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Corona Pandemic in Pakistan: A Success Story

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Since declaration as pandemic by WHO on 12.3.20, COVID 19 devastation has jolted the world mentally, psychosocially and economically.[1] As of recent updates, it has affected 213 countries with 22,646,894 cases and 792,358 deaths reported worldwide.[2] Almost twenty percent of World population was put under lockdown, sealing borders, closing institutions and markets.[3] Despite all efforts and interventions in place, we have seen collapse of health systems, death toll and mass graves in European countries.

Pakistan was no exception with first case reported on February 26,2020 in Karachi and confirmed cases to date are 292,174 with 6231 deaths.[4] Pakistan, house of 230 million people with 24.6% living below poverty line, with meagre resources and a weak healthcare system.[5] The country was liable to face millions of deaths and breakdown in terms of economy. The Government of Pakistan took drastic measures of imposing lockdown, banning air travel, national disaster management authority(NDMA) issuing guidelines and setting up corona quarantine centers.[6] It was impossible for anyone to curb this menace with poor resources in a developing country like ours. The imperial college, London study estimated 13.6 million infections and 80,000 deaths in Pakistan by August 04, 2020.[7]

Post Eid, at end of May, it appeared to be heading towards a catastrophe as, if not more, big in magnitude as some European countries. The danger increased to alarming level, when the hospitals in major cities became overwhelmed with serious patients. Intensive care units in the largest hospitals filled up, and families were frantically going from one hospital to another in the search for a bed. There was panic all around, private hospitals had to be called in as the fledgling health system seemed to collapse in the ensuing days.

But just a few weeks later in July, hospital admissions appeared to fall drastically. The fall was so sharp that it astounded everyone. Initially it was thought that the conspiracy loving nation has stopped coming to the hospitals with a fear of death. But the decrease has been sustained. With around 6,300 coronavirus deaths till first week of September, Pakistan appears to have fared far better than most Western countries. The Pakistani government was quick to congratulate itself as did United Nations and Wall street journal described Pakistan as a coronavirus 'bright spot'.[8] WHO has included Pakistan amongst seven countries from whom international community should learn how to deal with pandemic.

The sudden decline in patients has puzzled every one and is no less than a miracle. There are theories which may never be proven.

Can the data from Pakistan be trusted? Are the figures manipulated? There are certainly many more coronavirus cases than the roughly 298,000 officially recorded, as the testing has been relatively low, due to economic constraints, but the recorded drop in infections is substantiated by the fact that the proportion of tests that come back as positive has also been decreasing, as have the hospital admissions and number of deaths.

So maybe Pakistan is far away from Europe with different environment and genetics and may be infected by a different and weaker strain. Various theories of hot weather, immunity, BCG vaccinations and early response to pandemic have been postulated.[9] The cities in neighboring India which share the same attributes and seem to have been worse affected, refute these theories. One major difference may be that Pakistan has less densely populated slums as compared to India with majority population residing in open village areas where virus never penetrated.

One obvious difference is the age of Pakistani population which is like a pyramid, majority being a young population with an average age being 22 years and only 4% population being above 65 years, both in sharp contrast to the demographics of European

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population. But it's less clear why the situation hasn't been more similar to that across the border in India, with similar population. The holy month of Ramadan with fasting, prayers and taking more care of personal hygiene might have a role to play.

An interesting, but unethical, theory is the use of corticosteroids by the local GP and the quacks for trivial flu like illness, the first tier care provider for the majority of the population. The theory seems plausible as multiple studies across the world is advocating earlier use of hydrocortisone and dexamethasone.[10]

Pakistan government efforts of smart lockdown, extensive media campaign, establishing helpline for public, central dashboards for COVID reporting, coordinated and coherent strategy, formation of National command and operation centre (NCOC), contact tracing and care using polio workers definitely need applause. The cash assistance with "Ehsas" program which disburse Rs145 billion emergency cash to daily wagers along with charity by public during Ramadan and lockdown, prevented migration of people from urban to rural areas curbing massive spread of disease.

Still, none of the theories could be substantiated and really there is no scientific explanation, we must thank Almighty for His grand miracle. Should Pakistan sustain its progress in the next couple of months, it will be a major turnaround, and feat for government. The important concern for the time being is that we need to exercise caution and government has to endorse it. The practice of face masks, social distancing and hand washing have to be considered new norms. In the wake of opening schools, we keep our fingers crossed.

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COVID19: Clinical Presentation and Diversity Related to Age and Gender

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Abstract

Objective: To determine frequency of different clinical symptoms in patients of Covid19 infection and to explore effect of age and gender on symptoms distribution and behavioral risk of exposure.

Methods: A cross sectional observational study was conducted at Department of Medicine, Services Institute of Medical Sciences. After informed consent, patients confirmed to have Covid19 infection were interviewed for presenting symptoms, co-morbid illnesses and risk factors for exposure to corona virus. Data was analyzed using SPSS® 22 using chi square and t test.

Results: Total of 114 patients with mean age of 55.03 ($\pm$11.9) and male to female ratio of 1.65:1 (71/43) were included. Fever 84 (73.7%), shortness of breath 93 (81.6%) and cough in 76 (66.7%) patients were major symptoms. Exposure to Covid19 positive patients was present in 12 (10.5%) patients, 74 (64.9%) continued their outdoor occupational work and only 68 (59.4%) were wearing mask. We identified nausea (p value 0.002, OR 0.30 95% CI 0.13-0.69) and loss of consciousness (p value 0.002, OR 0.13 95% CI 0.03-0.59) as less common symptoms in males as compared to females while cough was more common in males (p value 0.029 OR 1.36 95% CI 1.003-1.85). No difference in clinical presentation was noted in different age groups.

Conclusion: Fever, dyspnea and cough are major presenting complaints of Covid-19 infection. Cough is more common and nausea and unconsciousness are less in male patients while clinical symptoms does not vary with age.

Key Words: Age, Covid19 infection, Gender, Symptoms

Introduction

Novel Corona virus infection (SARS-COV-2) has changed the norms of life. We are no more living the way we used to. It is largely due to its rapid trans-mission and high infectivity. Despite having reported mortality varying between 0.1-10% in different countries,[1,2] it has forced people to stay away from each other, to abandon public gatherings and social interaction and cancellation of holidays, excursions and sports.

Despite having spread to each and every community over last six months and having affected more than 19 million people with more than half a million deaths,[3] we still have no remedy for this illness. Only option for disease control is prevention and over these months we have learned that wearing mask in public, social distancing and frequent hand washing are the tools which have shown benefit in this fight with this pandemic.[4]

However effective application of these measures need public awareness, development of standard operating procedures (SOPs) and implementation in community. Especially now, when people are getting fed up with restrictions and economic cost of lock-downs is overshadowing disease morbidity and mortality, we need to open up essential services and businesses with strict application of SOPs.

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Relaxa-tion of restrictions on public movement without following SOPs will allow disease to grow exponen-tially with collapse of health services. Public aware-ness and self-responsibility for following precautions is only way forward.[5]

Effective handling of pandemic of this proportion needs comprehensive understanding of its patho-physiology, routs of transmission, diversity in its clinical presentation and risk factors contributing to its severity. Initially it was considered as a variant of flu virus resulting in delayed implementation of preventive measures leading to spread of disease globally. However, knowledge has evolved over last six months and each region and country is focusing on understanding interaction of this virus with their community to curb its spread.

Pakistan documented its first case of corona virus infection in late February 2020 with first death in mid of March. Despite enforcing restrictions and lock-downs, it grew exponentially during months of May and June due to unavoidable need for relaxation in lockdowns. As the pandemic is evolving, there is urgent need to observe and document clinical behavior of this illness in our population. We planned an observational study to explore modes of clinical presentation of Covid19 patients being admitted in hospital and to determine effect of patient's gender and age on symptoms of disease.

Methods

This cross sectional study was carried out at Depart-ment of Medicine, Services Institute of Medical Sciences (SIMS) after approval of Ethical Review Board. Patients included were suspected or confir-med cases of Covid-19 patients being admitted at Services Hospital via Accident and Emergency or Outpatient clinic. Informed consent was taken before inclusion in study. Definition for suspected and confirmed case was according to clinical manage-ment guidelines for Covid-19 infection as published by Ministry of National Health Services, regulations and coordination Government of Pakistan. Only patients confirmed to have Covid-19

Demographic data of patients including their age, gender were recorded. Detailed clinical history was explored for symptoms related to patient's illness. Patients were interviewed for presence of fever, chest pain, dyspnea, cough, abdominal pain, vomiting, jaundice, altered sensorium etc. Duration of these symptoms along with severity were also noted. Co-morbid illness like diabetes mellitus, hypertension, ischemic heart disease, chronic liver disease and chronic kidney disease were also noted. Risk factors for virus exposure like contact with positive patient, continuing occupational work during lockdown, intercity or foreign travel and wearing mask or not were also inquired from patients included in study. Data was collected on pre-designed proforma.

Statistical Analysis

Data will be entered in SPSS 22®. Numerical varia-bles were described as mean ± standard deviation (SD) while nominal and categorical variables were given as percentages. Patients with age 50 or below were compared with those above 50 years of age using student's t test for numerical variables and chi square for nominal or categorical variables. We also compared male and female patients for diversity in clinical presentation and risk factors for being exposed to covid19 infection. P value of less than 0.05 was considered significant. For variables with significant association, we determined Odds ratio (OR) with 95% confidence interval (CI).

Results

Total of 114 patients with confirmed Covid-19 infection were included in study. Mean age of study patients was 55.03 (11.9) with male to female ratio of 1.65:1 (71/43). All patients were symptomatic at time of admission to hospital. Mean duration of symptoms was 7.5 (±4.6) days before coming to hospital with 80 (70.2%) patients were symptomatic for 5 days or more.

Fever 84 (73.7%) along with shortness of breath 93 (81.6%) were the most common presenting comp-laints. Fever was high grade in 25 (21.9%) patients while remaining had low grade fever. Cough was present in 76 (66.7%) patients and it was dry in majority of patients with sputum in 23(20.2%) patients only. Sore throat was complained by 32 (28.1%) patients, 54(47.4%) had fatigue and myal-gias and 15(13.2%) reported chest pain. Vomiting was present in 14 (12.3%) patients, 4 (3.5%) had abdominal pain and 17 (14.9%) patients had diarrhea at time of admission. Altered sensorium was present

in 11 (9.6%) patients at time of presenting in hospital.

Diabetes mellitus was present in 51 (44.7%) patients, 48 (42.1%) were hypertensive and 13 (11.4%) patients had history of ischemic heart disease. Positive history of contact with Covid19 patient was present in 12 (10.5%) patients, 14 (12.3%) patients traveled to other city during prior 2 weeks, 74 (64.9%) were continuing their occupational work and only 68 (59.4%) were wearing mask while being out of home. We compared patients of 50 or less years of age with those above 50 years for clinical symptoms and behavioral risk as shown in table-I and no significant difference was noted between these age groups. However on comparing male and females for these variables as shown in table-II, we identified nausea (p value 0.002, OR 0.30 95% CI 0.13-0.69) and loss of consciousness (p value 0.002, OR 0.13 95% CI 0.03-0.59) less common symptoms in males as compared to females while cough was more common in males (p value 0.029 OR 1.36 95% CI 1.003-1.85). Males are more likely to continue working outdoor despite restrictions than females (p value 0.005, OR 1.52 95% CI 1.09-2.13).

Table 1: *Correlation of Age Groups and Presenting Symptoms and High risk behaviors in Covid-19 Infection*

Variables	Age > 50 years (n-68)	Age ≤ 50 years (n-46)	P value
Fever	52	32	0.61
Cough	47	29	0.60
Dyspnea	55	38	0.52
Sore throat	20	12	0.78
Vomiting	8	6	0.78
Diarrhea	9	8	0.48
Altered sensorium	7	4	0.82
Chest tightness	7	8	0.23
H/O Contact with covid19 patient	6	6	0.43
Outdoor working	45	29	0.93
Mask in outdoor	37	31	0.10

Discussion

Clinical behavior of novel corona virus resulting in Covid-19 infection has mesmerized whole medical fraternity over last 6 months. Astonishing speed of dissemination of virus in communities across the world has not given enough time to scientist to develop an understanding of this fatal illness. Knowledge regarding its behavior is still evolving when around

Table 2: *Correlation of Gender and presenting Symptoms and High risk Behaviors in Covid-19 Infection*

Variables	Male (n-71)	Female (n-43)	P value
Fever	56	28	0.10
Cough	53	23	0.029
Dyspnea	61	32	0.12
Sore throat	21	11	0.645
Nausea	7	14	0.002
Vomiting	6	8	0.10
Diarrhea	8	9	0.16
Altered sensorium	2	9	0.002
Chest tightness	7	8	0.18
Outdoor working	53	21	0.005
Mask in outdoor	42	26	0.89

20 million people are already infected world-over.[6]

We have explored pattern of clinical symptoms in covid-19 patients of our community presenting in a tertiary care hospital. This information will facilitate formulation of screening and preventive strategies for our population. Predominant symptoms in our patients are fever, cough and shortness of breath. In a study of 262 patients in Beijing being admitted in emergency medical service, 82.1% had fever, 45.8% had cough, 26.3% had fatigue.[7] In another study of 276 patients from Zengdu District, Hubei Province, fever was seen in 227 (82.2%) patients and cough in 218 (78%) patients.[8]

If we follow patients in other parts of world, similar symptom pattern is being observed. In a study of 393 patients from New York, 79.4% had cough, 77.1% had fever, 56.6% experienced dyspnea, diarrhea was observed in 23.7% patients while 19.1% had nausea and vomiting.[9]

We noted diarrhea in 17 (14.9%) of our patients. In a meta-analysis published last month, diarrhea was present in 10.4% patients of Covid-19 infection although different studies have identified it prevalence to be between 5-50%.[10] Sensorium of 11 (9.6 %) patients was altered at time of hospital admission in our study. Recent research has shown that SARS-COV-2 virus can enter brain via hematogenous or olfactory rout and can result in neurological manifestations like agitation, delirium or even coma. It can also result in encephalitis.[11]

Despite restrictions on public movement and lock downs majority of our patients 74 (64.9%) were

continuing with their outdoor occupational work and only 68 (59.4%) patients were wearing mask while being outside home. In a cross sectional survey of 4850 Malaysian residents, only 51.2% were wearing face mask in late march despite exponential community spread of illness.[12]

We have observed nausea and altered sensorium significantly more in females while cough is more prevalent in men whereas clinical symptoms profile remains same across different age groups. Many recent studies have confirmed that disease behaves differently in women being less susceptible to infection and even disease mortality is remarkably less in women. It is due to different innate immune response, steroid hormones and factors related to sex chromosomes.[13] We have noted difference in clinical manifestation of illness as well.

Our data will enable us to develop better understanding of disease in our population. Community programs to control this epidemics can only be successful if these are based on robust data regarding epidemiology of disease in indigenous population. Further large size studies are needed to guide our national strategy to control this pandemic.

Conclusion
Fever, dyspnea and cough are major presenting complaints in patients of Covid-19. Cough is more common in men and nausea and unconsciousness are more prevalent in women while pattern of clinical symptoms does not change with age.

Author's Contribution:
SS: Conception and Design Analysis and Interpretation, drafting of article, approval of the version, agreement to be accountable for all respect.
HM, UW, YM,MNA: Acquisition of data, revising the manuscript, approval of the version, agreement to be accountable for all aspect
MAN: Conception and design, revising manuscript critically, final approval of the version and agreement to be accountable.
AR, BR, M, MA, DR: Data Collection

Conflict of Interest: None

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Impact of COVID-19 on Mental Health of Pregnant Women Attending Tertiary Care Hospital

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Abstract

Objective: To determine the frequency of psychological symptoms depression, anxiety, stress and insomnia and perceptions of transmission to baby in pregnant patients during the COVID-19 pandemic.

Methods: Pregnant women attending antenatal clinic at department of Obstetrics and Gynecology, Services hospital Lahore were recruited. Data was collected through a questionnaire which was filled by a doctor after face to face interview of the patient. Comparison of demographic data and psychological variables were noted between insomnia and non-insomnia groups.

Results: Out of 310 total pregnant women, 184 (61.32%) had depression, 228(76%) anxiety and 88(29.3%) had stress with insomnia in 223(74.33%) patients. 273(88.06%) participants had perception of transmission of disease to babies and 214(69.03%) expected bad outcome for newborn. Symptoms of depression (83.86% vs 8.05) anxiety (95.62% vs 28.73%) and stress (53.5% vs 1.14%) were seen more in insomnia group(p<0.05). Illiterate and poor socioeconomic status women were more prone to insomnia in this pandemic(p<0.05)

Conclusion: Pregnant women have psychological stress and false perception of vertical transmission and adverse fetal outcome during the COVID-19 pandemic. Adequate counselling sessions are needed to eliminate these false perceptions and relieve psychological stress.

