 2 times each and 'Collegial Culture' Scored as "Least" in a single inventory. Results are shown in **Fig. 2.**

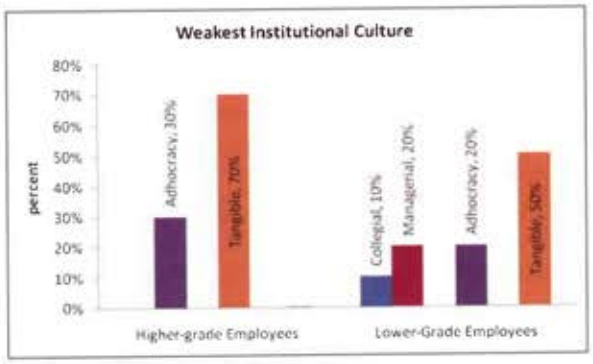

Fig-2: Weakest Institutional Culture.

In the second procedure, average of the responses for each statement was calculated and they were sorted out for each culture. In this process again 'Developmental Culture' was identified as the strongest institutional culture by the higher-grade officials and 'Tangible Culture' as the weakest institutional culture in the University. But according to the lower-grade employees' views, 'Virtual Culture' was identified as the strongest institutional culture and 'Tangible Culture' as the weakest institutional culture in the University. Results are shown in **Fig. 3.**

In the VSM 08 questionnaires, the response rate was 56%. Various demographic variations within the culture were identified based on the VSM 08 questionnaire survey. Statistically, females showed more concern than males to 'live in the desirable area' and 'to avoid two bosses at any cost in an organization' ($p \leq 0.05$). Majority of the females save money to buy something expensive while males borrow to buy it ($p \leq 0.05$).

For the age variable, the younger age-group participants i.e. 20 to 34 years paid utmost importance' to getting recognition of good performance' and 'security of the employment' ($p \leq 0.05$). Participants from higher education group paid utmost importance 'to having sufficient time for their personal life' ($p \leq 0.05$). This may be due to the reason that this group suffers the most in giving time to their family/personal life. The participants from lower education group showed more concern than the other education groups towards having job security and chances of promotion ($p \leq 0.05$).

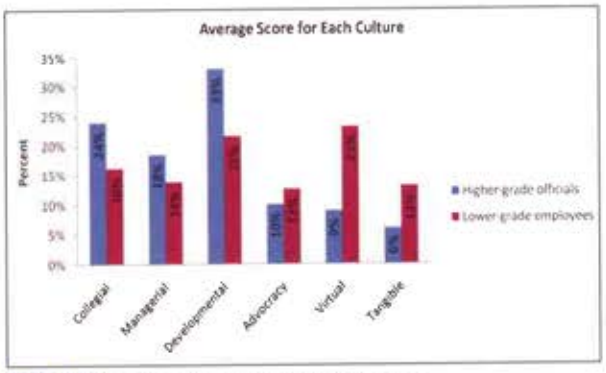

Fig-3: Average Score for Each Score.

Discussion

An organizational/institutional culture is most often discussed according to introversion-extroversion of policy focus and flexibility control of its structure.[13] Each and every member, in an institution, contributes towards their existing culture or in developing their institutional culture and their level of contribution determines its efficiency and effectiveness.[14,15] In our study, developmental culture was identified as the strongest culture by the higher-grade officials. In an institute, especially in the higher educational institutes, Higher-grade officials are always competent educated fellow possessing various professional skills and fully involved in major institutional issues related to the policy making , decision-making and responsible to set the key standards for their institutes to achieve the long term and the short term goals and objectives.[16] Their level of education, exposure and skills strengthen their critical thinking and they come with some definite

creative and challenging ideas that can benefit their institutes in many ways to make them competitive in a rapidly changing marketplace.[17] Thus, it should not come as a surprise that they have high opinions about the developmental culture due to its versatility, usability and flexibility towards achieving the goals of their institutes.[18]

On the other hand, lower-grade employees ranked 'virtual culture' as the strongest institutional culture. Majority of the lower-grade officers are comparatively less educated and financially burdened individuals who have to work in a controlled environment. The majority of them are involved in manual/physical work with little opportunity to use or develop critical thinking as they are usually assigned monotonous exercises. To them, only guidelines and explicit instructions play an important role in providing a direction to their activities. Therefore, they considered, our study, 'virtual culture' as a conducive institutional culture. Similar findings have been reported in other studies.[19] The weakest culture for both higher-grade officials and lower-grade officers was 'tangible culture', a stability-oriented culture, where superficiality and pomp and show determine the level of an employee and helps exhibit the mission of the institution.

Another interesting aspect of the study was observed in the form of gender discrimination through the VSM 08 questionnaires. The response rate was 56%. Firstly, females showed more concern than males to live in 'desirable areas'. Females naturally want to work in a secure and safe environment while males may not be bothered about that too much. In Pakistan, especially, the ratio of working women is very low because the majority of people are of the view that the real responsibility of women is to manage household work only. In this male-dominant society, when a female, after facing many problems, joins an institution, her first priority would definitely be a secure and sound environment where she can work safely. It has been observed that the females from well reputed institutes show better performance and bring credit to their institutes because they work there with comfort and ease. Other studies have also revealed the fact that women are often better employees than male workers. They have greater capacity to work in competitive, challenging situations. The difference lies in the fact that women want competitive situations in a safe and secure environment.[20,21] Secondly, females would like to 'avoid two bosses at any cost in an organization'. Females are often more responsible and diligent workers than males[22] and two bosses at the same institute may affect their performance as their point of views may vary and contradict each other. This would ultimately disturb the official environment and females may not feel at ease while working in such a climate.