Keywords: Pregnancy, COVID-19, Mental Health

Introduction

The COVID-19 pandemic is caused by severe acute respiratory syndrome corona virus. This disease originally started in China's Hubei province in December 2019 and has affected 213 countries and was declared a pandemic in March 2020.[1] It has debilitated the world socially and economically leaving deep scars. The situation is worse in developing countries who have meagre resources to tackle devastation. This pandemic has caused significant mental stress to public at large and health care workers in particular.[2,3] Although government has done efforts to improve public awareness about preventive strategies but prolonged lockdown, social media constantly reporting death has been proved to be counterproductive.

Pregnancy is actually a state of altered immunity to allow growth of the fetus. The biological adaptive changes during pregnancy make women more vulnerable to this disease.[4] Stress and anxiety during pregnancy is a common phenomenon related to perinatal outcome. It is estimated that 10-16% of pregnant women suffer from mental problems during pregnancy and post-partum period.[5] Prenatal maternal distress has negative impact on course of pregnancy, psych emotional and cognitive development of baby.[6] Corona pandemic is expected to cause significant mental stress to pregnant women since a lot of inadequate information and conspiracy theories such as administration of poisonous injections are circulating on social media. This, coupled with restricted access to mental health services, social distancing, long stay at home, absence of emotional support and conflicting reports about disease transmission to fetus have aggravated the situation.

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with significant pregnant population. Two studies have been published from Pakistan to evaluate mental distress and perceptions regarding pandemic in pregnancy showing different level of stress and perception of transmission to baby.[7,8] We planned this study to determine the frequency of psychological distress like insomnia, depression, anxiety and stress in pregnant patients so that proper counselling could be offered to these patients.

Methods

This cross-sectional survey was conducted at Obstetrics department of Services Institute of Medical Sciences, Services hospital Lahore. It is a public sector tertiary care hospital. Ethical approval was taken from institutional review board. A sample size of 300 women was selected by random convenience sampling. The pregnant women attending the antenatal clinic or in postnatal ward within 24 hours after delivery were invited to take part in study. Agreeing participants were explained about the research and their verbal consent was taken. A questionnaire was then filled by a doctor after obtaining information from patients through a face to face interview. The questionnaire required demographic details of participants to be collected such as age, gestational age, socio-economic status, educational level and living status. Patients with previous history of psychiatric illness and ones with intrauterine demise were excluded from study.

Mental disorders such as depression, anxiety and stress also have an impact on sleep pattern. Two groups of participants were defined according to insomnia severity index as insomnia group (total score ≥ 8) and non-insomnia group (total score < 8). Each item in this index was rated on 0-4 scale and total score ranged from 0-28. The insomnia severity index was used to measure the severity of insomnia. Each item was rated on 0-4 scale and the total score ranged from 0-28. High score suggested severity of insomnia symptoms. A total score of ≥ 8 was considered as having symptoms of insomnia

Depression, anxiety and stress scores were calculated by DASS-21 scoring scale[9]. Each item was rated from 0-3 and mild, moderate and severe categories were defined. Depression symptoms scoring was done as minimal/ none (0-9), mild (10-13), moderate (11-20),

severe (21-27) and extremely severe as 21+. Anxiety was scored as minimal/ none (0-7), mild (8-9), moderate (10-14), severe (15-19) and extremely severe as 20+. Stress scoring was minimal/ none (0-14), mild (15-18), moderate (19-25), severe (26-33) and extremely severe as 34+.

Statistical analysis was performed using SPSS 23. Descriptive statistical analysis was performed. Comparison of demographic data and other psychological variables of depression, anxiety and stress were done between insomnia and non-insomnia group. Chi square was used and p- value of < 0.05 was considered statistically significant.

Results

A total of 310 pregnant women participated in this survey. Symptoms of depression were found in 184 (64.33%), anxiety in 228 (76%), stress in 88 (29.3%) and insomnia in 223(74.3%) patients.

Table-1 is showing comparison of demographic features of insomnia and non-insomnia group. It indicates that individuals of insomnia group were mostly in range of 18-25 years age (53.81%). A comparison between insomnia and non-insomnia group indicated that individuals with lower socio-economic status had statistically significant insomnia 119 (53.36%) versus 33(37.93%) in non-insomnia group (p<0.05). Similarly, illiterate women had higher rate of insomnia 112(50.2%) versus 36(41.3%) in non-insomnia group. Insomnia was most pronounced in first pregnancy, third trimester of pregnancy and those living in joint family.

Table-II is showing the correlation between insomnia and other psychiatric disorders. Depression, anxiety and stress was significantly associated with insomnia (p<0.001)

Table-III shows the concerns of patients about the spread of disease to baby. 273(88.06%) of women perceived that COVID-19 can be transmitted to baby in intrauterine life and 214(69.03%) thought that it can either cause intrauterine demise or infection in new born baby if mother had COVID-19 infection.

Discussion

Pregnancy is a stressful condition for women due to

hormonal and physical changes. Anxiety and depre-ssion is a commonly reported symptom in pregnant patients due to worries about perinatal outcome. Generalized anxiety disorders are estimated to be present amongst 8.5% of pregnant population.[10] This study revealed that anxiety and depression were pro-

FIGURE-1: FREQUENCY OF PSYCHOLOGICAL SYMPTOMS
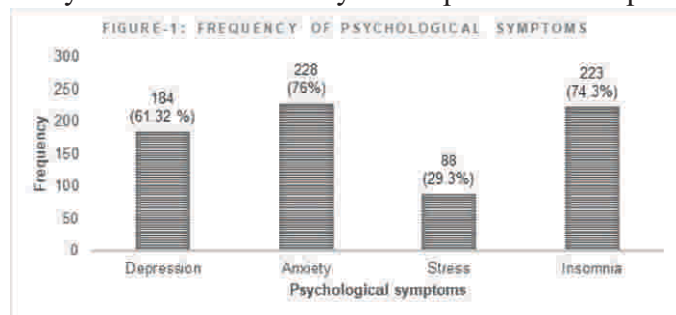
Table 1: *Comparison of Demographic Features between Insomnia and Non-Insomnia Group*

Demographic data		Insomnia N=223	Non Insomnia N=87	P value
Age	18-25year	120 (53.81%)	40 (45.977%)	0.601
	26-30year	82 (36.77%)	36(41.37%)	
	31-35year	14(6.27%)	8 (9.19%)	
	35 above	7 (3.13%)	3 (3.44%)	
Educa-tion	Illiterate	112 (50.2%)	36 (41.37%)	0.08
	elementary	77(34.52%)	38 (43.67%)	
	Matric/FA	23 (10.3%)	7 (8.04%)	
	Graduation/above	11(4.93%)	6(6.89%)	
Socio-economic status	Poor	119 (53.36%)	33 (37.93%)	0.05
	Middle	98 (43.94%)	51 (58.62%)	
	High	6(2.69%)	3 (3.44%)	
Gesta-tional age	1st trimester	37 (16.59%)	9 (10.34%)	0.43
	2nd trimester	73 (32.7%)	42 (48.27%)	
	3rd trimester	96 (43.04%)	31 (35.63%)	
	postpartum	17(7.62%)	5 (5.74%)	
Living status	Nuclear	58(26.01)	26 (29.88%)	0.49
	Joint	165(73.99%)	61(70.11%)	
Parity	Primigravid	102(45.73%)	32(36.78%)	0.153
	Gravida 2-4	71(31.84%)	35(40.02%)	
	> G4	50(22.42%)	20(22.98%)	

Table 2: *Correlation between Insomnia and Other Psychiatric Disorders of Study Population*

Mood status		Insomnia N=223	Non Insomnia N=87	P value
Depre-ssion	No	36(16.14%)	80(91.95%)	<0.001
	Mild	77(34.52%)	6(6.89%)	
	Moderate	90(40.35%)	1 (1.14%)	
	severe	20(8.96%)	0 (0%)	
Anxiety	no	10(4.38%)	62(%71.24)	<0.001
	Mild	39(17.48%)	16(18.39%)	
	Moderate	92(41.25%)	9(10.34%)	
	severe	82(36.77%)	0(0%)	
Stress	No	126(56.50%)	86(98.85%)	<0.001
	Mild	82(36.77%)	0(0%)	
	Moderate	13(5.82%)	1(1.14%)	
	Severe	2(0.89%)	0(0%)	

Table 3: *Fears and Perception of Pregnant Women about COVID-19.*

	Yes	No
worried about transmission to baby N=310	273(88.06%)	96(30.96%)
worried about bad outcome for baby N=310	214(69.03%)	37(11.93%)

nounced psychological symptoms in pregnant population regarding COVID seen in 75.2% of patients. Other studies report similar results with increased stress levels among pregnant women after corona as compared to pre COVID days.[11,12] Corona Virus had devastating effects on human psyche with daily inpouring news of mortality and spread across borders. Various conspiracy theories circulated that doctors are killing people visiting the hospital. Social media pictures of mass graves, deserted streets, people confined to homes and economy collapse all added to stress. This particularly affected the preg-nant women who were already prone to anxiety because of pregnancy. COVID during pregnancy is known to cause preterm labour and increased chances of fetal distress although no increased miscarriage rate is reported.[13] All this uncertainty led to false beliefs of adverse pregnancy outcomes. Lockdown policy refrained women from travel to hospitals and consult doctors which further increased her worries. Moreover they were worried of transmission to their existing children and families in case of their own infection. Looking after household work if advised home isolation was another point of concern.

Depression and anxiety have correlation with sleep disturbances which is evident in our study showing insomnia in 74.3% of patients. Although insomnia is a feature which can develop during pregnancy and its frequency increases with increasing gestational age.[14,15] Anxiety, stress and depression can compound sleeplessness which further adds to stress. Our study shows significant association of depression, anxiety and stress with insomnia. Anxiety during pregnancy is associated with higher risk of preterm labour and low birth weight of babies.[10,16] It is also associated with impaired fetal cognitive development and increased chances of postpartum depression. Preg-nant patients mental health services is an important duty of government and health care professionals. Urgent need of psychological support to pregnant women was emphasized in study from China for better perinatal and maternal outcome.[17] Communi-

cation through telemedicine, online clinics with particular emphasis of evidence based information can allay their fears and improve pregnancy outcomes.

The women who were illiterate and belonged to poor socio-economic status were more prone to insomnia and psychological disorders. Illiterate people are more prone to believe rumors as their ability to analyse situation of disease is limited and they do not take proper preventive measures. Socioeconomic status of public was worsened due to lockdown which aggravated the psychological distress of patients. Patients living with joint family also had more insomnia with fears of transmission to children and elderly of family. We fail to address psychological health of the pregnant patients as we are busy in dealing with their obstetric issues. This study highlights high prevalence of psychological stress linked to insomnia in pregnant patients. Sleep disturbances can be corrected by nonpharmacological intervention of sleep hygiene, education and advising cognitive behavioral therapy for insomnia[18]. Mental health professionals should be an essential part of team with counselling sessions for the pregnant patients in this pandemic. These sessions are also important for health care professionals involved in care of pregnant women. Proper and timely counselling in such patients can reduce anxiety and fears and hence can lead to better pregnancy outcome.

Our study showed that a considerable number of patients believed that the disease is transmitted to the baby and majority of them thought that baby can have adverse outcome. Similar perceptions has been reported by other studies from Pakistan.[7,8] Initial studies reported controversial findings with reports of vertical transmission.[13,19] Mother anxiety is compounded when she believes that her baby is going to suffer the disease which doesn't have a cure. Latest studies with more data have shown that there is no vertical transmission of COVID-19 from mother to baby[20-22]. The high false perception rate in study participants may be related to rumors on social media and lack of conclusive evidence. Things will get better when more data is gathered. It is part of duty of health care professionals to guide these women properly. Evidence based guidelines for proper communication of information should be formulated. They should be advised to minimize listening to news about COVID-

19, have link with supportive groups through social media and practice regular light exercises. Awareness should be created in public regarding prevention strategies and psychological health of pregnant patients and low probability of vertical transmission.

Conclusion

Pregnant women suffer from psychological distress during this COVID-19 pandemic and have perceptions that maternal infection can adversely affect babies by vertical transmission. Adequate counselling sessions by obstetricians and mental health professionals are needed to eliminate these false perceptions and relieve psychological stress.

Authors Contribution:
TW: Concept and Final Proof Reading
MW: Data Analysis
GR: Discussion Writing
NB: Initial Drafting
JM: Data Collection

Conflict of Interest: None

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Experience of Tocilizumab in Patient of Severe COVID-19

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Abstract

Objective: Covid-19 widespread pandemic leading to more than 800 thousand deaths. ARDS remains leading cause of death. Cytokine release syndrome like phenomenon was observed as important contributory factor for death and IL-6 inhibitors showed promising results in multiple case series. We share our experience of Tocilizumab in patients with very severe COVID-19.

Methods: In this prospective non-randomized cohort study conducted in COVID-ICU SIMS/SHL; patients who were given one or two consecutive doses of 400 mg Tocilizumab IV or subcutaneously after fulfilling criteria (Ferritin>700, CRP>70, D-Dimer>1000, FiO2 >10L, pulmonary infiltrates or worsening status) were included. Patient's data was noted on proforma. Patients were given standard treatment including IV dexamethasone, azithromycin and broad spectrum antibiotic, Invasive or non-invasive ventilation and proning from day one.

Results: Twenty one (M=19, F=2) patients having severe or very severe Covid requiring invasive ventilation 17(81%) and non-invasive ventilation 4 (19%)were given Tocilizumab (400mg two doses) along with dexamethasone, antibiotics and general care. Average age was 58.9 + 7. Majority of the patients were below 65 years. Out of 21 patients 4 patients improved and 3 discharged 1still admitted, mortality 81%(n=17). Raised inflammatory marker like CRP, Ferritin, D-Dimer and LDH and these improved after tocilizumab while Oxygen requirement doesn't improved significantly in majority of patients (n=20,95%)apart from 4 patients who improved gradually over next 7-10th day.

Conclusion: In very severe, steroids refractory COVID-Related ARDS Tocilizumab doesn't showed statistically significant improvement in outcome.

Key Words: COVID-19, Cytokine release syndrome, ARDS, Tocilizumab

Introduction

Coronavirus disease 2019 (COVID_19) was initia-lly detected in China in December 2019 and was declared a global pandemic on March 11, 2020 by WHO[1]. It has effected more than 23 million people with more than 0.81 million deaths across the world. Covid related knowledge including clinical presentation, diagnostics and management improved gradually. Now clinical spectrum of this illness ranges from asymp-tomatic infected to life threating acute respiratory distress syndrome (ARDS), circulatory shock, multi organ failure.[2,3] Apart from respiratory system it invol-ved GI, CNS, Musculoskeletal and cardiovascular systems. It remained main burden of hospitalization all over the world and hypoxia was the main reason for hospital admission creating massive demand for invasive ventilation an intensive care unit beds in a short period.[4,5]

Treatment strategy evolved over time started from antivirals (oseltamivir, lopinavir/ritonavir), antimala-rial (Hydroxychloroquine, primaquine), anti-parasi-tic (Ivermite) various antibiotics (azithromycin, ceftriaxone, PIPTAZ, Meropenem) and changed to Remdesivir, dexamethasoneand IL-6 inhibitor with variable benefits. Currently, the standard of care is supportive therapy and there is an urgent need for effective treatment against COVID_19.

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ARDS is the leading cause of mortality in COVID_19 patients and extensive release of pro-inflammatory cytokines is suspected to contribute to poor outcomes in some patients.[6,7] It was hypothesized looking at various inflammatory markers that a cytokine release syndrome (well-established phenomenon in post chemo patients) is the reason for increased mortality in patients of severe covid. This was supported by raised IL-6 levels and various case reports of significant improvement in oxygen demand, need of ventilation and mortality by using IL-6 inhibitor Tocilizumab (interleukin-6 (IL-6) receptor antagonist).

Endogenous IL-6 is induced by inflammatory stimuli and mediates a variety of immunological responses. Inhibition of IL-6 receptors by tocilizumab leads to a reduction in cytokine and acute phase reactant production. Other drugs Siltuximab (direct IL-6 antagonist) Sarilumab, Lenzilumabare also used for treatment of cytokine release syndrome. This study is conducted to share our experience of Tocilizumab in severe covid patients.

Methods

This study was conducted in COVID-ICU SIMS/SHL Lahore. We included all patients who were given tocilizumab in our ICU during April to August 2020. As a policy Tocilizumab was given to the patients fulfillingcriteria (table 1) and approved by the designated 4 member committee including intensivist, pulmonologist, medical physician and Pharmacist.

After excluding contraindications for tocilizumab (TB, Invasive Fungal infection or sepsis) we gave two doses of 400 mg Tocilizumab IV/Subcutaneously. Patients were followed for adverse effects, special labs, oxygen requirement or radiological improvement till discharge or death. In our ICU all patients were given dexamethasone 4-8mg IV twice a day for 14 days and can be reduced on patient improvement, Azithromycin 500 mg or Moxifloxacin 400 mg OD if intolerant to azithromycin along with broad spectrum antibiotic like PIP+TAZ or meropenem. We didn't gave HCQ but gave Ivermactine initially and Remdesivir if available.