The younger group participants showed a high tendency towards: i) 'getting recognition of good performance in the form of motivation and feedback', and ii) 'security of the employment'; although both factors go side by side directly or indirectly. Younger generation is more enthusiastic and energetic about the nature of their work. They are mostly overpowered by the feeling of self-assertion, and positive feedback, in the form of recognition of their performance which brings comfort and satisfaction to them and consequently, affects their future performance in a more positive way.[22] Moreover, in our society, the ratio of unemployment is very high and the young professionals, who get desirable jobs after a long and hard struggle, are very conscious about the security of their employment. Another difference between the ideas of higher-grade officials and lower-grade officers is seen in their responses regarding their priorities or interests. Higher-grade officials group gave importance 'to having sufficient time for their personal life'. This may be due to the reason that they are highly educated people who mostly spend their time in studies and other research work so that this group suffers the most in giving time to their family/personal life. On the other hand, lower-grade employees group was mostly concerned with job security and chances of promotion. The reason may be their financial background. In our society, majority of the lower-grade employees live a hand-to-mouth life. There is little chance of improvement in their living standards. Mostly, they spend their life doing monotonous work with least chances of promotion. To meet the requirements of their families, they can not get higher education and start their practical life before getting any higher degree. Institutional instability is yet another cause. In most of our institutions, there are a few policies only if any, that protect the rights of lower-grade staff and they are rarely provided required facilities. Therefore, they remain busy in struggling for a little better future.

Conclusions

The right kind of institutional culture enhances its effectiveness that ultimately leads towards achieving its missions, objectives and goals. This would be possible only if there is flexibility and intervention in

possible only if there is flexibility and intervention in the working environment for all employees. There should be openness and harmony in an institute where all workers especially lower-grade employees are provided maximum opportunities to improve their innovative skills. They must be involved in creative activities. Communication gap between the higher-grade officials and lower-grade employees should be bridged by holding various meetings, conferences and seminars where the lower-grade staff gets the opportunity to interact with their officers and share their own ideas about the policies and strategies of their institutes. They would definitely perform well when they feel their opinions are valued. Similarly, economic instability of the lower-grade employees needs to be addressed because it affects their performance directly or indirectly. Female workers must be provided a conducive working environment, so that, they can work with full potential to develop their institutional culture. Younger staff must be involved in various creative or innovative activities as they have full potential and energy to do that. The workers of any organization can prove their worth and work with trust, less conflicts and greater morale only, if they are provided with a desired congenial environment with full assurance of job security.

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References

1. Government of the Punjab; Law and Parliamentary Affairs Department, Notification 2002, September, 28th (The Punjab Gazetter); Ordinance 2002, University of Health Sciences, Lahore.
2. Hodgetts, Luthans F. International Management: Culture, Strategy, and Behavior, 5th Ed. New York, McGraw-Hill/Irwin; 2003.
3. Kathryn BA. Organizational Culture. [Internet] 2002. [cited 2012 June 6] Available from: http://www.au.af..mil/au/awc/awcgate/doe/benchmark/qq-organizationalculture.PDF
4. Schein EH. On Dialogue, Culture, and Organizational Learning. Reflect. 4(4); 27-38.
5. Berquist WH. The Four Cultures of the Academy. Essays on Teach. Excell. 1992-93: 4(8).
6. Năstase M. Understanding the Managerial Culture. Rev. of Intl Comp Mangt. 2009 May; 10(2).
7. Tharp BM. Four Organizational Culture types; Haworth organizational culture White Paper. [Internet] 2009. [cited 2012 June 6] Available from: http://www.Haworth-europe.com/en/content/download/30883/1230768/file/white-paper_Four-Organizational-Culture-Types.pdf
8. Denison DR. Corporate Culture and Organizational Effectiveness. 1990. New York: John Wiley & Sons.
9. Julia C, Valencia N, Valle RS, Jiménez DJ. Organizational culture as determinant of product innovation. Europ J of Inno Mangt. 2010; 13(4):466 480.
10. Bergquist WH, Pawlak K. Engaging the six cultures of the academy. San Fransisco: John Wiley & Sons; 2008, Appendix I; p. 251-256.
11. VSM 08: Values Survey Module 2008 Questionnaire, English language version. 2008 ; Geert Hofstede BV. [Internet] 2010. [Cited 2012 May 6]. Available from: www.geerthofstede.-com/media/253/VSM08English.doc
12. Bergquist WH, Pawlak K. Engaging the six cultures of the academy. San Fransisco: John Wiley & Sons; 2008, Appendix II; p. 257-260.
13. Cameron KS. Culture congruence strength and type relationships to effective. Working paper. Business School, University of Michigan. 1985.
14. Hsu Nan-Hsiung. Organization theory and management, Taipei: Tsang Hai Book Publishing Company; 2010.
15. Drucker PF. The effective executive [Internet].1966 [cited 2012 June 6]. Available from: http://www.gurteen.com/gurteen/gurteen.nsf/id/X0003C29A/
16. Heap N. Practical Developmental Ideas. [Internet] 2004. [Cited 2012 June 6]. Available from: http://www.nickheap.co.uk/
17. Simonsen & Peggy. Promoting a Development Culture in Your Organization: Using Career Development as a Change Agent. Consulting Psychologists Press: Palo Alto. 1997.
18. Denison DR, Spreitzer GM. Organizational culture and organizational development. Res in Org Change and Dev. 1991; 5:1-21.
19. Jackson C, Lalioti V. Virtual Cultural Identities. South African Human-Computer Interaction Conference. University of Pretoria Conference; Hatfileld, South; 2000.
20. Terris Worldwide. Gender Roles and Organizational Behavior. [Internet] 2009 [Cited 2012 June 6]. Available from: http://www.consultant-for-businessexcellence.com /gen- der-roles.html
21. Dowling C. A Hostile Work Environment for Women at the Top. [Internet] 2010. [Cited

2012 June 6]. Available from: Http://www.womens-wellbeing-and-mental-health.com/hostile-work-environment.html
22. Plack A. Are women more responsible than men? [Internet]. 2010 [Cited 2012 June 6]. Available from:http://www.3cordcrew.com/2010/12/03/are-women-more-responsible/
23. Kivel P. Social Service or Social Change? Who Benefits from your Work. [Internet]. 2000 [Cited 2012 June 6]. Available from:http://www.socialworkgatherings.com/Social%20Services%20or%20Social%20Chang.pdf

Answer Picture Quiz

Darier's sign is a change observed after stroking the skin of a person with systemic mastocytosis or urticaria pigmentosa.
In general, the skin becomes swollen, itchy and red. This is a result of compression of mast cells, which are hyperactive in these diseases. These mast cells release inflammatory granules which contain histamine. It is the histamine which is responsible for the response seen after rubbing the skin.

Original Article

Serum Magnesium Levels in Type 2 Diabetic Patients presenting with Acute Coronary Syndrome and Prevalence of Cardiac Arrhythmias in these Patients

M. Raheel Anjum, Fareeha Sheikh, Aun Raza, Raza-ul-Haq, M Imran and Aziz-ur-Rehman

Objective: Hypomagnesaemia have been reported to occur with an increased frequency in type 2 diabetics compared with their counterparts without diabetes. Abnormalities of magnesium levels, such as hypomagnesaemia, can result in disturbances in nearly every organ system and can cause potentially fatal complications (e.g., ventricular arrhythmia, coronary artery vasospasm, sudden death). Premature ventricular complexes (PVC) predict cardiovascular mortality among several adult populations. This study was done to find correlation between serum magnesium levels of diabetics and incidence of arrhythmias.

Methods: We analyzed the serum magnesium levels in fifty consecutive patients with type 2 diabetes presenting with acute coronary syndrome in CCU of Services Hospital, Lahore and prevalence of cardiac arrhythmias in these patients. Serum magnesium levels were measured at presentation and twenty four hour Holter monitoring was done for the detection of arrhythmias.

Results: There were 33 male (66%); 17 female (34%) patients and mean age of presentation was 60 years (± 20 years). 7 (14%) out of 50 patients had hypomagnesaemia (<1.7mg/dl), 2 females and 5 males. 'Ventricular premature contractions' in hypomagnesemic patients were 1.5 times the patients with normal magnesium level. There was no definite relationship observed between serum magnesium level and 'supraventricular premature contractions'.

Conclusion: Although ventricular premature contractions are more common in patients with hypomagnesaemia and may result into life threatening arrhythmias but no life threatening arrhythmias (e.g., ventricular tachycardia and torsade de pointes) were seen in our study population with hypomagnesemia.

Keywords: Type 2 Diabetes Mellitus, Magnesium, Hypomagnesaemia, Acute Coronary Syndrome, Arrhythmias, Ventricular premature contractions, Myocardial Infarction.

Introduction

Magnesium and cell physiology:

Magnesium is the fourth most common cat-ion in the body and the second most common intracellular cat-ion after potassium. It has a fundamental role as a cofactor in more than 300 enzymatic reactions involving energy metabolism and nucleic acid synthesis.[1]

Magnesium modulates ion transport by pumps, carriers and channels. It intervenes in the action of calcium and sodium-potassium ATPase (Na^+/K^+ ATPase). Serving as a cofactor in this enzyme system, it influences sodium and potassium flux across the cell membrane. Magnesium blocks outward movement of potassium through potassium channels in cardiac cells. Decrease in magnesium cause outward movement of potassium, inducing depolarization and, thereby, causing cardiac arrhythmias.[2]

Magnesium homeostasis:

The total body magnesium content of an average adult is 25 g, or 1000 mmol. Approximately 99% of total body magnesium is intracellular or bone-deposited, with only 1% present in the extracellular space. Eighty percent of plasma magnesium is ionized or complexed to filterable ions (e.g., oxalate, phosphate and citrate) and is available for glomerular filtration, while 20% is protein-bound. Normal plasma magnesium concentration is 1.7-2.1 mg/dL (0.7-0.9 mmol, or 1.4-1.7 mEq/L).[3]

The main controlling factors in magnesium homeostasis appear to be gastrointestinal absorption and renal excretion. The plasma magnesium concentration is kept within narrow limits. In contrast with other ions, magnesium is treated differently in 2 major respects: (1) no hormonal modulation of urinary magnesium excretion occurs, and (2) bone, the principal reservoir of magnesium, does not readily exchange with circulating magnesium in the extracellular fluid space.

Hypomagnesaemia and Diabetes: Cause and Effect: Not only has hypomagnesaemia been associated with type 2 diabetes, but also numerous studies have reported an inverse relationship between glycemic control and serum Mg levels .[4-8,14] This is interesting that the induction of Mg deficiency has been shown to reduce insulin sensitivity in individuals without diabetes, whereas Mg supplementation during a 4 weeks period has been shown to improve glucose handling in elderly individuals without diabetes.[7,9] In patients with type 2 diabetes, oral Mg supplementation during a 16-wk period was suggested to improve insulin sensitivity and metabolic control.[10]

Causes of hypomagnesaemia in type 2 diabetics[11]

1. Decreased intake
   a. Poor oral intake
   b. Esophageal dysfunction
   c. Diabetic gastroparesis
2. Enhanced gastrointestinal loss
3. Enhanced renal magnesium loss
   a. Enhanced filtered load
      i. Glomerular hyper filtration
      ii. Osmotic dieresis (glycosuria)
      iii. Volume expansion as a result of excessive volume replacement
      iv. Metabolic acidosis (diabetic ketoacidosis)
      v. Hypo albuminemia
      vi. Micro albuminuria and overt proteinuria
   b. Reduced renal reabsorption
      i. Endocrine dysfunction: Insulin deficiency or resistance
      ii. Electrolyte abnormalities: phosphate and potassium depletion
      iii. Diuretics

Magnesium and Cardiovascular system: The cardiovascular effects of magnesium deficiency include effects on electrical activity, myocardial contractility, potentiation of digitalis effects, and vascular tone.

Hypomagnesaemia and Arrhythmias: Hypomagnesaemia is now recognized to cause cardiac arrhythmia.[12] Electrocardiographic findings include prolongation of conduction and slight ST depression, although these changes are nonspecific. The clinical disturbance of greatest importance is the association of mild hypomagnesaemia with ventricular arrhythmia in patients with cardiac disease.

The likelihood that an injury current will create an abnormal focus near ischemic or infarcted tissue is reduced by magnesium. The ionic basis of the effect of magnesium depletion on cardiac arrhythmia may be related to impairment of the membrane sodium-potassium pump and the increased outward movement of potassium through the potassium channels in cardiac cells, leading to shortening of the action potential and increasing susceptibility to cardiac arrhythmia.[13]

Materials and Methods

Setting: Study was conducted in Coronary Care Unit of Services Hospital, Lahore.

Duration of study: One year.

Study Design: Experimental type of Analytical study.

Sample size: Calculated to be 54, rounded off to 50 (fifty).

Sampling technique: Non probability, consecutive sampling.

Inclusion criteria: Patients of type 2 diabetes mellitus presenting with acute coronary syndrome.