All patients were managed by Oxygen with FM (Face Mask), NRM (Non-Rebreather Mask), NC+NRM according to oxygen increasing requirement respec-

Table 1: *Criteria for Tocilizumab Administration*

Any one criteria	+Any one Sign	+ Any of two labs
Age >60	Fever >39~C (102~F)	Ferritin levels >700
Cardiomyopathy	Hypotension	CRP>70
ESRD/Organ transplant	>10L Oxygen requirement with FM	D-Dimer level >1000
Lung Disease	R/R >30	
Age <60	As Above	Any 2 of above
Worsening Pulmonary infiltrates and worsening hypoxia		

tively. We also used HFNC alone or combined with NRM and CPAP with Face mask via ventilator with 100% FIO in resistant hypoxia and encourage all patients for proning.Patients not improving with NIPPV were ventilated. Data was analyzed by SPSS 19.0.

Results

A total of 21 patients were given Tocilizumab including 19 male and 2 females. Average age was 58.9 + 7. Distribution of age, gender, time to presentation to hospital, time to tocilizumab administration and ICU stay is given in table number 2.

Majority of the patients were below 65 years (76%, n=16). Almost all of the patients had very severe Covid (n=19, 91%)evident by severe hypoxia with high oxygen requirement,>50% lung parenchymal infiltrates and markedly raised inflammatory markers. Only 2 patient had 5L oxygen requirement with Face mask on admission and 7-10L on day of Tocilizumab administration.

Among 21patients patients improved and discharged 1 patient improving but still admitted, mortality 81%(n=17). Oneout of 3 patients discharged; expired after 3 weeks due to acute worsening of dyspnea possibly due to ACS or Pulmonary Embolism. All patients had raised inflammatory marker (CRP, Ferritin, D-Dimer, LDH) and these improved after tocilizumab but Oxygen requirement doesn't improved significantly after Tocilizumab in majority of patients (n=20,95%) in 1st week. Exception was 4 patients who improved over next 7-10th day. In one patient with relatively mild disease oxygen requirement improved on 3rd day and he was discharged on 7th day. A total of 17 (81%) patients required ventilation, 6 (28.5%) patients were put on ventilation before tocilizumab administration while 11 required invasive ventilation after tocilizumab due to worsening

hypoxia. All of ventilated patients expired and detail along with co-morbitiesis given in table 2.

There was significant interval between start of symptoms and ICU admission 5-7 days (13) and 8-15 days in 8 patients. Majority of patients received Tocilizumab within 48hours of admission and got 2 does of 400 mg each. Three patients got single dose one got Anuria followed by renal shutdown requiring renal replacement therapy and later she expired, other

Table 2: *Demographics, hospital admission, stay, comorbidities admission hypoxia of total patients is given along with number of patients who survived in each category in given in red on right column. These patients had less severe disease and didn't required ventilation.*

Parameter	Total Number (%)	Survivor (number)
Age	**58.9+7**	
<50	4 (19%)	1
50-60	8 (38%)	2
60-70	6 (28.5%)	1
>70	3 (14.3%)	
PCR +ve	**16 (76%)**	4
Sx. to Admission (day)	**8.1+2**	
5-7	13 (61.9%)	2
8-10	04 (19%)	
11-15	04 (19%)	2
Admission to Toci (Days)	**2.6 +0.7**	
1-2	12 (57.1%)	2
3-5	07 (33.3%)	1
6-10	02 (9.5%)	1
Sx. To Toci (Days)	**10.48+3**	
Admission FiO2 Required		
5L FM	1 (4.7%)	1
10-15L NRM	7(33.3%)	3
20-25L NRM+NC	13(61.9%)	
Radiological Involvement		
>50% parenchyma	21(100%)	4
Co-Morbidity		
HTN	10 (47.6%)	3
DM	6 (28%)	1
IHD	6 (28%)	2
COPD/Asthma	4 (19%)	1
Nil	7 (33.3%)	1
Ventilation		
HFNC/CPAP	4 (19%)	4
IPPV	17(81%)	0
Post Toci Hospital stay		
1	1(4.7%)	
2	3(14.3%)	
3-5	7 (33.3)	1
6-10	2 (9.5%)	
11-20	4 (19%)	
>20	4 (19%)	3

two patients expired after 1st dose. Inflammatory markers were raised in all patients and these improved too after tocilizumab administration (Graph:1) but survivors had comparatively less raised markers favoring a direct correlation.
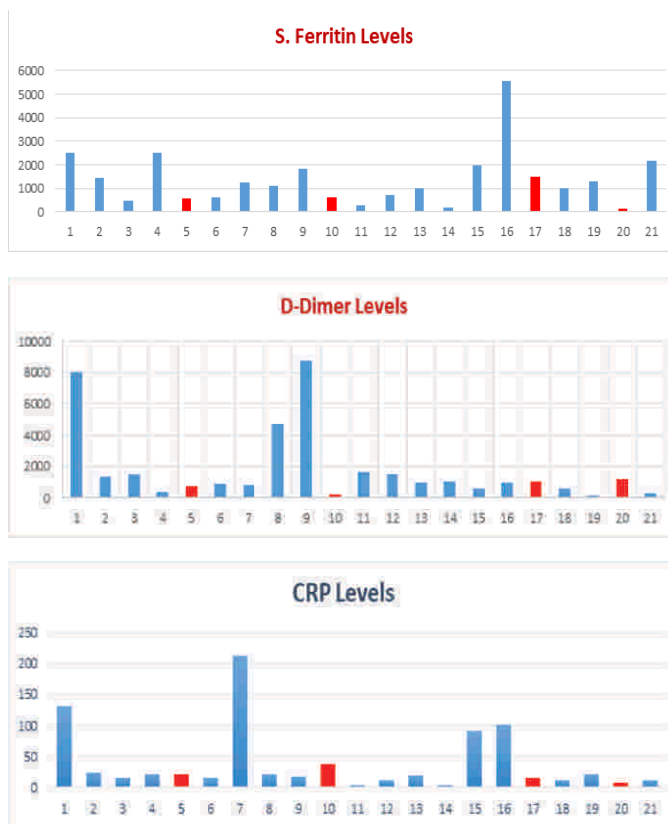
Graph 1: *Comparative Values of CRP, D-Dimer and S. Ferritin Levels for all Recipients of Tocilizumab. Highlighted in Red Color are the Survivors Who were Discharge. Low Levels of Inflammatory Markers is Evident in this Subset*

Discussion

Covid-19 is new pandemic who spread vastly unlike previous corona related epidemic; SARS inn 2002 and MERS 2012. The knowledge about disease spread, effected organs, management and mortality is emerging and we are learning every day. We are reading multiple articles with different and conflicting results, making decision making difficult for the treating physicians. But few points are evident for the data that ARDS is the most fatal and prevalent implication followed by cardiac and renal involvement. Aged with multiple co-morbidities, with high viral load and late presenters has high mortality.

A subsets of patients who developed acute worsening of hypoxia, persistent fever and hypotension was

consider to have cytokine release syndrome like phenomenon due to raised inflammatory markers. Cytokine release syndrome is frequently associated with chimeric antigen receptor (CAR)-T cell therapy in B- cell malignancies. Itoccurs when large numbers of white blood cells are activated and release inflammatory cytokines, which in turn activate yet more white blood cells. CRS is also an adverse effect of some monoclonal antibody medications, as well as adoptive T-cell therapies.[7,8] Its clinical spectrums varies from mild fever and tachycardia to life threatening ARDS and shock grade as 1-5 according to Common Terminology Criteria for Adverse Events classifications for CRS as of version 4.03 issued in 2010[9]. Most the times it improves with Steroids and few cases required IL-6 inhibitors for steroid refractory cases.

Tocilizumab showed improved outcome in patients of COVID in case reports, small studies and few case control trials as compared to other drugs like HCQ, Azithromycin,[10] antivirals both in ventilated and non-ventilated patients.[11,12,13] But in these studies steroids weren't used.

In our study relative younger age group with less co-morbidities showed good outcome that is same for most of the studies.[14,15] The prognosis also depends on severity of disease as all patients who survived had less severe disease (5-10L FiO_2) and doesn't required ventilation. As contrast to other studies we don't observed significant reduction in oxygen requirement post tocilizumab and those of who improved had longer hospital stay 20 days on average. This phenomenon may be due to selection of the patients as we gave tocilizumab to very severe cases with full blown ARDS and worsening clinical status despite of steroids. As steroid can treat and delay the cytokine release storm those who doesn't improved with steroids they didn't improved to tocilizumab. This question will remained unanswered till a RCT with head to head comparison of tocilizumab with steroids done. Short comings of our study is a control group and small sample size with single center data. Large trial with multicenter data will answer many question and help is decision making.

Conclusion

In very severe, steroids refractory COVID-Related ARDS Tocilizumab doesn't showed statistically significant improvement in outcome.

Authors Contribution
1. **MH:** Study design, data collection, manuscript writing, data analysis and patients care.
2. **KKC:** Study design, manuscript writing, data analysis and patients care.
3. **MG:** Radiological input, data collection, results
4-6: **DR, ZK, MM:** Data Collection

Conflict of Interest: None

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Out Break of COVID-19_____Traits after Entry in Pakistan

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Abstract

Background: Since the first case of novel coronavirus disease (Covid-19) detected and spread from Wuhan, China, continuously it is spreading globally and simultaneously in Pakistan. This study has analyzed 200 cases of Covid-19 positive to determine epidemiological and clinical traits of Covid-19 entry in Pakistan.

Methods: These patients were present/transferred from Taftan city to Quetta health center of Balochistan. Basic information for Covid-19 on its clinical, laboratory investigations, epidemiology, diagnosis and treatment were obtained. Further these initial traits were compared between severe, mild, respiratory distressed and asymptomatic cases. Ratio of Covid-19 spread and its mortality also compared with other provinces.

Observations: By the end of the month of March 2020, 200 patients were assessed and analyses for various outcomes of the Covid-19 infection. These patients were present in various health centers of Quetta. Among these 200 cases, 27 (13.5%) were severe, 173 (86.5%) were other cases including mild, respiratory distressed and asymptomatic. Median age group of all cases was 34.9 years. 86.5% were male patients. Maximum number of patients (54.5%) was from Sindh province and least was from Kpk (00) in these quarantine centers of Quetta. 70.5% of all cases have confirm contact history. Commonly occurring symptoms at onset of illness were mild pyrexia (82%), high grade fever (16.5%), cough (54.5%), body ache (38.5%), and dyspnea (10.5%). No patient has any travel history of China while 68.5% patients had a travel history of Iran. In this study the Covid-19 infected positive cases who got discharged from hospital after one visit was 30%. Patients who got hospitalized for admission due to infection were 65%. Total 04 (2%) deaths occurred in these 200 Covid-19 positive cases.

Interpretation: This study explained the severity of Covid-19 infection after its entry in Pakistan and its spread from outskirts to health centers of Quetta. Initial admission, laboratory tests, management and treatment all leads towards a better protocol to handle and prevent the Covid-19 infection spread in other provinces of the country. Early isolation and quarantine for close contacts and strictly following SOPs (standing operating procedures) can give better and safe results for future.

Keywords: Covid-19, Traits, Quetta

Introduction

Alarming total number of 40,500 confirm cases of Covid-19 positive had been identified in the world in 1st week of February 2020, accounted by World Health Organisation WHO.[1] Out of these confir-med cases of Covid-19, 4000 had been discharged from hospitals, 1016 died and 88% remained in various hospitals of China.[2] Global Covid positive cases were also seen in many countries across Europe and US including South East Asia.[3] Wuhan, China was the main focus of Covid-19 pandemic when this outbreak was spread rapidly. Current research has featured Covid-19 characteristics mostly occurred in Wuhan while these features were not given special attention in many countries.[4-5] In current study, the data which has analyzed, purely depended on the features of those Covid positive patients received in various quaran-tine centers of Quetta Pakistan specially

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bordered with Iran. Initial influx was in the month of March-April 2020. Asymptomatic, mild and sever cases of this pandemic noticed in various centers of Quetta city. How far this outbreak gave lessons to health staff, community and management team in comba-ting Covid-19 infection spread.

Methods

This was a study, designed to search for the features and traits among those patients who get positive with Covid-19 infection transferred from Iran border quarantine centers to health centers of Quetta specia-lly made for Covid patients. 200 patients tested for covid-19 infection in Fatima Jinnah Hospital with positive results are added for this study. Symptomatic characteristics and traits in between mild, severe and confirmed to asymptomatic or without pneumonia compared and observed. Approval was taken from ethical committee of BUMHS.

The patients of Covid-19 infection were enquired for epidemiological, clinical, laboratory tests and self explanations. Regarding covid-19 problem, the laboratory authentication of Covid-19 infection was detected in Fatima Jinnah Chest Hospital Quetta on PCR. Clinical findings were also followed during in or quarantine period of patients. During stay of patient in Taftan (city bordered with Iran), its history asked from medical staff at that quarantine base or relative/companion of patient. The extracted data reviewed by two independent reviewers by using double extraction method. All data was checked by four reviewers. Data on covid-19 obtained from all health centers were administered by Health depart-ment of Balochistan.

The variables used to express were mean and SD. The

Table 1: *Features of COVID-19 in Balochistan*

Features	Total cases (n=200)	Severe cases (n=27)	Mild, Moderate, asymptomatic cases (173)	p-value
Average Age years	34.9	60	57.1	<0.001
Age in groups(%)				
1-15	04(2)	00(0)	04(2)	
16-30	71(35.5)	01(0.5)	70(35)	
31-50	90(45)	03(1.5)	87(43.5)	
51-65	23(11.5)	04(2)	19(9.5)	
>66	12(6)	07(3.5)	05(2.5)	
Male n. %	173(86.5)	11(5.5)	162(81)	0.752
Female	27(13.5)	04(2)	23(11.5)	<0.001
Resident province n %				
Azzad Jamu Kashmir	01(0.5)	00(0.0)	01(0.5)	
Balochistan	57(28.5)	13(6.5)	44(22.0)	
Gilgit Baltistan	00(0.0)	00(0.0)	00(0.0)	
Punjab	33(16.5)	07(3.5)	26(13.0)	
Sindh	109(54.5)	07(3.5)	102(51.0)	
Kpk	00	00	00	
Sign & Symptoms n %				
Mild pyrexia	164(82)	17(62.9)	145(83.8)	0.621
High grade pyrexia	33(16.5)	07(25.9)	21(12.1)	0.572
Cough	109(54.5)	07(25.9)	102(58.9)	0.103
Body ache	77(38.5)	21(77.7)	154(89.0)	0.181
Dyspnea	21(10.5)	03(11.1)	11(6.3)	<0.001
Contact history n %	141(70.5)	27(100)	103(59.5)	0.322
Travel from China	00(0.0)	00(0.0)	00(0.0)	
Travel from Iran	137(68.5)	17(62.9)	120(69.3)	0.070
Contact to positive case	29(14.5)	11(40.7)	21(12.1)	0.210
Days of illness onset	6.3±4.9	7.6±6.7	6.3±5.1	0.313
Days from illness to hospital visit	3.7±2.9	2.9±2.1	4.2±3.7	0.199
Outcome of cases n %				0.001
Discharge after 1st hospital visit	60(30)	00(0.0)	41(23.7)	
Patient hospitalization	130(65)	27(100)	112(64.7)	
Death	04(02)	03(11.1)	01(0.5)	

data (categorical variables) were explained as percentage and analyzed by using Wilcoxon test. Analysis performed with SPSS-22 and p-value lesser 0.05 was statistically significant

Results

To explore the COVID-19 entry in Pakistan, its infection rate and traits, 200 confirmed cases of Covid-19 positive were added in this study. These cases were transferred from quarantine center of border city Taftan to various COVID centers at Quetta. Out of these 200 cases, 27 (13.5%) were severely ill and 173 (86.5%) were categorized as common cases. Emergency aid of oxygen support given to severely sick patients after observation of oxygen saturation (65%-80%). Continuous supply of oxygen for three consecutive days given to various ill patients making the saturation 92%-96%. Few common cases required oxygen management too. The common cases included mild, moderate and asymptomatic individuals. The median age of the patient was 34.9 years (from 01 year to 84 year. Age 1 to 15 years children were 04 (2%), COVID-19 infected age group between 16 to 30 years was 71 (35.5%). Total number of patients was 90 (45%) of all infected cases from 31 to 50 years. Age from 51 to 65 years had the median age of 23 (11.5%) and more than 60 years of age group remained 12 (6%) cases of all infected COVID patients, (Table-1) (Figure-1). Total number of male patients in this study was 173 (86.5%) while females were 27 (13.5%). Various COVID health centers of Quetta received number of patients. These patients were belonging from all over the country. One (0.5%) patient was from province of Azad Jammu Kashmir, 57 (28.5%) patients were from Balochistan province, No any patient was from Gilgit Baltistan. From Punjab province 33 (16.5%) patients got COVID infection in health centers, while 109 (54.5%) patients were from Sindh province. No any patient was from KPK province. Pyrexia was most commonly observed symptom in most of the patients 164 (82%), high grade fever 33 (16.5%), cough 109(54.5%), body ache 77(38.5%), dyspnea 21 (10.5%) were other symptomatic mani-festations seen in these infected patients. 141 (70.5%) patients got positive for COVID-19 infection having a contact history with other positive patients. No any patient have been noticed who have recent or near past traveling history to China. Most patients had a recent traveling history of Iran. Some were pilgrims and business individuals while rest were students. COVID-19 pandemic hit very hardly to Iran killing dozens daily which resulted transfer of many positive patients through Taftan gateway into Pakistan. No arrangements to quarantine this massive influx of
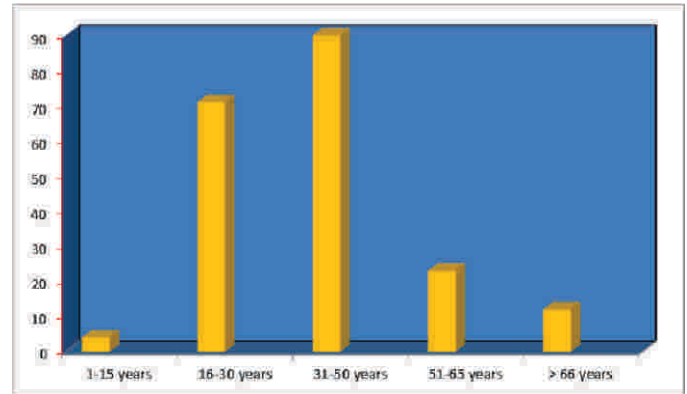
patients caused immense difficulties for management and medical staff as well.