Where "Acute Coronary Syndrome" was defined by presence of any 2 out of following 3 features;

1. Typical clinical history.
2. Presence of ECG changes, diagnostic of myocardial infarction.
3. Biochemical Confirmation i.e., elevated cardiac enzymes.

Exclusion criteria:

- Patients taking Proton pump inhibitors i.e., Omeprazole, loop and thiazide diuretics, nephrotoxins e.g., aminoglycosides, cisplatin, amphotericin-B and cyclosporine.
- Patients having known diseases e.g., chronic diarrhea, malabsorption syndromes.
- Patients who had small bowel bypass surgeries and alcoholics were excluded from study.

Data Collection:

Fifty patients of type 2 diabetes mellitus admitted in coronary care unit suffering from acute coronary syndrome were studied. Informed consent was taken by the patients or their attendants. The diagnosis of hypomagnesaemia was made by finding a plasma magnesium concentration of less than 1.7 mg/dl (0.7 mmol). Electrolytes, including magnesium, calcium, potassium, phosphorus, BUN, serum creatinine and blood glucose was checked. Electrocardiogram (ECG) and cardiac monitoring was done. Holter monitoring was done to measure the incidence of

tachyarrhythmia and Brady arrhythmia episode. The 24 hour ambulatory ECG (Holter) analysis, as predictor of life-threatening arrhythmias, was examined during hospital stay. Magnesium deficiency was corrected in all patients presenting with hypomagnesaemia with intravenous magnesium as per serum magnesium levels as a routine part of treatment of hypomagnesaemia. Data was entered and analyzed in SPSS v17.0.

Results

In our study we observed that 7 (14%) out of 50 patients had hypomagnesemia (<1.7mg/dl), 2 females and 5 males. The number of 'Ventricular premature contractions' in hypomagnesemic patients was 1.5 times the patients with normal magnesium levels (369.71 vs. 215.44 on average). Since ventricular premature contractions are forerunner of many life-threatening arrhythmias as ventricular tachycardia and torsade de pointes, incidence of these arrhythmias will be greater in these patients but NONE of these life threatening arrhythmias was seen in our study population with hypomagnesemia. There was no definite relationship observed between serum magnesium level and 'supraventricular premature contractions' (P value>0.05).

Discussion

Hypomagnesaemia has been reported to occur in 13.5 to 47.7% of hospitalized patients with type 2 diabetes compared with 2.5 to 15% among their counterparts without diabetes.[14-17] The wide range in the reported incidence of hypomagnesaemia most likely reflects the difference in the definition of hypomagnesaemia, techniques in Mg measurements, and the heterogeneity of the selected patient cohort.

In our study significant hypomagnesaemia is present in patients with type 2 diabetes and serum magnesium concentrations was associated with the prevalence of ventricular premature contractions (1.5 times greater than normo-magnesemic patients), indicating that suboptimal serum magnesium may be a contributor to arrhythmias among patients with type 2 diabetes as premature ventricular contractions are predictor of imminent cardiac arrhythmias. Whether magnesium replacement in these patients is beneficial in preventing life threatening arrhythmias or not, had not been studied in our research as post corrected Holter ECG monitoring was not performed. Further studies comprising large number of patients and including Holter ECG monitoring after correction of magnesium level in hypomagnesaemia patients are required.

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References

1. W J Fawcett, E J Haxby, D A Male. Magnesium: Physiology and Pharmacology. BR J Anaesth.1999; 83: 302-20.
2. F Esen, L Telci. Magnesium in ICU: Sin e qua non. In: J L Vincent, 2008 Year book of Intensive Care and Emergency Medicine. Germany: Springer.2008; 491-50.
2. Drueke TB, Lacour B. Magnesium homeostasis and disorders of magnesium metabolism. In: Feehally J, Floege J, Johnson RJ, eds. Comprehensive Clinical Nephrology. 3rd ed. Philadelphia, PA: Mosby. 2007; 136-8.
3. Mather H, Nisbet JA, Burton GH, Poston GJ, Bland JM, Bailey PA, Pilkington TR: Hypomagnesemia in diabetes. Clin Chim Acta. 1979; 95: 235242.
4. Sjogren AS, Floren CH, Nilsson A: Magnesium deficiency in IDDM related to level of glycosylated hemoglobin. Diabetes. 1986;35 :459 463.
5. Pon KK, Ho PWM: Subclinical hyponatremia, hyperkalemia and hypomagnesemia in patients with poorly controlled diabetes mellitus. Diabetes Res Clin Pract. 1989; 7: 163 167.
6. Paolisso G, Sgambato S, Gambardella A, Pizza G, Tesauro P, Varricchio M, D'Onofrio F: Daily magnesium supplements improve glucose handling in elderly subjects. Am J Clin Nutr55. 1992;1161 1167.
7. Resnick L, Altura BT, Gupta RK, Laragh JH, Alderman MH, Altura BM: Intracellular and extracellular magnesium depletion in type 2 (non-insulin-independent) diabetes mellitus. Diabetologia. 1993; 36 :767 770.
8. Nadler J, Buchanan T, Natarajan R, Antoipillai I, Bergman R, Rude R: Magnesium deficiency produces insulin resistance and increased thromboxane synthesis. Hypertension. 1993; 21 :1024 1029.
9. Rodriguez-Moran M, Guerrero-Romero F: Oral magnesium supplementation improves insulin sensitivity and metabolic control in type 2 diabetic subjects. Diabetes Care. 2003; 26 :1147 1152.
10. Pham PC T, Pham PM T, Pham S V, Miller J M, Pham PT T.

Hypomagnesemia in Patients With Type 2 Diabetes. CJASN 2007; 2:366-73.

11. Mandon B, Siga E, Chabardes D, Firsov D, Roinel N, De Rouffignac C: Insulin stimulates Na+, Cl−, Ca2+ and Mg2+ transports in TAL of mouse nephron: Cross-potentiation with AVP. Am J Physiol. 1993; 265: F361 F369.
12. Agus ZS, Morad M. Modulation of cardiac ion channels by magnesium. Annu Rev Physiol. 1991; 53:299-307.
13. Pham PC, Pham PM, Pham PA, Pham SV, Pham HV, Miller JM, Yanagawa N, Pham PT: Lower serum magnesium levels are associated with more rapid decline of renal function in patients with diabetes mellitus type 2. Clin Nephrol. 2005; 63 :429 436 [published erratum appears in Clin Nephrol 64: 248, 2005].
14. McNair P, Christensen MS, Christiansen C, Madsbad S, Transbol I: Renal hypomagnesaemia in human diabetes mellitus: Its relation to glucose homeostasis. Eur J Clin Invest12 :81 85,1982.
15. De Lordes Lima M, Cruz T, Pousada JC, Rodrigues LE, Barbosa K, Cangucu V: The effect of magnesium supplementation in increasing doses on the control of type 2 diabetes. Diabetes Care. 1998; 21 :682 686.
16. Walti MK, Zimmermann MB, Spinas GA, Hurrell RF: Low plasma magnesium in type 2 diabetes. Swiss Med Wkly. 2003; 133 :289 292.

Case Report

ENDOBRONCHIAL RUPTURE OF PULMONARY HYDATID CYST FOLLOWED BY ANAPHYLACTIC SHOCK AND FULL RECOVERY

Farrukh Iqbal and Misbah-uz-Zehra

Abstract: A 36 years old woman with a past history of multiple hydatid cysts in liver presented with dry cough and low grade fever. She was found to have a large hydatid cyst in the left lower lobe of lung which ruptured endobronchially. At the time of induction of anesthesia, the cyst ruptured and she went into anaphylactic shock and then cardiac arrest. She was successfully resuscitated and later on a partial pneumonectomy was done. She made an uneventful recovery. Although hydatid cyst is a globally prevalent disease and has a low mortality rate but a ruptured cyst has a relatively high mortality and morbidity in terms of dissemination of disease into other parts of body therefore a careful follow-up is required in case of rupture of the cyst.

Key words: Hydatid cyst, E. granulosis, endobronchial rupture, anaphylactic shock.

Introduction

Hydatid cyst disease is an ancient disease and these bladder like cysts were described in animals in Babylonian Talmud, by Hippocrates in 4th century B.C., Aratacus in 1st century A.D. and Galen in 2nd century A.D.[1,2], but Francesco Redii was the first to describe the parasitic nature of these cysts and Pierre Simon Pallas in 1766 hypothesized that these cysts are larval stages of the tape worms[3]. In 1853, Carl von Siebold demonstrated the development of adult tapeworm in dogs fed with cysts from the sheep[4] and human infection by infected dogs was demonstrated in 1863 by Bernhard Naunyn [5]. The attempts to remove these cysts surgically were also made in 16th century which has been the most effective treatment so far. Cystic echinococcus is an emerging zoonotic infection with worldwide distribution and estimated human burden of disease is 285, 407 (95% CI). [6] , and still on the rise especially in the countries previously thought to be free of disease.[7] The recorded data may be an underestimation of the actual disease burden as it remains clinically silent for many years .

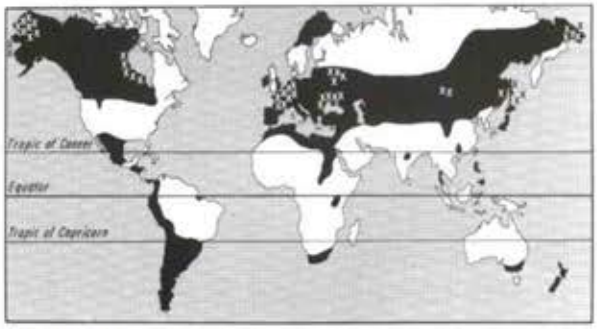

Figure-1: Global distribution of E.granulosis (black) & E.multiocularis (x).

The greatest prevalence of cystic echinococcus is found in temperate zones including south America, the entire Mediterranean littoral, southern and central parts of former Soviet union, central Asia, China, Australia and parts of Africa, mainly the cattle raising countries[8,9]. (**Fig.1**)

Case

A 36 years old woman of Afghan origin presented with persistent dry cough and low grade fever for last three months. There was no other complaint. In past she had multiloculated hydatid cysts (fig. 2) in liver for which she was operated in Afghanistan three years ago. She was married, housewife with two healthy children. Her family history was strongly positive for hydatid disease and her mother, brother and sister-in-law had suffered from this disease in past. They had a

Figure-2: CT abdomen showing multiloculated hydatid cyst in the right lobe of liver.

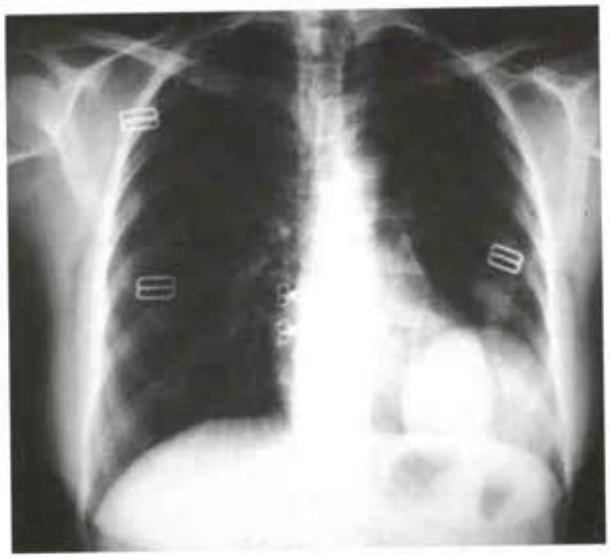

Figure-3: chest radiograph showing a round opacity in left lower lung (hydatid cyst before

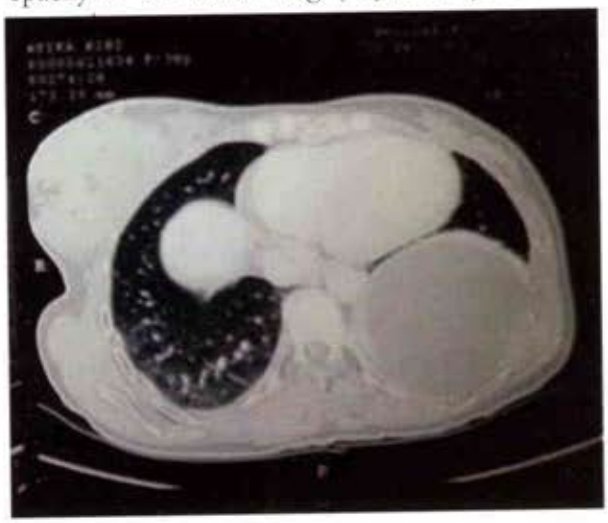

Figure-4: CT chest; a large fluid filled cavity in left lung.