Fig-1 *Age in Years of COVID-19 Infected Patients*

Illness onset and duration of stay in hospital was also noticed in this study. After appearance of any symptom out of these 200 patients 60 patients (30%) visited the hospital where they had a check up and discharged later after getting minor treatment. Among these patients all sever sympto-matic patients got admitted in hospital. 41 patients (23.7%) had minor symptoms during hospital visit and discharged later after treatment. 130 patients (65%) got admitted in hospital after looking at the severity of symptoms. All those 27 patients (100%) who got severe symptoms of COVID-19 got admitted in hospital where 3 patients (11.1%) died due to complications and severity of symptoms. All those who died were more than 65 years of age. One patient (0.5%) who had minor symptoms but worsened later at home died in hospital due to poor management at home. First case of COVID-19 infection in Pakistan noted on 26.02,2020. First 50 cases observed on 16.03.2020, 187 cases (253% increase) seen very next day on 17.03.2020. 241 cases noted on 18.03.2020 while first death due to outbreak in Pakistan seen on 19.03.2020. First 1000 cases noted on 26.03.2020 where at this stage death toll reached 08. The fatal outcome of Covid pandemic remained very low in Quetta compared with other cities of Pakistan. Quetta was the most positive case holding city in the month

of March, reduced later day by day. Current figures of Covid-19 positive cases in various provinces of Pakistan remained as, Sindh 128000, Punjab 96057,
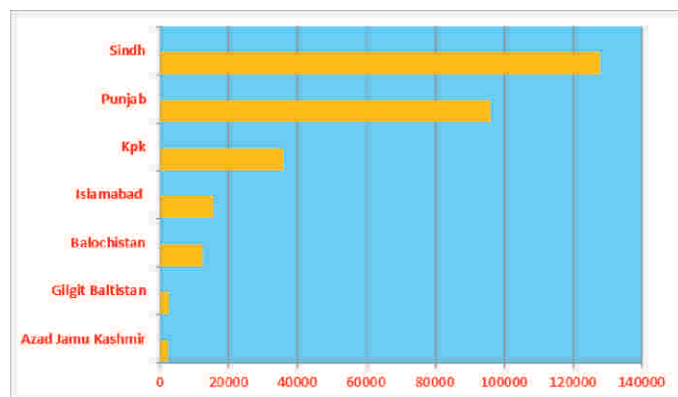
KpK 35602, Islamabad capital 15472, Balochistan 12472, Gilgit Baltistan 2638 and Azad Jamu Kashmir 2241.

Fig-2: *Number of COVID-19 Cases according to Provinces*

Discussion

The corona virus outbreak has an experience started in China via SARS in 2003. The dormant coronavirus turned in a pandemic from Wuhan in December 2019.7 Dr. Drazen of NEJM exclaimed that when tackled by a regular rival, all should forget differences and work jointly for eradication of enemy. This vital lesson conferred during combating SARS with the hope for any gain.8 The recent pandemic of corona virus infection started in Wuhan China and spread globally. Comparison of asymptomatic and mild cases to severe and mortal cases is still mysterious which obstructs pragmatic estimation of corona virus outbreak and obscure the occurrence reaction.[9] This study explored the fraction of severe cases of covid-19 to common cases of corona virus infection which was around 1:6, the ratio of severe cases to asymptomatic and mild respiratory distress were 1:20 and 1:15 respectively. 09 asymptomatic covid-19 positive cases were in close contacts of severe cases as they all would not look for health care hospital visit and can stretch infectivity to other close contacts.[10] The prevention of corona virus disease spread and its control are important measures to be taken for future. Majority of Covid-19 positive patients were adults while males were 86.5% of all patients showing significant difference between male and female patients. The cases steadily increased from the month

of March 2020 with an abrupt elevated number at the end of month. The reason behind this was mode of fast transmission route from person to person. Common presentation of illness was fever, body ache and dyspnea but dyspnea was always accompanied with severe distressed patients. The same pattern was noted in the patients of Wuhan China.9 Incubation period was 6.7 days. Patient fatality due to Covid-19 infection was 13.5% which is higher initially than the other provinces. Abrupt increase in Covid-19 infected patient's influx observed initially in Quetta Balochistan compare to rest of the country which has fallen faster in later days. Therefore Balochistan was successful in preventing and handling the Covid-19 outbreak. From the perspective of death due to Covid-19 pandemic, this was 3.5% while at the end of March this was about 39.5% in rest of the country. Almost no fatality noted in the province of Balochistan during Covid-19 outbreak beginning days.[11] This study has few limitations, during initial stages of quarantine, most of those suspected groups clustered in bulk without caring the SOPs. There was forceful exit immigration by Iran Government pushing the suspected Covid-19 patients into Pakistan. Proper quarantine places were not made by provincial management in beginning days of pandemic. PCR testing facility is not available in Taftan. Initial reaction time by health ministry and medical staff deployment to quarantine and health facilities was very poor. The official data of Covid-19 pandemic is exhibited almost a month late. PCR testing facility was started very late in prescribed health centers of Quetta. The pandemic development curve of this study is not specified. This study represents initial pattern of Covid-19 spread in Quetta, which has definite worth for future deterrence, control and research. Concluding the study with the traits of Covid-19 infected patients in Quetta Balochistan were appa-rently unusual from other provinces of Pakistan in low fatality, high discharge rate and decrease in new Covid-19 positive patients.

Authors Contribution:
ZK: Study design, Statistical analysis, protocol, first draft of manuscript.
MM: Statistical Analysis, Protocol, first draft of manuscript.
MYB: Statistical analysis
AZK, MH, NA, HS: Data Collection

Conflict of Interest: None

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Behavioral and Emotional problems in children with Pre-existing Psychiatric and Neurodevelopmental Problems during COVID-19 Pandemic

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Abstract

Objectives: The present study aimed to explore the prevalence of various emotional and behavioural changes associated with the COVID-19 outbreak experience on children with pre-existing psychiatric or neuro developmental illness.

Methods: Following ethical approval, data was collected in July-August, 2020. Parents of children receiving treatment from child mental health services in a tertiary care hospital were contacted and a structured questionnaire was used to collect data on emotional and behaviour changes noticed in their child, impact on daily routine and educational activities since the lockdown. Data was analyzed by SPSS-26.

Results: parents participated. The Mean age of children was 8.67 + 4.25 and 59% were male. Neurodevelopmental disorders and emotional problems were the predominant diagnoses in children. A significant proportion of parents (143; 63.6%) noticed changes in their children's emotional state and behaviors during the lockdown. Two-thirds of the parents believed that their child's anger has worsened during lockdown with increased likelihood of getting into arguments with family (49.8%), more behavioural problems (43.1%), and being more irritable (39%). Every fourth parent reported worsening anxiety and nervousness in their children. Majority of parents mentioned disruption in children's routines with increased screentime and less physical activities and adverse impact on educational activities. 35% parents admitted to feeling stressed and facing difficulties in managing their children's behaviour in the prevailing situation.

Conclusions: Significant worsening of emotional and behavioural problems was noted during COVID-19 outbreak among children with preexisting psychiatric problems. Policies should take into consideration the implications of the lockdown for this most vulnerable group and supportive interventions for the immediate and the future should be promoted.

Key words: COVID-19, neurodevelopment; child and adolescent psychiatry; mental disorder; children.

Introduction

The COVID-19 pandemic has impacted the mental and physical well-being of people across the globe.[1] A particular population at risk of psychological morbidity is the children who rely on schools and out-of-home interactions to fulfill their social drives and groom their practical skills.[2] As a result, parents have reported increased screen time, agitation, irritability, fear of infection, decreased physical activity, sleep disturbances, and mood and appetite changes in children.[1,3,4,5] Children may develop acute stress disor-der or post-traumatic stress disorder in response to quarantine.[6,7] Multiple studies on children in COVID-19 showed an increase in emotional and behavioral problems.[1,8,9] These psychological effects in children may also manifest as nightmares, clinginess, separa-tion anxiety, or regression.

The effect of COVID-19 becomes even more pronounced in children with any pre-existing psycho-logical or neurodevelopmental morbidity.[10] Closure of schools has led to a loss of a source of learning of their communication and social skills.

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With the closure of hospital outpatients, it becomes difficult to access mental health services, especially in popula-tions living in rural areas.[4] Literature suggests that children with an autism spectrum disorder or intellec-tual disability are at 4 times higher risk of developing psychosis or other psychological morbidities even in normal conditions.[11] Loss of routine and regular therapy services, increased screen time and lack of physical activity due to confinement at home and limited availability of entertainment resources also contribute to psychological problems in these children.[8,10]

Limited literature is available regarding the mental well-being of children with pre-existing psycholo-gical and neurodevelopmental morbidities in the previous pandemics as well as in COVID-19. It is therefore important to assess the prevalence of emotional and behavioral problems in these children. We were unable to find any study from Pakistan which address this topic. To fill this information gap, our study aims to find the prevalence of different emotional and behavioral changes in children with pre-existing psychological or neurodevelopmental morbidity during COVID-19 in Pakistan.

Methods

The study was conducted through July-August 2020. The study was conducted in compliance with the ethical principles for medical research involving human subjects of the Helsinki Declaration and ethical approval was sought from the Institutional Review Board, KEMU. The study sample included parents of children who had one or more children aged<18 years with a history of psychiatric or neurodevelopmental disorder and had visited the Child Psychiatry Department of Mayo Hospital for the treatment of their children in a month before the COVID-19 related lockdown. Contact details were accessed from the departmental database and telephonic interviews were conducted by a trained psychologist. Telephonic Interviews were conducted to limit unnecessary exposure to infection. Informed consent was taken before an interview. Anonymity and confidentiality were ensured. Purposive samp-ling technique was used. Exclusion criteria included parents who did not give consent, and the presence of any language barrier.

A structured questionnaire used by Orgiles et al was used to interview the parents.[1] It had various sections including socio-demographic information form for parents and children, parents' perception of how quarantine is affecting their child, changes in child's routine including screen time and physical activity and information on engagement with educational activities during lockdown. Parental perception of the impact of quarantine on the emotional well-being included 32 questions comprising of themes like anxiety (my child is restless, my child is anxious, my child is uneasy), irritability (my child is irritable, my child argues with the rest of the family), sleep disturbances (my child sleeps little, my child wakes up frequently), appetite changes (my child has no appetite, my child eats a lot), fear (my child is afraid of COVID-19, my child has nightmares, my child is easily alarmed), clinginess (my child is very depen-dent on us), mood changes (my child is angry, my child cries easily, my child has behavioural problems) and regression (my child has shown deterioration/ regression in behaviour and function). All questions were assessed on a 3-point scale ranging from 1-3 where 1 indicated 'less compared to before', 2 indicated 'no change' and 3 indicated 'more compared to before'. Changes in the child's routine included questions about screen time, physical activity, and sleep before and during the lockdown. Educational activity during lockdown was also assessed regarding tuition outside the home, home tuition, teaching by family members, online educa-tion by schools, school assignments, religious education at home, or in mosques (Yes, No).

Data was entered into SPSS-26. Descriptive statistics were done to analyse variables of interest for the study. Data is presented as frequencies and percen-tages. Chi-square was used to assess any significant differences among gender. P-value <.05 was considered as statistically significant.

Results

Two hundred and twenty-five parents agreed to participate. The mean age of children was 8.67 + 4.25 with majority being males (59%) and belonging to urban areas. Almost half of the participants (51.6%) were living in joint family system. Table 1 presents the socio-demographics of the children and their parents.

A significant proportion of parents (143; 63.6%) noticed changes in their children's emotional state and behaviors during the lockdown and school closures and 35% admitted to feeling stressed and facing difficulties in managing their children behaviour in the prevailing situation. The most common changes were that, during quarantine, their children were angrier (67.6%), more likely to get into arguments with family (49.8%), had more behavioural problems (43.1%), afraid to sleep alone(40%), cries easily (41.8), more irritable (39%), more dependent on parents (38.7%) and had more difficulties in concentration (37.3%). Table 2 provides more details

Table 1: *Socio-Demographics of Children and Parents. (N=225)*

Variable			N (%)
Child's Information	Gender	Male	133 (59.1%)
		Female	92 (40.9%)
	Residence	Urban	197 (87.6%)
		Rural	28 (12.4%)
	Diagnosis	Intellectual Disability	60 (26.6)
		ADHD	20 (8.8)
		Autism Spectrum Disorder	07 (3.11)
		Behaviour Problems(Conduct, disorder, ODD)	18(8)
		Conversion Disorder and other psychosomatic presentations	30 (13.3)
		Emotional Problems (Depression, anxiety,OCD etc)	30(13.3)
		Psychosis (Schizophrenia, Acute Psychotic episode)	25(11.1)
		Bipolar disorder	10(4.4)
		Miscellaneous	25(11.1)
Parents Information	Father employment Status	Self Employed	74 (32.9)
		Full time Job	53 (23.6)
		Part-time job	34 (15.1)
		Unemployed	46 (20.4)
		Lost Job due to COVID-19	05 (2.2)
	Mother Employment status	House wife	201 (89.3)
		Skilled Worker	15 (6.7)
		Unskilled Worker	04 (1.8)

ODD, Oppositional defiant disorder; OCD, Obsessive Compulsive disorder.

about the percentage of the parents who noticed emotional and behavioural changes in their children during the lockdown. Chi-square revealed no significant difference between emotional and behavioural problems in gender except that being afraid of

COVID-19 and physical complaints (like stomachache) were significantly higher in females and concentration problems were reported more in boys (P-value <.05). Parents (183; 81.3%) also reported that during the lockdown, their children were spending much more time daily using screens such as (iPads, TVs, mobiles, or computers), spending less time doing physical activity (121;53.8%), however not much change in sleep duration was noted. Among the screens, television and mobile were being used by 42% and 40% of children respectively. Information provided by parents about children educational activities during the lock down and school closure is given in Figure 1.
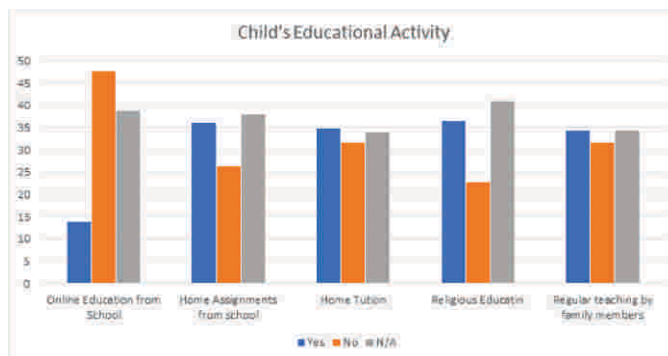
Figure 1: *Children's Engagement in Education during Lockdown among the Sample*

Discussion

According to our knowledge, this is the first study in Pakistan that specifically focused on the psychological effects of COVID-19 Pandemic on the children with pre-existing emotional, behavioral and neurodevelopmental problems. COVID-19 Pandemic has affected almost every human on the globe and children are not immune to the devastating psychological impact of the disease. Mental well-being has suffered a lot during the pandemic due to lockdown and other practices of social isolation. Children with emotional and behavioral problems, in particular, are increasingly vulnerable to the adverse effects of the prolonged social seclusion.