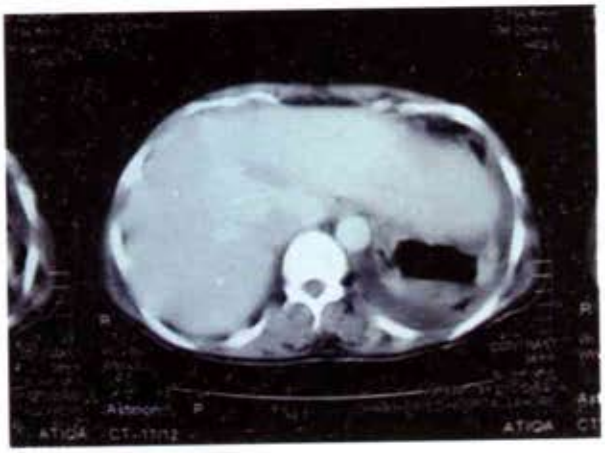

Figure-5: CT abdomen showing ruptured hydatid cyst in lower part of left lung.

Figure-6: Chest radiograph showing a large fluid filled cavity in left lower lung (ruptured hydatid cyst)

pet dog at home. She was investigated in Afghanistan, was found to have a large fluid filled cyst in lower lobe of left lung **(fig-3 & 4)** and was brought to Pakistan for further treatment. She was admitted to the hospital, baseline investigations were done which showed a hemoglobin of 11.2 g/L, white cell count of 14.56 x 109 /L and platelet count of 281x109/L. Her coagulation profile, RFT's, LFT's and serum electrolytes were all normal except for a low serum albumin of 2.7 g/dL. She was also tested for E. granulosis antibodies which came out to be highly positive 1:2038. On second day of her admission she stared expectorating as well as nasally regurgitating yellow coloured saltish fluid. Endobronchial leakage of cyst fluid (figs. 5 and 6) was suspected and she was prepared for surgery and put on IV antibiotics and oral antihelmintics. At the time of induction of general anesthesia the cyst partially ruptured into the lung parenchyma and she went into anaphylactic shock , respiratory distress syndrome (fig. 7) and cardiac arrest. CPR was started and she was resuscitated successfully after 5 minutes. Later on after stabilizing the patient, left sided pneumonectomy (fig. 8) was done and she made a remarkable recovery and was discharged home and to

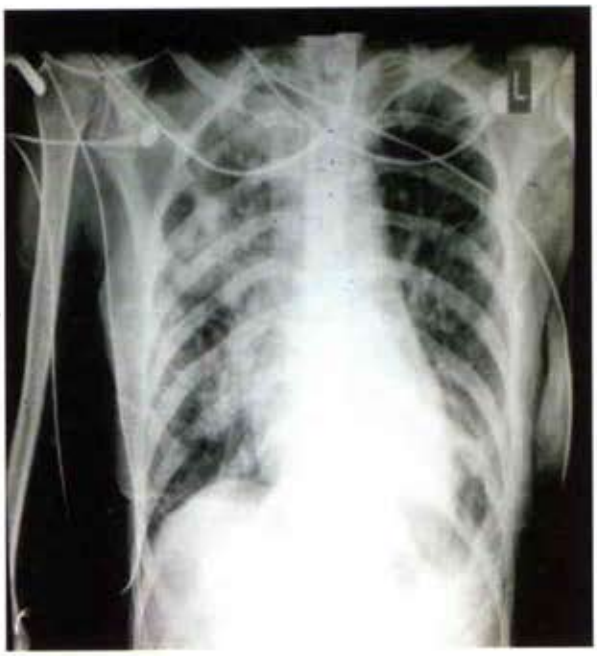

Figure 7: Chest radiograph after development of ARDS.

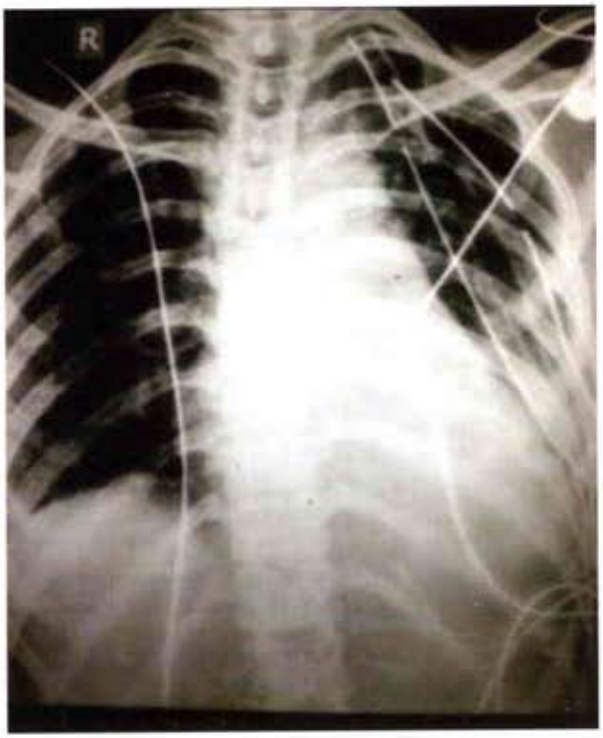

Figure 8: Chest radiograph after left sided partial pneumonectomy

be followed up on outpatient basis. She attended the outpatient department after a couple of weeks and was found to be in an excellent health without any chest symptoms.

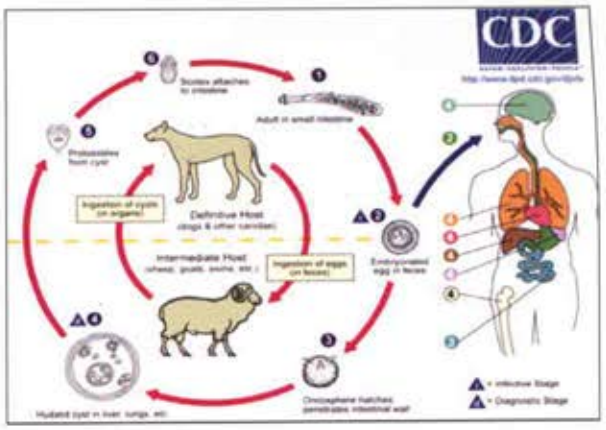

Figure 8: life cycle of E.granulosis. 1. Adult worm; 2. Eggs; 3. Oncosphere; 4. Hydatid cyst with daughter cyst; 5. Protoscolex; 6. Scolex.

Discussion

Echinococccus is a parasitic cestode of phylum platyhelminthes commonly known as tapeworms. Three forms occurring in humans are

E. granulosis (cystic hydatid disease)

E. multiocularis (alveolar hydatid disease)

E. vogeli and E.oligarthrus (polycystic hydatid disease)

The adult parasite is a small tapeworm about 3-6mm long that lives in the small intestine of definite hosts like dogs or other canids, where it lays eggs which are passed in their feces and ingested by intermediate hosts like sheep, goat swine etc. The eggs hatch in their small bowel and the oncosphere migrates into different organs by penetrating the gut wall and through the circulatory system where they develop into cysts which gradually enlarge and produce proctoscolices and daughter cysts which fill the cyst interior. Again when the dogs and other canids feed on the viscera of these animals they become infected and the life cycle goes on. Humans get infected accidentally when they come into contact with the fecal matter of definite hosts and ingest it. Molecular studies using mitochondrial DNA sequence have identified ten distinct genotypes (G1-G10) within E.granulosis with different host affinities; the sheep strain G1 being the most common10.

In spite of several WHO/FAO sponsored meetings on cystcercosis / hydatidosis the disease is still on the rise in countries previously free of it and also no increase in the public awareness of the global nature of disease has been seen8,9. It is evident from the life cycle of echinococcus that disease is preventable at various stages in both the definite and intermediate host. Important measures to break the chain of transmission include:

- Prevention of dog feeding on carcasses of infected sheep
- Stray dog population control
- Restrict home slaughter of livestock
- Prevention of food and water contamination by fecal matter from dogs
- Hand washing after dog handling and before eating food
- Vaccination of sheep by EG95 has a cure rate of 86% and 99.3% reduction in the number of cysts. Also vaccination of dogs leads to 97-100 % protection against worm growth and egg production11.Studies also show that most effective intervention against the eccinococcus is combination of sheep and dog antihelmintic treatment12.
- The role of better diagnostic tools e.g. dog coproantigen detection has also been elaborated.
- Recent treatment modalities include:
- Albendazole alone for three months or longer followed by rest and repeated cycles if required.
- PAIR (in case of inoperable cysts) which consist of percutaneous aspiration, injection of scolicidal agent (e.g. 95% ethanol or 0.5% cetrimide) and reaspiration.
- Alveolar hydatid cyst disease should be treated with wide surgical resection in conjuction with oral albendazole.
- Other drug options include mebendazole and praziquantel.

The use of better diagnostic tools, increasing public awareness regarding health and hygiene and new anti parasitic vaccines hold a potential to speed up the eradication of hydatid cyst disease13.

It is important to realize the gravity of the condition and its potential complications including death. Prompt detection of anaphylactic shock and its management with intensive care facilities can save life as shown by our case.

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References

1. Foster W.D. 1965: A history of parasitology. Livingstone, Edinburgh, United Kingdom.
2. Grove D.I. 1990: A history of Human Helminthology. CAB International. Wallingford. United Kingdom.
3. Kean B.H, Mott K.E, Russel A.J. 1978. Tropical medicine and parasitology: Classic investigations. Cornell University Press. Ithaca. N.Y.
4. Von siebold C.T. 1853. Ueber die verwandlung der Echinococcus-brut in Taenien.Z.Wissen.2001.4:409-425.
5. Naunyn B.1863. Ueber die zu Echinoccocus homonis gehörige täen. Arch. Anat. Physio. Wiss.Med.4:412-416.
6. Budke, Christine M, Deplazes P. Torgerson P.R. "Global socioeconomic impact of cystic echinicoccus". Emerging infectious disease. 2006.web.15 feb 2010.
7. Matossian R.M, Rickard M.D, Smyth J.D:Hydatidosis:a global problem of increasing importance. Bull of WHO, 55(4):499-507(1977).
8. Yang Y.R, Sun T, Zhang J, Teng J, Liu X et al. Community Surveys and risk factor for analysis of human alveolar and cystic echinoccocus in Ningxia Hui Autonomous region. China. Bull. of WHO . 2006; 84: 714-21.
9. Moro P.H, SChantz P.M. Echinoccocus: historical landmarks and progress in research and control: Ann. Trop. Med. Parasitol 2006; 100:703-14.
10. Thompson R.C. Biology and Systematics of Echinococcus. In: Thompson Rc. Lymberg A.J, editor. Echinoccocus and hydatid disease. London. CAB International; 1995.p1-37.
11. Zhong W, Zhang Z, Shi B, Li J, You H, Tulson G, et al. Vaccination of dogs against Echinoccocus granulosis, the cause of cystic hydatid disease in humans. J Infect Dis 2006; 194:966-74.
12. Togerson P.R. Mathematical models for the control of cystic Echinoccocus. Parasitol Int 2006; 55(suppl):s253-8.
13. Craig P.S, McManus D.P, Lightowlers M.W et al.Prevention and control of cystic Echinoccocus. Lancet Infect Dis 2007; 7:385-394.
14. Junghass T et al. Clinical Management of cystic Echinococcus: State of art, problems and perspectives. Am J Med Hyg. 2008. Sep; 79(3):301-11.

Intersting Medical News

CHANGES IN HOUSEHOLD ROUTINES HELP REDUCE KIDS' OBESITY: STUDY

PARENTS WHO LIMITED KIDS' TV TIME, INCREASED SLEEP TIME SAW LESS EXCESS WEIGHT GAIN IN CHILDREN

Small changes in household routines, such as limiting TV time and increasing sleep time, can help minimize excess weight gain in young children at high risk of obesity, according to new research.

"Improving household routines led to a reduction of the risk of childhood obesity," said study researcher Dr. Elsie Taveras, chief of general pediatrics at Massachusetts General Hospital for Children in Boston.