In times of social isolation, it has become increasingly difficult to provide children with positive social interactions to develop behavioral and emotional health.[2] Our results revealed a significant worsening of the behavioral problems during lockdown among children with pre-existing psychiatric problems. Two-thirds of the parents believe that their child's anger has worsened and half of the parents have reported that their child argues with the rest of the family. Almost 43% of the parents have reported increasing restlessness and every third parent has reported increasing frustration. The magnitude of the

Table 2: *Parents Perception of the Emotional and Behavioral Effects of the Quarantine in their Children with Preexisting Psychiatric Difficulties*

S. No	Questions	Less as compared to before lockdown		No Change before and after lockdown		More as compared to before Lockdown	
		N	%	N	%	N	%
1	My Child is worried	05	2.2	180	80.0	39	17.3
2	My Child is restless	15	6.7	113	50.2	96	42.7
3	My Child is anxious	13	5.8	153	68.0	57	25.3
4	My Child is sad	24	14.8	148	65.8	52	23.1
5	My Child has nightmares	19	8.4	175	77.8	30	13.3
6	My Child is reluctant	13	5.8	171	76.0	35	15.6
7	My Child feels lonely	16	7.1	177	78.7	27	12.0
8	My Child wakes up frequently.	21	9.3	175	77.8	29	12.9
9	My Child sleeps little.	09	4.0	182	80.9	31	13.8
10	My Child is very indecisive	09	4.0	161	71.6	53	23.6
11	My Child is uneasy	21	9.3	119	52.9	83	36.9
12	My Child is nervous	21	9.3	147	65.3	56	24.9
13	My Child is afraid to sleep alone.	08	3.6	125	55.6	90	40.0
14	My Child argues with the rest of family	21	9.3	91	40.4	112	49.8
15	My Child is very quiet	11	4.9	181	80.4	32	14.2
16	My Child cries easily	16	7.1	114	50.7	94	41.8
17	My Child is angry	27	12.0	46	20.4	152	67.6
18	My Child asks about death	04	1.8	201	89.3	18	8.0
19	My Child feels frustrated	18	8.0	134	59.6	72	32.0
20	My Child is bored	22	9.8	156	69.3	46	20.4
21	My Child is irritable	22	9.8	112	49.8	88	39.1
22	My Child has sleeping difficulties	08	3.6	167	74.2	46	20.4
23	My Child has no appetite	15	6.7	168	74.7	41	18.2
24	My Child is easily alarmed.	04	1.8	203	90.2	17	7.6
25	My Child has difficulty concentrating.	05	2.2	132	58.7	84	37.3
26	My Child is afraid of COVID-19 infection	05	2.2	210	93.3	08	3.6
27	My Child is very dependent on us	10	4.4	127	56.4	87	38.7
28	My Child has physical complaints like headache, stomachache	38	16.9	146	64.9	40	17.8
29	My Child has behavioral problems	13	5.8	115	51.1	97	43.1
30	My Child eats a lot	04	1.8	195	86.7	25	11.1
31	My Child worries when one of the parents leave the house	09	4.0	143	63.6	72	32.0
32	My child has shown deterioration/ regression in behavior and functioning (Bedwetting/ decrease vocabulary/ daily skills).	10	4.4	192	85.3	22	9.8

psychological impact can be felt with 39% of the parents reporting irritability and increased dependence of the children. These results are in line with studies from China, Italy and Spain reporting high levels of irritability, restlessness, clinginess and inattention among children in quarantine during COVID-19.[1,5,9] Literature suggests that defiant behaviour is one of the common reactions noticed by parents, when children are worried.[2] Worsening of behavioral problems can be explained with the fact that significant proportion of our sample has varying degrees of intellectual disability and other neurode-velopmental disorders. These children have impairment in communication skills and their worsening behavioral problems may be a manifestation of their inability to express and communicate in a stressful environment. A study done on children with an autism spectrum disorder in COVID-19 showed a magnified psychological impact as well as difficulties for parents to deal with them.[12] Similar studies were done in children with ADHD, eating disorders and OCD which revealed high levels of anxiety, irritability, anger, fear, nervousness, mood changes, sleep disturbances, appetite changes and signs of regression.[13-16]

Children with emotional difficulties may feel overwhelmed with fear, deaths and morbidity associated with COVID-19. Similarly, disease containment measures can worsen Obsessive-Compulsive symptomatology in children and adoelscents.[2] Prolonged stressful environment with the interruptions in medical treatment and psychotherapies multiplies the magnitude of the problems these children and their parents are facing. Although Telehealth services have been functional, some parents may find it inconvenient to discuss their problems on a telephonic interview. Lack of face-to-face services and peer support groups can lead to higher levels of psychological problems in the current scenario.[4]

Studies suggest that children as young as 2 years can sense changes in their surroundings and are subject to mood and behavioural changes in response to it.[17] Hence, anxiety in parents and family members due to COVID-19 can lead to anxiety in children as well.[18] In this study, we have found that 36% of the parents were experiencing significant stress in the current pandemic. Increase distress in parents can affect their ability to be supportive caregivers, in turn leading to worsening of psychological problems in children.[19] Excessive exposure to information regarding COVID-19 can also lead to high levels of anxiety in children.[17] In our study, every fourth parent reported worsening anxiety and nervousness in their children, while 37% of the children were having difficulty in concentration and a feeling of uneasiness. The children were also facing anxiety about their parents as evident by every third child becoming worried when parents leave the house. In our study, 40% of the children were afraid to sleep alone while 13% were having nightmares. Every fourth child was feeling increasing sadness and 40 % of the children were crying excessively indicating that children with pre-existing psychiatric and developmental problems have been significantly affected by the COVID-19 Pandemic. Literature from previous disasters and pandemics also suggests an increased incidence of anxiety and PTSD in children and their parents and regression of previously attained milestones.[20,21]

With the closure of schools, there has been an increasing difficulty for children to maintain their everyday routines.[3,4] As highlighted by Wang et al, we also found that with school closure and lockdown, parents noted increased screen time, decreased physical activity, irregular sleep patterns and diet changes in their children.[3] Although one-third of the children have continued their education at home through home tuition and regular teaching activities by the family members. but schools play an important role in building routine as well as social skills for most patients of ASD or other psychiatric problems.[4,10] School routines also help in coping in children with existing psychiatric issues.[22] Companionship is also severely affected by the quarantine in COVID-19 as they depend on their daily classmates' and friends' interactions to improve their social functionality.[8] An increase in screen time and lack of physical activity also contribute to the symptoms of anxiety and depression in children with a pre-existing psychological disease.[8,10,23] Thus, unhealthy lifestyle alongside increase risk of abuse and neglect during quarantine can contribute to further worsening of mental health problems in these vulnerable children.[24]

Our study results need to be seen in the context of various limitations. Study sample is small and limited to children receiving psychiatric treatment from one tertiary care hospital setting. Majority of respondents belonged to urban area. Children living in rural areas may exhibit more behavioural and emotional changes due to limited services available during COVID-19 Pandemic, however, given the fact that the burden of Coronavirus was seen more in urban areas, more space and outdoor activities in rural areas means thus it may not necessarily be the case. We did not assess parental response to Pandemic, which can understandably affect children's reactions in stressful situations. To conclude, children with preexisting psychiatric issues are vulnerable to worsening of their illness and behaviours during COVID-19. Parents, healthcare providers and policymakers need to be aware of these risks and need for mental health support during lockdown. Further large scale research on impact of COVID-19 Pandemic on emotions and behaviours of children with mental health issues is necessary, so that supportive interventions can be offered.

Authors Contribution
ZHB, NI: Conceived the idea of this study, c
ZHB, NB, SL: Collected Data
NI, ZHB, NB, SL: helped with writing-reviewing & Editing.
NI: was responsible for the supervision of this project
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Knowledge, Attitude and Practice Among Healthcare Professionals Regarding COVID-19: A Cross-Sectional Survey from Department of Obstetrics & Gynaecology, Services Hospital Lahore

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Abstract

Background: Pakistan is among 180+ countries dealing with Corona virus pandemic.Pakistan faces sudden hike in number of positive cases including number of healthcare professionals (HCPs) also acquired infection. Therefore, the aim of study is to assess knowledge, attitude and practices among HCPs regarding COVID-19 and identifying gaps which will help in formulating future recommendations.

Objectives: To determine knowledge, attitude and practice among health care professionals regarding COVID 19 in department of obstetrics and gynaecology, Services hospital.

Methods: A cross-sectional survey carried out in department of obstetrics and gynaecology, Services hospital, Lahore from 15th June to 15thJuly. A structured questionnaire was distributed to 260 healthcare workers after informed consent.

Results: Two hundred sixty participants in total were included in the study.51% were junior doctors 10% were consultants, 17.3% were paramedics and 20.38% were nurses. Nurses and junior doctors showed moderate knowledge, 62% and 65 percent respectively, practice and attitude 67% and 71% respectively while good knowledge and attitude among senior doctors 77.7% and 85%. Need to focus on paramedics who exhibit below average knowledge, practice and attitude 51 and 55.5%.

Conclusion: The HCWs in showed a moderate level of knowledge and positive attitude toward Coronavirus disease. There was a clear difference in knowledge level between different levels of HCWs. Serial educational interventions inform of workshops and seminars and professional campaigns are strongly recommended.

Keywords: Coronavirus disease 2019, Knowledge, Attitude, Practice Healthcare workers

Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. It is a respiratory virus which is transmitted chiefly through droplets generated when an infected person coughs or sneezes, or through droplets of saliva or discharge from the nose.[1]

On 31st December 2019, China alerted the WHO regarding several cases of pneumonia of unknown cause in Wuhan, capital city of Province Hubei.[2] The pathogen identified was named as novel coronavirus (2019-nCoV), currently called as severe acute respiratory syndrome corona virus-2 (SARS-CoV-2), an enveloped and single stranded RNA virus which has phylogenetic resemblance to SARS-COV-1.[3]

The COVID-19 pandemic is the world biggest public health challenge. The World Health Organization (WHO) on March 11 declared COVID-19 a pandemic,[4] which at time of writing has affected more than eighteenmillion people and caused more than seven hundred thousand deaths.[5] WHO director general stated that "this is not just a public health crisis, it is a crisis that will touch every sector.So every sector and every individual must be involved in the fights".[4]

Till now virus has affected two hundred and fifty thousand people in Pakistan with more than five thousand deaths.[6] According to health ministry "among healthcare workers doctors are the most affected peoples as 61 per cent or 3,275 of them have

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so far suffered from COVID 19 infection, followed by 1,453 paramedics, making 27 per cent of the total healthcare providers infected with the deadly virus. About 639 nurses are also among them, which is 12 per cent of the total cases.[7]

58 healthcare workers have so far lost their lives due to COVID 19 infection and still count is increasing. Among these are 42 doctors, 13 paramedics and other support staff, two nurses and one medical student. At present, 240 healthcare providers are hospitalized, of whom 231 are in a stable condition, while nine are on life support," an official of the National Health Services, Regulations and Coordination (NHSR&C) told.[7]

The fact that health care workers are at risk for Corona infection is a serious issue because HCWs help control the outbreak of disease and provide treatment and care to the patients. Therefore, all possible steps should be taken to control the spread of the virus in healthcare workers, first by identifying the risks of infection and then taking the appropriate steps to reduce these risks. It is well established that the transmission of the disease among HCWs is associated with overcrowding, the absence of single living rooms, and environmental contamination.[8] However, this may be linked to the fact that some HCWs have insufficient understanding of infection prevention strategies. Knowledge of the disease can influence the status and actions of HCWs, and inaccurate and inappropriate behaviors directly increase the risk of infection.[9]

Amid the current pandemic, the WHO has issued a number of guidelines and also launched many online courses and training sessions to raise awareness for prevention and control of COVID-19 in HCPs.[10] National Institutes of Health (NIH), Islamabad, Pakistan has also published several recommendations for HCPs with the aim of reducing occupational spread.[11] Although educational campaigns have increased their awareness, it is unclear to what extent this knowledge of COVID-19 is yet to be put into practice and how much this practice actually reduces the spread of COVID-19 infection. Knowledge, attitude, and practice survey provides an appropriate format to assess existing programs and to identify effective strategies for behavior change in society.[12]

Understanding HCWs' knowledge, behaviors, and practices helps in preventing spread among them. Therefore, this study aims to determine knowledge, attitude and practice among health care professionals regarding COVID 19 in the department of Obstetrics and Gynaecology of Services hospital.

If the knowledge regarding the disease and the factors that influence their attitudes and behavior can be determined promptly in the early stages of the outbreak, this information can inform relevant training and procedures during the epidemic and guide HCWs in prioritizing protection and avoiding professional exposure.[13]

Methods

This study was conducted in Services hospital, Lahore. Lahore is critically affected by COVID-19. Services hospital is one of main center receiving Corona patients. This cross-sectional survey was conducted at the obstetrics and gynecology department of Services Hospital Lahore over a span of 1 month from 15th June to 15th July 2020. The study participants were healthcare workers, that is, consultant, medical officer, postgraduate trainee, house officer, and paramedical staff. A convenient sampling method was used. The study was conducted using a semi-structured questionnaire. The questionnaire was developed with the help of previous literature and research papers on KAPs of HCWs. It consisted of two parts: (1) basic demographic characteristics (age, gender, occupation), and (2) knowledge, attitude, and practices regarding COVID 19. At the beginning of the study, the nature and purpose of the study were explained to each participant, and informed consent was obtained. After confirmation for participation, they were directed to complete the questionnaire.

The questionnaire consisted of questions regarding demographics, sources of information, 20 question consisted of knowledge and 12 questions of attitude and practice towards COVID 19.

The knowledge section has 20 items and each question was answered yes or no. Correct answer scored 1 and incorrect answer score 0. The attitude and practice section consists of 12 items and responses were recorded on a five-point Likert scale (1, rarely; 2, sometimes; 3, occasionally; 4, most of time; 5, almost). Responses are presented as percen-

tages and frequencies. Responses divided in three group as good >80%, moderate 60-80%, and poor <60%.

Ethical approval has been taken from IRB of services hospital/SIMS.

Results

Results and discussion

This study was conducted during peak of the Corona outbreak in a critically affected area Lahore, where according to govt. official most of positives cases of Punjab are present. In Punjab approximately eighty five thousand people are affected by COVID19 and majority of these are from Lahore at the time of survey. Daily 4 to 5 hundred cases are being reported from Punjab.[6] Health care workers are frontline warriors and across Pakistan estimated 32% health

Demographics

Demographic Characteristics	N=260	%
Gender		
Male	27	10.3%
Female	233	89.6%
Age		
21-30	141	54.3%
31-40	65	25%
41-50	37	14.2%
51-60	17	6.5%
Occupation		
Nurses	53	20.38%
Paramedic	45	17.3%
Resident doctor	135	51.9%
Consultant	27	10.3%

Sources of Knowledge n=260

Sources	N=260	%
Social media	170	65.38%
Television/radio	126	48.46%
Friend & family	57	17.3%
Workshop & seminar	20	9.6%
Newspaper	25	1.7%

Knowledge Regarding Corona Virus n=260

Response	Good (>80%)	Moderate (60-80%)	Poor (<60%)
Paramedics n=45	13(28.8%)	23 (51.1%)	9 (20%)
Nurses n=53	12(22.6%)	33 (62.2%)	8(15.09%)
Junior doctors n=135	34 (25.18%)	89 (65.9%)	12 (8.8%)
Senior Doctors n=27	21 (77.7%)	6 (22.2%)	---------

Practice & Attitude regarding corona Virus n=260

Response	Good (>80%)	Moderate (60-80%)	Poor (<60%)
Paramedics n=45	8 (17.7%)	25 (55.5%)	12 (26.6%)
Nurses n=53	8 (15.09)	36 (67.9)	9 (16.9%)
Junior doctors n=135	24(17.7%)	96(71.1%)	15 (11.1%)
Senior Doctors n=27	23 (85.1%)	4 (14.8%)	-----------

care workers have acquired the infection based on antibody testing and country has lost many valuable lives of health care workers. The analysis of health-care workers knowledge, their attitudes and practices regarding COVID 19 transmission, infection prevention knowledge and practices, education of others and counseling could provide a reference for preventing further spread of the epidemic among health care workers and developing recommendations in our context.

260 participants in total were included in the study. 51% were junior doctors 10% were consultants, 17.3 % were paramedics and 20.38% were nurses (table 1). To treat COVID patients with lowest possible risk, for all HCWs, it is essential to have good knowledge, a positive attitude and goodpractice regarding precautionary measures such as donning and doffing of personal protective equipment's and infection prevention protocols adherence. The continuing pandemic made it necessary for HCWs all over the world, to adopt increased precautions and make every measure to follow appropriate hygienic conditions and WHO recommendations regarding prevention of disease spread.[14]

The results of our study revealed that HCWs had a moderate level of knowledge and satisfactory attitude and practices towards the COVID-19 outbreak especially among higher hierarchy.

In survey most of participants were aware of fact that COVID19 is a global concern. Main source of information was social media followed by television and radio. Only 9 percent of participants took information from workshops and seminars and 1.7% read newspaper to remain updated. The findings are similar to other researches, in which social media is major source of information on COVID-19.[14] It is necessary for health care workers to consult reliable sources to seek information on COVID 19 like guidelines and material of WHO and CDC. There is a possibility that a lot of misinformation and myths

regarding corona virus will be spreading through social media. Knowledge and practice of doctors can be affected by the sole use of this media.