"We were able to improve sleep time (and) reduce time spent watching television, and we were able to show that in the intervention group, children had a lower rate of weight gain," Taveras said.

About 17 percent of American children and teens are obese, according to the U.S. Centers for Disease Control and Prevention. And lower-income kids are at particular risk.

"Already by age 2, we see higher rates of obesity among low-income, racial and ethnic minority families," Taveras said.

Both lack of sleep and too much "screen time" are linked to childhood obesity. So Taveras wanted to see if simple changes in household routines could make a difference.

Her team recruited 121 families with 2- to 5-year-old children and assigned half to make these small changes with the help of "health coaches," who made a few home visits and phone calls. The other families got information on child development, such as playing with a child to prepare him or her for school.

Close to half of the children were already overweight for their age and sex, the study authors noted.

After six months, children in the intervention group were sleeping about three-quarters of an hour more at night and watching TV for one hour less on weekends, according to the study published online Sept. 9 in JAMA Pediatrics.

What's more, they had a slower rate of weight gain: After six months, their body mass index (BMI) -- a measure of weight in relation to height -- had dipped. Weight loss was not the goal, the researchers stressed -- just healthier weight gain.

"We would not expect them to lose weight," Taveras said. "They are growing in height and weight. We aimed to slow down the rate of their gaining."

The changes that families made were simple, Taveras said. To encourage more sleep, parents could give their child a warm bath or read a book before bed, acclimating the children to the routine and a consistent bedtime. (Experts say 2- to 5-year-olds need 11 or more hours of sleep to be well-rested.)

Parents said they often used TV as a way to occupy their children while they did household chores. So the researchers supplied the families with simple arts-and-crafts sets and suggested they substitute that for TV.

The researchers also mapped out each family's neighborhood, to help them find nearby playgrounds and parks, as an alternative to TV time.

Taveras said pediatricians and other health care providers might consider suggesting the program -- minus the coaches -- to their patients.

The study is an important one, said Dr. Thomas Robinson, a professor of pediatrics and medicine at Stanford University and Lucile Packard Children's Hospital at Stanford.

"It demonstrates that it may be possible to influence some important health-related behaviors -- sleep and TV watching time -- along with body mass index, with a counseling program for the parents of preschoolers," he said.

"These behaviors and BMI have not been easy to change in a world where junk food and screen time are so heavily marketed, and families are dealing with tremendous financial and social challenges," Robinson said. "I think it is exciting to see studies like this one showing positive results."

Much more research on "possible solutions" is still needed, Robinson said. "But studies like this one demonstrate that the science is progressing and can help us design programs to help slow and hopefully reverse the obesity epidemic."

The families in the study were mostly minority: Just over half of the children were Hispanic, one-third were black, and about 15 percent were classified as "other." The intervention worked equally well across those groups, Taveras said, but it is not clear how well it would work for more-advantaged families.

Another expert who reviewed the findings noted that the study had limitations.

"I think the study findings are encouraging," said Simone French, professor of epidemiology and community health director of the University of Minnesota Obesity Prevention Center. "Researchers are starting to realize that the home environment is an important setting to try to intervene with parents."

However, she said, limitations of the study include the self-reports of changes, although that is a standard way of measuring the behaviors. The challenges, she said, include obtaining funding for the home visits so parents can have support in making the changes.

SOURCES: Elsie Taveras, M.D., M.P.H., chief, general pediatrics, Massachusetts General Hospital for Children, Boston; Thomas Robinson, M.D., M.P.H., professor, pediatrics and medicine, director, Center for Healthy Weight, Stanford University and Lucile Packard Children's Hospital at Stanford, Calif.; Simone French, Ph.D., professor, epidemiology, and community health director, University of Minnesota Obesity Prevention Center, University of Minnesota School of Public Health, Minneapolis; Sept. 9, 2013, JAMA Pediatrics, online

SMALLER TESTICLES, BIGGER PARENTING ROLE, STUDY SUGGESTS

RESEARCHERS EXPLORE WHY SOME DADS ARE MORE NURTURING

Are men with smaller testicles more involved dads? Could be, say the authors of a new study.

Anthropologists from Emory University in Atlanta wanted to try to better understand why some men are more actively engaged in child rearing than others, said study lead author James Rilling.

"We know children with involved fathers -- at least in modern western societies -- have better developmental outcomes socially, psychologically, and educationally. Yet, some men choose not to be involved," he said.

So the study authors decided to investigate whether anatomy or brain function explained the variation in parenting styles.

The research, published in the Sept. 9 issue of the Proceedings of the National Academy of Sciences, included 70 men who were the biological fathers of children between the ages of 1 and 2. All of the men lived with the biological mother of their child. They ranged in age from 21 to 43.

Rilling and his colleagues took blood tests at the start of the study to measure the men's testosterone levels. They also conducted interviews with the fathers and mothers separately about how involved their partner was with their child: how often did they change diapers, feed and bathe their little one, prepare a meal, take the child to the doctor?

"We relied on the mothers' reports because we thought that would be less biased," said Rilling, an associate professor of anthropology, psychiatry, and behavioral sciences.

The researchers also measured each man's brain activity using functional magnetic resonance imaging (fMRI) while the fathers viewed photos of their children with various expressions: happy, sad and neutral. A structural MRI was also used to measure the size of each man's testicles.

The findings, Rilling said, suggest that "men with smaller testes and lower testosterone levels were more involved in care-giving. The men with smaller testes volume also had a stronger neural response -- the fMRI showed more activity in the ventral tegmental area, a reward center of the brain -- when the men viewed images of their children."

The researchers concluded that while the new findings suggest there's a link between testes size and a man's involvement with his kids, anatomy isn't a sure predictor of a male's parenting potential.

"It could also be that when men become more involved as caregivers, their testes shrink," he added.

Dr. Joseph Alukal, an assistant professor in the department of obstetrics and gynecology and urology at NYU Langone Medical Center in New York City, said the researchers are addressing a complex issue, and the study makes some scientific assumptions.

"They've assumed a few things and I'm not sure they have the science to back it up," he said.

"You can't correlate testes size to hormones. Testes size -- barring an injury -- is very much stable. Testosterone level is not," Alukal said. He noted that testosterone levels are "hugely variable" depending on the time of day and other factors.