Among survey partakers senior doctor's exhibit good knowledge scores while junior doctors and paramedics have moderate knowledge. Sufficient knowledge and understanding is required in dealing with disease confidently. As knowledge directly affects attitude it is a basic requirement for forming prevention beliefs, promoting positive attitudes and practices. The effectiveness of one's coping mechanism and behaviour to some extent depends upon individual perception and approach towards disease.[15]

The results of study are comparable with survey conducted by Mohd. Saqlain et al which shows that majority of HCWs have good knowledge (93.2%), a positive attitude and practice (88.7%) towards COVID-19.[15] Giao et al. also reported that 88.4% participants, had sufficient knowledge regarding COVID-19.[16] Another study conducted by Nemati et al in Iran showed that only 56.5% of respondents had sufficient knowledge regarding transmission, symptoms and treatment of COVID-19.[17]

Good knowledge of health care workers is essential in this era of global pandemic no vaccine exists with ongoing research, so they must be aware of all the latest guidelines and take precautions in preventing the disease spread.

It is important fact that insufficient knowledge is not sole risk factor for spread of disease but attitude and practice are equally important. In our study Health care workers exhibit positive attitude and practices towards pandemic, but most of them are afraid of getting the virus and passing it to their family members. Most of them followed proper hand washing techniques, donning and doffing of PPE and use of face mask. They were ready to maintain quarantine with family to prevent spread.

Most of participants had positive attitude towards active participation in infection control programs but many of them have not received training about infection prevention and control. Also there is lack of workshops, seminars and refresher courses to keep HCWs updated on guidelines of infection control and use of PPE. As seen in results of the survey that knowledge and positive practices are towards lower

side among paramedics, hence this group needs special attention and policy makers must target these health care worker group. Probably they are not involved and given access to ongoing webinars, online CMEs and training sessions which reflects in poor knowledge and practices among them towards Covid 19. They also have more contact with other administrative staff and non-clinical staff as compared to doctors and senior consultants ant this further emphasizes the need of arranging workshops and online sessions for them. There is an urgent need for regular educational interventions and trainings on infection control protocols. It is the need of the hour to start educational programs to address and target those persons who exhibit insufficient knowledge level and practices.

Conclusion

The burden of long working hours, psychological and physical stress, burnout, loss of family members, fear of disease, deaths of colleagues are additional huge hazards along with highly contagious nature of disease and all these factors can lead to immense damage to healthcare system of our country. In addition to this stressful era awareness, attitudes and practices are not up to mark which can lead to a disaster in health care facilities and adversely affect patient care.

Healthcare workers are on frontline and are essentially vulnerable to COVID 19 infections. Though Pakistan is a middle income country with low resources and high burden of disease at the time of writing the article even then by enhancing the knowledge and awareness among health care workers and addressing their practices and attitudes at every level of their service can be of great help in keeping the spread of the disease low and protecting the HCW themselves. Occupational health has always been a neglected or less attended area in Pakistan whereas it is most important field to decrease the risk of transmission to HCWs and continuation of optimal care and services to our patients.

Disclaimer: This article was last update on 26 July 2020 and as COVID 19 pandemic is rapidly evolving situation so it is recommended to review latest information from local and international health organizations.

Authors Contribution

MR: Concept data collection, analysis write up and approve.

KKM: Analysis write up and approve.

RS: Whole Project Supervise

QS: Data collection

FS: Data analysis and date collection.

Conflict of Interest: None

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Assessment of Depression in Health Care Workers Dealing with Coronavirus Disease 2019 (COVID-19) Patients During the Pandemic

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Abstract

Objective: To find frequency and severity of depression among health care workers (HCWs) dealing with coronavirus disease 2019 (COVID-19) patients during the pandemic

Methods: This cross sectional survey was done at all medical units, Services institute of medical sciences. Data was collected in 4 weeks of time [1st July, 2020 till 28th July, 2020] using random sampling. A total of 120 health care workers working in medical units of any designation aged 20-60 of either gender were taken. Their basic demographic information was asked and depression was assessed using Hamilton Depression (HAM-D) Rating Scale. All data was collected under supervision of principal author. All collected data was entered and analyzed using SPSS version 24.

Results: The mean age of participants was 26.11 ± 3.14 years with minimum and maximum age as 20 and 36 years. There were 56(46.7%) male and 64(53.3%) female participants. According to their designation, 1(0.8%) was paramedic, 2(1.7%) were nurses, 115(95.8%) medical/house officers and 2(1.7%) were assistant professor. The frequency of depression in these HCWs was found in 45(37.5%) while mild depression was seen in 35(29.2%) and moderate depression was seen in 10(8.3%) of the HCWs. There were was no difference of frequency of depression among male (48.9%) and female (51.1%), p-value = 0.705

Conclusion: It is concluded that the depression was found in more than one third of HCWs during the covid epidemic so effective and significant strategies must be introduced in improving their psychological and mental health. By controlling depression they can put their concentrations for quality health care provision.

Keywords: COVID-19, pandemic, health care workers, depression, Hamilton Depression Rating Scale

Introduction

A disease previously known as severe acute respiratory syndrome coronavirus-2 was first seen in last week of December, 2019 in Wuhan City of China[1] and patients presented with pneumonia for unknown etiology that was later named as coronavirus disease 2019 (COVID-19) by world health organization (WHO).[2,3] In few days it was declared as health emergency by WHO later[2,3] as it spread very quickly in China and later in few days it spread worldwide including America, Australia Europe,

Asia including developing countries like Pakistan.[4] In the start the clinicians focused on clinical features identification then put their efforts to treat the patients.[5] The diagnosis is mainly based on real time reverse transcription-polymerase chain reaction (RT-PCR) assay but sometimes it has false negative rate.6 Computed tomography and Chest X-rays has also very important role in diagnosis of COVID-19.[7-11]

The pandemic of COVID-19 had huge burden on psychological stress on humans around the globe[12] and eventually has greatly affect the social, mental and physical health of all, especially health care provider, the frontline fighter with the crisis.[13-15] The psychological burden further leads to different advanced psychological issues, like fear, anxiety, depression and lack of sleep.[16-19]

After emergence of COVID-19 in Pakistan, it was also reported that the health care providers faced emotional and physical burden. Moreover the basic reason of this psychological trauma was lack of

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equipment for safety to get infection, fear of isolation from family or lack of contact with family, and exhaustion after heavy emergency duties.[20] Hence there is a need to assess their psychological and mental health issues.[13] If anxiety and depression is found high then special educational sessions will be arranged for them in order to reduce to risk of further sequel.

Methods

It was a Cross sectional survey. Data was collected in 4 weeks of time [1st July, 2020 till 28th July, 2020] The study was conducted at Medical units, Services institute of medical sciences. A total of 120 health care workers were taken. Random sampling was used. Health care workers working in medical units of any designation between ages 20-60 years of either gender were included. Health care workers having death in family in past 6 months or having history of pre-existing psychiatric illness were excluded.

The study was started after taking informed consent form participant and they were given the structured proforma to be filled. A total of 120 participants were approached and after 24-48 hours they were requested to give it back at unit-4 of medicine, SIMS. Their basic demographic information was asked and depression was assessed using validated proforma i.e. Hamilton Depression (HAM-D) Rating Scale (in current study we found Cronbach's Alpha = 87.9% sowing high reliability of data), HCWs with HAM-D score = 0–7 labelled as normal, mild depression was labelled on score 8–16, HCWs with 17–23 scores were labeled as moderate depression and score > 24 were labelled as severe depression.[21] All data was collected under supervision of principal author. All collected data was entered and analyzed using SPSS version 24. Mean ± S.D were calculated for quantitative data like age, HAM-D score. Frequency and percentages were used for categorical data like gender, depression and severity of depression. Chi-square test was applied to compare depression among gender and results of COVID-19, taking p-value ≤ 0.05 as significant.

Results

The mean age of participants was 26.11 ± 3.14 years with minimum and maximum age as 20 and 36 years. There were 56(46.7%) male and 64(53.3%) female

participants. According to their designation, 1(0.8%) was paramedic, 2(1.7%) were nurses, 115(95.8%) medical/house officers and 2(1.7%) were assistant professor. According to 63(52.5%) health care workers (HCWs) they were sad/down, 43(35.8%) were confused or reduced their ability to concentrate, 45(37.5%) felt extreme guilt about family, 67(55.8%) reported tiredness, 52(43.3%) HCWs had troubled sleep, low energy was reported by 55(45.8%), 33(27.5%) HCWs had thought of impending disaster and in 33(27.5%) HCWs there were weight and appetite change. There were 69(57.5%) HCWs who were tested for COVID-19, among them 25(36.23%) were positive. The mean Hamilton depression score was 6.58 ± 5.95 with minimum and maximum Hamilton depression score as 0-24. The frequency of depression in these HCWs was found in 45(37.5%) while mild depression was seen in 35(29.2%) and moderate depression was seen in 10(8.3%) of the HCWs. There were was no difference of frequency of depression among male (48.9%) and female (51.1%), p-value = 0.705. Moreover there was no difference of frequency of depression among those who were tested positive for COVID-19 (26.7%), tested negative for COVID-19 (31.1%) and who were not tested (42.2%), p-value = 0.45.
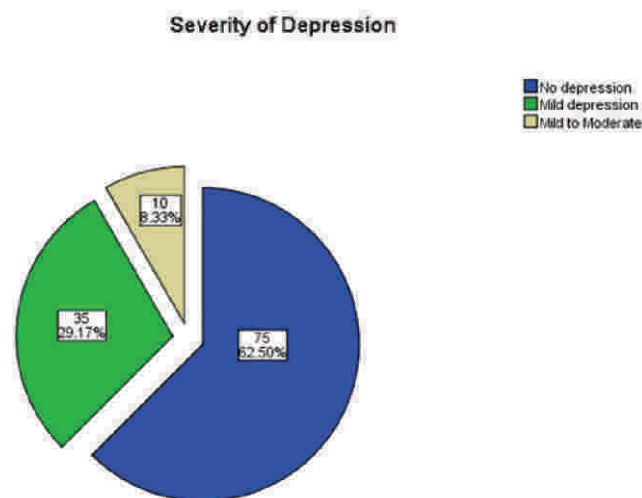
Fig-1: *Severity of Depression Among HCWs*

Discussion

The coronavirus disease 2019 (COVID-19) pandemic has caused great financial and psychological havoc. Healthcare professionals (HCPs) are among the many groups of people who are in the frontline and facing a risk of direct exposure to the virus.[22,23]

Table 1: *Distribution of different Variables Asked during Survey*

		Frequency	Percentage
Gender	Male	56	46.7
	Female	64	53.3
Designation	Paramedical	1	.8
	Nursing staff	2	1.7
	Medical officer	115	95.8
	Asst. Prof	2	1.7
Sad/down	Agree	63	52.5
	Indifferent	25	20.8
	Disagree	32	26.7
Confused or reduced ability to concentrate	Agree	43	35.8
	Indifferent	30	25.0
	Disagree	47	39.2
Excessive fears / worries	Agree	45	37.5
	Indifferent	24	20.0
	Disagree	51	42.5
Extreme feeling of guilt about exposing family	Agree	54	45.0
	Indifferent	28	23.3
	Disagree	38	31.7
Tiredness	Agree	67	55.8
	Indifferent	20	16.7
	Disagree	33	27.5
Troubled sleep	Agree	52	43.3
	Indifferent	25	20.8
	Disagree	43	35.8
Low energy	Agree	52	43.3
	Indifferent	25	20.8
	Disagree	43	35.8
Thoughts of impending disaster	Agree	33	27.5
	Indifferent	25	20.8
	Disagree	62	51.7
Weight change / appetite change	Agree	33	27.5
	Indifferent	30	25.0
	Disagree	57	47.5
Tested for COVID-19	Yes	69	57.5
	No	51	42.5
COVID-19 result	Positive	25	20.8
	Negative	45	37.5
	Test not done	50	41.7

Table 2: *Comparison of Depression with Respect to Gender and Covid-19 Testing*

		Depression		Chi-square (p-value)
		Yes	**No**	
Gender	**Male**	22(48.9%)	34(45.3%)	0.143
	Female	23(51.1%)	41(54.7%)	(0.705)
COVID-testing	**Positive**	12(26.7%)	13(17.3%)	1.96
	Negative	14(31.1%)	31(41.3%)	(0.374)
	Not done	19(42.2%)	31(41.3%)	

In current study the frequency of depression in these HCWs was found in 45(37.5%) while mild depression was seen in 35(29.2%) and moderate depression was seen in 10(8.3%) of the HCWs. Another study was done on 2299 participants (257 administrative staff and 2042 medical staff) to find status of depression using HAM-D scale and reported depression among medical staff as 12.81%.[12] They further concluded that medical staff working with infected patients, had higher 1.4 times higher chances of having fear and 2 times more likely to have depression and anxiety.[12] In same context a longitudinal study was done on general population 2 times (during the initial outbreak and then four weeks later after the COVID peak). They found that there was a significant reduction in mean scores measured for depression (from 32.98 to 30.76, $p < 0.01$) after 4 weeks.[19]

Like our statistics one more study reported depression among doctors was high i.e. 45.6% doctors and anxiety was found in 11.4%[24] they further added it was higher in female HCWs.[24] While in current study both male and female HCWs had same rate of depression. Another study was done on 1210 people and found that moderate to severe psychological impact of the pandemic was measured among 53.8% of respondents.[25] Moreover an Indian study reported that health professionals need special attention because of their higher psychological distress.[15] So mental health of HCWs must be strengthened through specialized team to provide psychologic support during the peak of the pandemic[26] in order to boost their moral and to avoid depression for better control of such infectious diseases and pandemics.[27]

Conclusion

It is concluded that the depression was found in more than a quarter of HCWs so effective and significant strategies must be introduced in improving their psychological and mental health. By controlling depression they can put their concentrations for quality health care provision.

Authors Contributions

AB: Project Supervise.
SW: Data Collection, Analysis.
MA: Data Collection.
ZDB: Data Reviewer.
JA: Compile Data.
AH: Corrections, analysis & approve.

Conflict of Interest: None

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Dietary Habits and Choices before and during COVID-19 Pandemic Among Medical Students of Pakistan

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Abstract

Objective: COVID-19 pandemic which was emerged in China and in December 2019 but later it was become a pandemic and Pakistan also get affected from it due to which all educational institution gets closed on 14th March. This study was aimed to explore the changes in dietary habits and choices among medical students of Pakistan.

Methods: An online survey was conducted in June 2020 involving 385 medical and dental students of the age (16-31years) from different medical colleges. After providing informed consent participants complete this online survey.

Results: Majority students were having normal BMI (18.5-24.9) having no dietary problem and not currently losing weight. Majority of students used to skip meals before COVID-19 but during COVID-19 this ratio lessened out, the ratio to eat in between meals had increased as 260(79%) females and 43(76.8%) males during the period of COVID-19 but the habit to eat at night was same before and during COVID-19. About the preference of food, we found that student's preference towards fresh fruits, pasta and rice, bread /cereals, pulses, snacks, fruit juices, soft/fizzy drinks, tea/coffee, milk remained the same. Preference of cakes and ice-cream, pizza, packed/readymade food decreased during COVID-19.

Conclusion: Healthy preferences and habits during COVID-19 among medical students were founded in this study.

Keywords: COVID-19, Dietary habits, Dietary preferences

Introduction

COVID-19 was first reported in Wuhan city of China in December 2019 in March 2020 WHO declared it as Pandemic.[1] In Pakistan first case of COVID-19 was reported on 26th March in Karachi. But later on all educational institution get closed on 14th March 2020. As a result of mandatory lockdown produced problems like low mod irritability, psycho-logical distress, anger, exhaustion and insomnia. These stressful events effect the eating patterns.[1] Stress alter overall eating habits resulting under and over eating which is influenced by the severity of stress. Acute stress which leads to the activation of the sympathetic adrenal medullary system (release of catecholamines) which may decrease food intake.[2] Anxiety, uneasiness, anger, apathy is commonly accompanying chronic stress due to hyperactivation of hypothalamic pituitary adrenal axis which lead to increase in the release of the cortisol which is referred as a stress hormone which cause some individual to binge eating.[2-3]

Some diets are having positive effect on mood possibly by providing polyphenols, vitamins and trypto-phan for serotonin production. Psychological factors have great influence on the dietary preference.[4] It is recommended by the WHO "If you must stay at home, maintain a healthy lifestyle - including proper diet, sleep, exercise and social contacts with loved ones at home and by email and phone with other family and

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friends."[5] Healthy preferences of the food such as plenty fresh fruits and vegetables (because they have excess of anti-oxidant and anti-inflammatory substances),[1] avoiding caffeine (because it increase feeling of anxiety and agita-tion),[6] are very much necessary as to maintain good health and immunity at the time of COVID-19 Pandemic.

Nationwide lockdown in Pakistan due to COVID-19 may potentially alter dietary habits of students by forcing them to stay at home for a prolonged period of time, often with unlimited access to food and lower physical activity. This is of particular concern in the case of individuals with pre-existing nutritional issues.

Medical education is itself very stressful and due to lockdown, medical institutes did not get proper time to maintain the system of online classes and students were also not prepared to take online classes this result creating stress in students.

Keeping in view all the factors, this study was designed to determine the dietary habits and food choices among medical students before and during COVID-19 Pandemic

Methods

This cross-sectional study was conducted in June 2020 by anonymous online survey by convenience sampling. Ethical approval for this study was taken by the Ethical Review Board of CMH Lahore Medical College and institute of Dentistry. The data was collected by questionnaire having two parts: demographic information (having age, gender, and BMI) and pretested questionnaire for eating habits and preference of food.[7] Total 385 respondents took part in the study after the informed consent. Data analysis was performed by using the Microsoft Excel 2016 and IBM Statistic version 20. Microsoft excel was used to editing and coding and then the excel file was imported to SPSS software. Descrip-tive statistics (frequency, percentage) and Chi square test was executed by using the SPSS software. P-value less than or equal to 0.05 was taken as significant.

Results

Table (1) showed that the student population were female (85.5%) and male (14.5%) of age between (16-31 years). The higher percentage of age group (73.5%) were of 21 years and younger. Regarding the

BMI higher percentage of students (65.7%) were in normal range of BMI between 18.5-24.9.

There were 181(55%) students who used to skip their meals before COVID-19 (p value 0.004) and about 167(50.8%) of students skipped meals during COVID-19 (p value .000).240(72.9%) of students used to eat in between their meals before COVID-19 (p-value 0.609). 260(79%) of students agreed that they eat in between their meals during COVID-19 (p-value 0.705). 219(66.6%) students agreed with statement that they eat at night before COVID-19 (p-value .009). 215(65.3%) students agreed that they eat at night during COVID-19 (p-value 0.374). 231(70.2%)females 47(83.9%) males had no dietary problem (p-value 0.065) .

Table-2 and Table-3 showed students preferences of food before and during COVID-19 respectively. It showed that more students 202(61.4%) had fresh fruits everyday during COVID-19 and 147(44.7%) had fresh fruits everyday before this pandemic. Prefrence of eating raw vegetables also increased among medical students during COVID-19 because 117(35.6%) females and 42.9% male had raw

Table 1: *Demographic Charateristics of Participants*

Character	Frequency	Percent
Age		
21 years and younger	283	73.5
22-25 years	100	26.0
26 years	1	0.3
31 years	1	0.3
Gender		
Male	56	14.5
Female	329	85.5
BMI		
Underweight(below18.5)	70	18.2
Normal (18.5-24.9)	253	65.7
Overweight (25-29.9)	57	14.8
Obese (30 above)	5	1.3

vegetables everyday.

Discussion

This study showed that majority of students used to skip meals before COVID-19 but during COVID-19 this ratio lessened out, the ratio to eat in between meals had increased as 260(79%) females and 43(76.8%) males during the period of COVID-19 but the habit to eat at night was prevalent both before and during COVID-19. Excessive eating (in between meals or at night) might be a way to cope stress.[8] Majority of students had no dietary problem and not curruently loosing weight and have normal BMI (18.5-24.9).Regarding diet preferences; before

COVID-19 majority had cakes and ice-cream 2-3 times a week however during COVID-19 majority students never had cakes and ice-cream. Majority had pizza 1-2 times a month before COVID-19 however during COVID-19 they never had pizza. Before COVID-19 majority had Packed/ready food everyday however during COVID-19 majority never had packed/ready food. Preference of students towards fresh fruits, pasta and rice, bread /cereals, pulses, snacks, fruit juices, soft/fizzy drinks, tea/coffee, milk remained the same. Adequate fruits and vegetables are healthy prefe-rences as they have several vitamins like vitamin A, B-complex, C and D and micronutrients help to boost immunity.[9] Vitamin C reduce oxidative stress in body and modulate immune response.[9] Preference of cakes and ice-cream , pizza, packed/ready made food decreased during COVID-19. That is the medical students changed the habits during COVID-19. Increase in food intake was founded but it was actually the response of body to chronic stress.[2,3] Evidences shows that in vivo social isolation is related to the increased food consumption.[10] However, there is no diet that is proven as having nutrients that prevent or treat the COVID-19 but balanced diet having proper nutrient intake is necessary because it is essential to maintain immu-nity against COVID-19.[9]

Conclusion
Change in the dietary habits and choices of medical students was found during COVID-19. Overall it revealed that good dietary changes were found among the medical students of Pakistan in current Pandemic situation.

Authors Contribution
AN, RM, AA: Literature search, study design and concept, questionaire design, data collection.
FI: Drafting, revision and final approval.
RKA: Data analysis, data interpretation and drafting
HR: Drafting revision and final approval.

Conflict of Interest: None

Table 2: *Dietary Habits before COVID-19*

QUESTIONS	GENDER	NEVER		EVERYDAY		TWICE A DAY		2-3 TIMES A WEEK		1-2 TIMES A MONTH		p-Value
BEFORE COVID-19		count	%age	count	%age	count	%age	count	%age	count	%age	
Fresh fruits	Male	4	7.1	29	51.8	3	5.4	20	35.7	0	.0	0.156
	Female	45	13.7	147	44.7	10	3.0	106	32.2	21	6.4	
Raw vegetables	Male	11	19.6	18	32.1	5	8.9	21	37.5	1	1.8	.020
	Female	106	32.2	79	24.0	10	3.0	104	31.6	30	9.1	
Cakes and ice-cream	Male	19	33.9	4	7.1	1	1.8	18	32.1	14	25.o	0.172
	Female	72	21.9	59	17.9	5	1.5	110	33.4	83	25.2	
Pasta and Rice	Male	10	17.9	12	21.4	5	8.9	24	42.9	5	8.9	0.136
	Female	28	8.5	101	30.7	17	5.2	148	45.o	35	10.6	
Bread/cereals	Male	7	12.5	31	55.4	4	7.1	11	19.6	3	5.4	0.753
	Female	36	10.9	179	54.5	18	5.5	86	26.1	10	3.0	
Pulses	Male	9	16.1	14	25.o	2	3.6	27	48.2	4	7.1	0.919
	Female	42	12.8	81	24.6	20	6.1	162	49.2	24	7.3	
Pizza	Male	18	32.1	6	10.7	4	7.1	11	19.6	17	30.4	0.714
	Female	90	27.4	43	13.1	13	4.o	79	24.o	104	31.6	
Snacks	Male	16	28.6	15	26.8	5	8.9	16	28.6	4	7.1	0.001
	Female	34	10.3	160	48.6	24	7.3	92	28.o	19	5.8	
Packed/Ready food	Male	18	32.1	9	16.1	5	8.9	16	28.6	8	14.3	0.289
	Female	89	27.1	93	28.3	20	6.1	71	21.6	56	17	
Fruit juices	Male	12	21.4	18	32.1	3	5.4	20	35.7	3	5.4	0.59
	Female	61	18.5	116	35.3	15	4.6	98	29.8	39	11.9	
Soft/Fizzy drinks	Male	19	33.9	10	17.9	6	10.7	12	21.4	9	16.1	0.447
	Female	115	35.o	62	18.8	15	4.6	72	21.9	65	19.8	
Tea/Coffee	Male	13	23.2	23	44.1	9	16.1	7	12.5	4	7.1	0.734
	Female	61	18.5	147	44.7	71	21.6	33	10.o	17	5.2	
Milk	Male	11	19.6	27	48.2	10	17.9	6	10.7	2	3.6	.010
	Female	78	23.7	142	43.2	19	5.8	73	22.2	17	5.2	

Table 3: *Dietary Preferences among Medical Students during COVID-19*

QUESTIONS	GENDER	NEVER		EVERYDAY		TWICE ADAY		2-3 TIMES A WEEK		1-2 TIMES A WEEK		p-value
During COVID-19		Count	%age	count	%age	count	%age	count	%age	count	%age	
Fresh fruits	Male	4	7.1	37	66.1	5	8.9	10	17.9	0	.o	0.771
	Female	24	7.3	202	61.4	40	12.2	56	17.o	7	2.1	
Raw vegetables	Male	11	19.6	24	42.9	3	5.4	16	28.6	2	3.6	.760
	Female	74	22.5	117	35.6	19	5.8	95	28.9	24	7.3	
Cakes and ice cream	Male	26	46.4	3	5.4	3	5.4	11	19.6	13	23.2	0.605
	Female	135	41.o	29	8.8	8	2.4	69	21.o	88	26.7	
Pasta and Rice	Male	11	19.6	7	12.5	7	12.5	24	42.9	7	12.5	0.038
	Female	43	13.1	85	25.8	16	4.9	133	40.4	52	15.8	
Bread/Cereal	Male	9	16.1	27	48.2	5	8.9	12	21.4	3	5.4	0.655
	Female	56	17.o	161	48.9	16	4.9	65	19.8	31	9.4	
Pulses	Male	10	17.9	13	23.2	2	3.6	27	48.2	4	7.1	0.368
	Female	35	10.6	96	29.2	23	7.o	142	43.2	33	10.o	
Pizza	Male	28	50.o	5	8.9	3	5.4	3	5.4	17	30.4	0.137
	Female	150	45.6	24	7.3	5	1.5	49	14.9	101	30.7	
Snacks	Male	21	37.5	14	25.o	5	8.9	8	14.3	8	14.3	.11o
	Female	94	28.6	100	30.4	12	3.6	84	25.5	39	11.9	
Packed/Ready food	Male	23	41.1	9	16.1	4	7.1	11	19.6	9	16.1	0.311
	Female	155	47.1	53	16.1	7	2.1	57	17.3	57	17.3	
Fruit juices	Male	13	23.2	26	46.4	4	7.1	10	17.9	3	5.4	0.486
	Female	57	17.3	134	40.7	23	7.o	81	24.6	34	10.3	
Soft/Fizzy drinks	Male	21	37.5	9	16.1	5	8.9	14	25.o	7	12.5	0.054
	Female	161	48.9	37	11.2	10	3.o	57	17.3	64	19.5	
Tea/Coffee	Male	21	37.5	20	35.7	8	14.3	4	7.1	3	5.4	0.052
	Female	64	19.5	139	42.2	71	21.6	35	10.6	20	6.1	
Milk	Male	8	14.3	32	57.1	12	21.4	2	3.6	2	3.6	.010
	Female	61	18.5	171	52.o	29	8.8	53	16.1	15	4.6	

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Impact of COVID-19 Pandemic on Teaching staff of various Educational Institutions of Punjab.

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Abstract

Objectives: To find out the impact of COVID-19 pandemic on teaching staff of various educational institutions of Punjab.

Methods: A cross-sectional study was conducted and data was collected via sharing the questionnaire with teaching faculty of different institutes of Punjab. Data was analyzed through SPSS.

Results: Out of 202 respondents, 50.5% were males and 49.5% teachers were females, 52% were preparing online classes and68.5% were facing connectivity issues during their class. Almost 80% weren't satisfied with the system of e-learning. 63% teachers experienced mental health issues and 72% teachers noticed study and health realated issues among their children.

Conclusion: The corona pandemichad a great impact on teachers. Majority of them were facing mental health issues, financial issues, connectivity issue during the online class and study and health related issues among their children.

Keywords: COVID-19, pandemic, e-learning, teaching community, mental health issues, financial problems

Introduction

Corona virus; a name familiar to almost everyone on this planet, has crippled the entire world. The virus originated in Hubei province of China, in the city of Wuhan in December 2019 and spread all across the globe, taking the shape of one of the worst pandemics mankind has ever witnessed.[1,3]The corona pandemic is of course not only a serious public health emergency, but also a social, political and economic emergency.[2]The pandemic had particular effects on the field of education as many institutions across the world had to be closed to avoid the spread. Closure of educational institutions had an impact on both teachers and students. Particularly teachers were the ones who were hit in the worst manner as they had to change mode of teaching from traditional face to face education to online classes in addition to facing other issues of socioeconomic significance.[3]

In Pakistan, like other countries, educational institutions have been closed since the beginning of the pandemic and teachers are transitioning through uncertain times as far as their professional lives are concerned. E-learning in particular has intensified the workload on teachers as they have to be online most of the day in order to prepare e-lectures and e-tutorials.[4] Online education is changing the way we approach teaching and learning.[5]E-learning newly introduced in Pakistan is complicating the process for many teachers and they are finding this platform difficult for teaching as they lack the required training for such uncertain times and lack of previous exposure to e-learning is adding fuel to the fire.[6] Also it's difficult to predict what the educational landscape will look like after the pandemic ends.[7] Sooner or later, globalization of e-learning is bound to happen, just as we have witnessed globalization of e-commerce, e-mail, and e-government. Thus, the quality of online education must be improved and perceived as important as traditional face to face classroom-based education. This will ensure recognition of e-learning on par with the traditional education.[5]

Pakistan's teaching community has always been

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financially underprivileged as their salaries are not always enough to meet monthly expenses and the condition has been aggravated since the beginning of COVID induced lockdown. As many teachers are employed by private sector, which due to closure of schools and colleges couldn't get monthly fees from their students, and so is unable to pay monthly salaries to their employee teachers.[8] So teachers are facing serious financial crisis during the pandemic especially those employed by private sector. The financial crisis coupled with misery of staying isolated at homes during lock down and worries regarding the future of their children is causing anxiety, depression and other serious mental health issues among teachers.[3] The lockdown and the virus itself as being the cause of death has major psychological impact on teachers which is further aggravated when a near and dear one contracts the virus. Teachers as parents also remain worried about the health and wellbeing of their children. This stress added to other stresses paces way to psychological issues.[9] The reason why our teachers, students and other persons concerned with the field of education are suffering during these critical times is the lack of investment and lack of proper attention to this field.[10] This rapidly developing psychological and financial issues among teachers and lack of teachers' training regar-ding online education need to be addressed in a more detailed manner.[11] Keeping in view all these factors, the main objective of this study was to find out the impact of COVID-19 pandemic on teaching staff of various educational institutions of punjab.

Methods

A cross-sectional study was conducted among facul-ties of different institutes of Punjab using pre-tested questionnaires. The online survey form consisted of questions related to major issues faced by teachers' community and their families during the corona pandemic. Data was collected via sharing the ques-tionnaire with teaching faculty of different institutes of Punjab. Sample pool consisted of total 202 respondents with 102 males and 100 female teachers. The data was analyzed by using the software statis-tical package for social science, SPSS. Results were presented into frequency and percentages.

Results

The study was conducted to illustrate impact of COVID-19 pandemic on teaching faculty of different educational institutes of Punjab. Response of total 202 teachers was recorded. Of the 202, 50.5% (n= 102) respondents were male and 49.5% (n=100) respondents were female.Male to female ratio (MTF ratio) was 1.02:1. Age distribution was also studied among the respon-dents. 5.4% (n=11) were below 25 years of age, 27.7% (n=56) were between 25-30 years, 20.8% (n=42) between 30-35 years, 11.9% (n=24) between 35-40 years, 5% (n=10) between 40-45 years and 12.4% (n=25) were between 45-50 years of age. Remaining 16.8% (n=34) were above 50 years of age. This is shown in the figure 1.
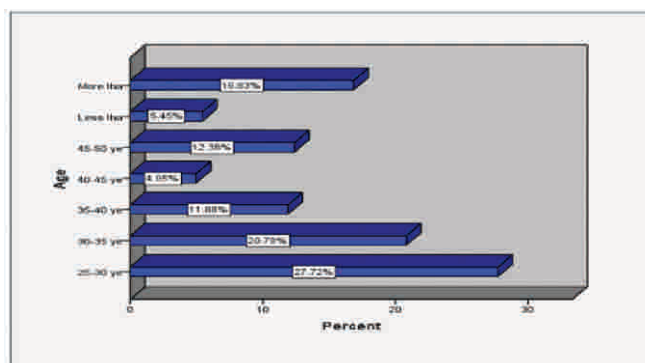
Figure 1: *Age Distribution of Study Participants*

Marital status was also studied in the teaching faculty of different institutes. 72.3% (n=146) teachers were married and 27.7% (n=56) teachers were unmarried. Residential setting of different teachers was also recorded to illustrate major issues faced by them. 83.7% (n=169) respondents were from urban setting while 16.3% (n=33) were from rural residential setup. Employment status was also noticed in the responding individuals.65.3% (n=132) were government employees while 34.7% (n=70) were doing jobs in private institutes.

Figure 2 shows that 85.64% (n=173) teachers were getting paid while 14.36% (n=29) weren't getting their monthly pay during the corona pandemic.
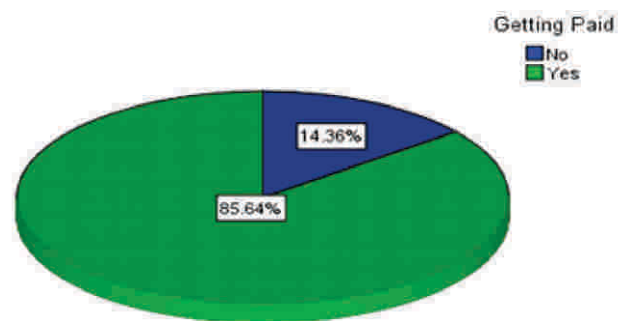
Figure 2: *Grouping of Participants on the Basis of being Paid or not.*

52% (n=105) teachers were having online classes. Among those teachers who were preparing online classes during the pandemic, 24.7% (n=50) were doing government jobs and 27.2% (n=55) were from private institutes. 48% (n=97) teachers weren't preparing any class for their students in the pandemic. Among those, 40.6% (n=82) were government employees while 7.4% (n=15) teachers were from private institutes.

It was also asked from the teachers preparing online classes, what kind of class do they having? 66.7% (n=70) were having proper online lectures, 12.3% (n=13) were sharing only PowerPoint slides with their students and 21% (n=22) teachers were preparing recorded video lectures for their students. This is shown in table 1.

Table 1: *Types of Online Classes Taken by Teachers*

What kind of Class?	Count	Percentage
Proper Online Class	70	66.7%
PowerPoint Slides	13	12.3%
Recorded Video Lectures	22	21%
Total	105	100%

Among the teachers preparing online classes, 68.5% (n=72) were facing connectivity issues during their class while 31.4% (n=33) weren't facing any such issue.

It was also asked from the teachers whether they were satisfied with the online system of education or not. 20.8 % (n=42) teachers were satisfied with the system while 79.2% (n=160) teachers weren't satisfied at all. This is illustrated in the figure 7.

Figure 3 shows that 14.9% (n=30) teachers got infected with the virus while 43.6% (n=88) labelled them save from the virus. Remaining 41.6% (n=84) doubted that they may have contracted the virus.
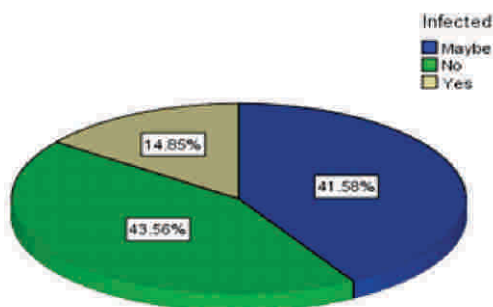
Figure 3: *Participants Grouping on the Basis of Presence and Absence of Infection*

62.9% (n=127) teachers noticed anxiety, depression and other mental health issues in them during lockdown while 37.1% (n=75) respondents didn't notice any such issue.

Table 2 shows that among the married teachers having kids, 72.6% (n=106) teachers noticed study and health related issues among their children while 27.4% (n=40) teachers didn't noticed any such issues.

Discussion

The study aimed at collecting data to describe and explore the concerns of teaching staff of various

Table 2: *Effect of COVID-19 on Children of the Study Participants*

Noticed bad effects on children	Count	Percentage
Yes	106	72.6%
No	40	27.4%
Total	146	100%

institutes of Punjab regarding the current circumstances of lockdown and social distance. Total 202 teachers recorded their responses. 50.5% were males and 49.5% respondents were females with MTF ratio of 1.02:1. Almost half of the respondents were in the age range of 25 to 35 years. 72% teachers were married and almost 84% were from urban setup. 65% of them were doing government jobs while 35% were from private institutes. 85% teachers were getting their monthly pay and 15% respondents weren't getting any pay in the lock down. Those not getting paid were mostly from private sector and must be living from hand to mouth to fulfill their basic needs.

Almost 52% respondents were having online classes during the pandemic. Remaining 48% teachers weren't preparing any class for their students. Among those who weren't preparing online classes, majority were from government institutes. This shows lower standard of education and lack of proper facilities for arranging online classes in government institutes. It was also asked from the teachers preparing e-lectures for their students, what kind of online class were they having? 66% of them were arranging proper online lectures for their students on daily basis. Almost 21% teachers were preparing recorded video lectures for the ease of the students while remaining 13% were preparing only PowerPoint slides. Among the teachers preparing online classes, 68.5% were facing connectivity issues during their class which shows poor status of modern technology in our country. Major problem faced by them was the connectivity issue during the online class which should be properly addressed. Although e-learning has evolved much in the recent times, teachers as well as the students are

still in the process of getting acquainted with it. It was also asked from the teachers whether they are satisfied with this online system of education or not. Almost 80% teachers responded with a big 'no' as they were totally unsatisfied with the current system of education. This is in contrast with the study conducted at Melaka Manipal Medical College, Malaysia12in which 65% faculty members held positive opinion towards e-learning. Among the respondents, 14.9% teachers said that they got infected with the virus while 43.6% labelled them save from the virus. Remaining 41.6% doubted that they may have contracted the virus. The pande-mic also had a psychological impact on the teachers. Majority of them noticed serious health issues among them like anxiety, depression and other mental health problems. Teachers as parents also showed concerns about their children. 72% teachers noticed study and health realted issues among their children which also added to their stress during this period of isolation.

Conclusion

The study was aimed at highlighting impact of COVID-19 pandemic on teaching staff of various institutions of the country especially Punjab. Teachers face many issues as they have to prepare classes for their students during the pandemic. Majority of teachers were unsatisfied with e-learning during lockdown. Social isolation also posed a psychological impact on the teachers. Most of them experienced issues related to their mental health and wellbeing. Teachers as parents also showed major concerns about the health and studies of their children. Financial problems were also faced by many of the teachers as closing their working institutes have deprived them of their monthly salaries. So, in general, teacher's community had a difficult time during this lockdown.

Education is a matter of life and death for any nation and teachers are the one who lead a nation to the highest levels. This is high time to address these issues to support our teachers in difficult times so that they are able to sustain their lives during this calamity .Government should make sure that private institutions pay their employees at least 70% of their monthly salaries and there should be a bail-out for private educational institutions to prevent them from shutting down. Moreover, teachers should also be

trained for e-learning as the world is progressing very fast and there is a need to adapt to this rapidly advancing world. There is a need to establish a proper platform where issues related to teachers can be raised and discussed to devise ways to solve them in the welfare of teachers, and in true sense, in the welfare of the nation.

Author's Contribution

QM, UJS: Study design, data collection, literature review.
RRA: Manuscript writing.
RKA: Data analyzed and interpretation.
FI: Drafting, revision and find approval.
TA: References writing and checking.

Conflict of Interest: None

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Hygiene Related Hand Eczema During COVID-19 Pandemic

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Abstract

Objective: To determine the frequency and pattern of hand eczema in patients practicing hand hygiene during Covid-19 pandemic

Methods: This cross sectional study was carried out at Department of Dermatology unit1, Jinnah hospital, Lahore. A total of 150 patients observing hand hygiene practices in the form of hand washing and application of alcohol based hand sanitizers were enrolled after informed consent. Frequency of hand washing and application of sanitizers was asked. Patients were examined for presence of hand eczema and associated signs and symptoms such as erythema, itching, scaling, vesicles, dryness, fissuring, lichenification and sago-grain appearance were noted. All information was recorded on a predesigned proforma.

Results: The mean age of the patients was 33.25+ 8.37 years. There were 81 (54%) females and 69 (46%) males. Among these 83 (55.3%) were healthcare workers and 67 (44.6%) were general public. Out of 150 patients hand eczema was seen in 126 (84%) patients with history of frequent daily hand washing and use of sanitizer. Most of the patients presented with scaling (89%), itching (86.5%) dryness (76.1%) and erythema (68.2%). Previous history of contact dermatitis and atopy was found in 20.6 % and 15.3 % of hand dermatitis patients respectively.

Conclusion: Hand sanitation practices during Covid-19 pandemic cause increased frequency of hand eczema. As hand hygiene cannot be compromised during the pandemic therefore patients need to be given guidelines to prevent or minimize hygiene related skin damage.

Keywords: hand washing, hand sanitizer, hand dermatitis, Covid 19

Introduction

The Covid-19 pandemic is the most serious health crisis of modern times.[1] It is a highly contagious disease transmitted between people through respiratory, contact and aerosol routes.[2,3,4] Respiratory droplet transmission occurs directly when a person is in contact with infected person through breathing, talking, coughing and sneezing leading to a human atomization of virus particles.[3,4] It also occurs indirectly through contact with viral particles deposited on surfaces and objects in vicinity of an infected person. Large droplets settle on objects and persons leading to their contamination while aerosols are dispersed in air. Direct and indirect contact route transmissions occur over a short range while airborne transmission occurs over extended distance.[3,4]

World Health Organization and other major health authorities have recommended frequent hand washing with soap and water or use of alcohol based sanitizers to prevent the spread of the infection. According to United Nations International Children's Emergency Fund, hand washing is the easiest, cheapest and most important way to prevent spread of infection.[5] However these hygiene recommendations lead to adverse dermatological effects like skin dryness, irritant contact dermatitis and allergic contact dermatitis.[6] Prolonged exposure to water causes swelling of stratum corneum, disruption in intercellular lipids along with increased skin permeability and sensitivity of skin to physical and chemical irritants.[7] Excessive hand sanitization with soap and alcohol based product also causes disruption of skin flora and damages natural skin barrier so irritants

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and allergens can easily penetrate the skin leading to dermatitis.[6,8] It subsequently leads to activation of skin immune system, release of pro-inflammatory cytokines and delayed-type hypersensitivity reactions.[9] Symptoms include dryness, roughness, itching, burning, erythema, edema, blistering, scaling, and fissuring.[6] Soaps, detergents, solvents and surfactants damage skin proteins and epidermal keratin, depletes skin lipids and alter cell membrane of keratinocytes. Their frequent use can lead to cumulative irritant contact dermatitis.[10] Patients with family or personal history of atopic dermatitis have increased sensitivity towards skin irritants as they have chronically dysfunctional skin barrier. Hand hygiene-related products may rarely cause allergic contact dermatitis. Frequent use of alcohol based sanitizer can also cause skin dryness and irritation.[9]

A high incidence of hand hygiene-induced skin damage was reported in COVID-19 healthcare workers in China. Out of 434 healthcare workers in Hubei province, 74% (321) were frequent washers performing hand hygiene more than ten times per day, and among these 76.6% (246) reported hand skin damage with dermatitis symptoms.[6] There are also reports of increased consultations during the pandemic for hand eczema from India and Italy. An Indian study reported 16 patients of hand eczema over a short span of 10 days due to excessive use of hand sanitizers/ handwashing.[11]

The presence of hand eczema itself can lead to decrease in adherence to hand hygiene practices. This may lead to an increased risk of infection. Moreover any breach in skin continuity consequent to contact dermatitis allows SARS-CoV-2 to gain entry as the cell receptor for SARS-CoV-2 entry (i.e. angiotensin-converting enzyme 2) is present in large quantities in the blood vessels of the skin, basal layer of the epidermis, and hair follicles.[11,12]

The present study was planned to identify the frequency and patterns of hand eczema due to hygiene related practices during the current pandemic. As hand hygiene cannot be compromised due to risk of transmission of a serious infection therefore guidelines need to be devised for prevention or minimization of hygiene related dermatitis while not compromising on the safety.

Methods

This cross sectional survey was done at dermatology unit 1, Jinnah hospital, Lahore after approval from the ethical review board. Patient information and identification were kept confidential. The study population included both health care professionals and general public.

A total of 150 patients were enrolled. After informed consent basic information regarding gender, age, occupation, and clinical history of previous dermatitis and atopic diathesis were obtained. The details of hand hygiene practices adopted were noted i.e. frequency of hand washing and frequency of sanitizer application. The hands were examined in good light for presence of hand eczema and associated signs and symptoms particularly erythema, itching, scaling, vesicles, dryness, fissuring, lichenification and sago-grain appearance.

Results

Our study included 150 patients with a mean age of 33.25+8.37 years. There were 81 (54%) females and 69 (46%) males. Among these 83 (55.3%) were healthcare workers while 67 (44%) were general patients (Table 1). Hand eczema was identified in 126 (84%) patients. Out of these 71 (56.34%) were healthcare workers (Table 2). Scaling was present in 113 (89.65%) patients, followed by itching in 109 (86.5%), skin dryness 96 (76.1%), erythema 86 (68.2%), vesicles 30 (23.8%), sago-grain like appearance 15 (11.9%), fissuring 11 (8.7%) and lichenification in 5 (3.9%) patients. Overall frequency of daily hand washing and use of hand sanitizer was increased and correlated positively with the frequency of hand eczema (Table 3). Atopy was present in 23(15.3%), out of which 21(91%) presented with hand eczema whereas history of previous dermatitis was present in 31 (20.6%) patients and out of these 26 patients(83%) developed hand eczema. Thus hygiene related hand eczema was significantly more common in atopics and those with previous history of dermatitis (p value<0.05).

Table 1: *Characteristics of Study Sample*

Characteristics	Patients n=150
Age (years)	33.25±8.37
Gender	
• Males	69 (46%)
• Females	81 (54%)
Profession	
• Healthcare Workers	83 (55.3%)
• Non Healthcare Workers	67 (44.6%)
Positive history of Atopy	23 (15.3%)
Positive history of previous hand eczema	31 (20.6%)

Table 2: *Frequency of Hand Eczema among Healthcare Workers (HCW) and non-HCW*

	Total patients n =150 n(%)
Hand eczema	126 (84%)
Among healthcare worker	71 (56.34%)
Among non health workers	55 (43.65%)

Table 3: *Daily Frequency of Hand Washing and use of Sanitizer*

Daily frequency (Times per day)	Frequency of Hand washing n (%)	Frequency of use of hand sanitizer n (%)
< 5	17 (11.33%)	22 (14.6%)
5 – 10	28 (18.6%)	34 (22.66%)
10 -15	31(20.6%)	41 (27.33%)
15 – 20	74 (49.33%)	53 (35.33%)

Figure – 1 *Scaling*

Figure – 2 *Erythema & Fissuring*

Figure – 3 *Sago-Grain Sppearance*

Discussion

Although the number of COVID cases has declined over the last few weeks the novel nature of the virus has led to a great uncertainty around the world on predicting when this pandemic will end.[13] Till now there are no clinically approved treatments available and in the absence of an effective vaccine or treatment, the scenario is expected to prolong. The only option left is to follow preventive measures recommended by WHO.[14] However these measures can cause hand eczema which needs to be identified and avoided along with advice for proper hand care regimen without compromising safety and reducing risk of transmission of infection.

The present study was planned to identify the frequency and patterns of hand dermatitis as a result

of hand hygiene promoted during the current pandemic situation. The mean age of patients in our study was 33.25+-8.37 years. There was a slight female dominance in our study as 81 (54%) patients were females. Anne et al also observed a female dominance of 61.4% patients.[8] This is also in accordance with other studies showing that hand eczema is more common in females.[15] In our study out of 150 patients, 83 were healthcare workers (55.3%). Among health workers eczema was reported in 71 out of 83 (85.5%) patients. Previous studies have also revealed that hand eczema is more common in health care workers and the risk factors include more rigorous hand hygiene routines and wearing gloves for a long time.[16]

The present study revealed increased frequency of hand washing in the study population. Majority of them i.e. 74 (49.33%) patients were washing hands 15-20 times per day. This was comparable to another study by Anne et al where 38.9 % patients were washing their hands 10-20 times per day.[8] Our data revealed that 53 (35.33%) patients were using hand sanitizers 15-20 times daily. Increased overall frequency of hand disinfectant application has also been noted by Anne et al where 35.4% patients were applying disinfectant 10-20 times daily.[8]

In our study out of 150 patients with history of frequent hand washing and use of sanitizer 126 (84%) reported hand eczema. A higher incidence of 90.2% was also reported from Germany that correlated with a two times an increase in the frequency of hand washing during the COVID-19 pandemic.[11] Regarding the signs and symptoms, scaling was observed in 113 patients (89.65) followed by itching in 109(86.5 %), skin dryness in 96 (76.1%) and erythema in 86(68.2%) patients. Other patterns included vesicular lesions in 30 (23.8), sago-grain like appearance in 15 (11.9%), fissuring in 11 (8.7%) and lichenification in 5 (3.9%) patients. Our findings add to the current data of Anne et al also showing high prevalence of symptoms associated with acute hand dermatitis (90.4%) among health care workers in which dryness was reported in 83.2% followed by erythema 38.6%, itching 28.9%, burning 21.1%, scaling 18.4%, fissures 9.6% and pain in 4.4% patients.[8] Lan et al also reported an increasing onset of skin damage of hands in 74.5% of 526 covid-19 healthcare workers.[16] Atopic dermatitis is a factor significantly related to

severity of hand eczema.[17] Our results also highlighted this fact. Atopy was present in 23(15.3%) of all patients, out of which 21(91%) presented with hand eczema.

Following the hand hygiene recommendations is essential in preventing the spread of COVID-19 and, under no circumstances, should be compromised by the eczematous changes that may occur in the hands. By providing preventive guidance to patients, dermatologists can help to limit the adverse cutaneous effects associated with hygiene practices in the community.[6] The following skin care tips may help prevent and manage hand dermatitis consequent to frequent cleansing:

1. Use of a mild moisturizing soap and lukewarm water for washing hands is recommended. Use of harsh, medicated and antiseptic soaps should be discouraged as they have no added benefit and contribute significantly towards development of eczema.

2. After washing dry the hands gently without causing physical irritation to prevent chafing.

3. Applying moisturizing skin care products after hand cleansing is the essential step in keeping the skin hydrated and preventing further damage. Thick and greasy preparations like white petroleum jelly are more effective than creams and lotions. Products should be fragrance free to prevent contact sensitization and should be applied liberally multiple times a day.

4. When soap and water are not available, the CDC advises the use of alcohol-based hand sanitizers (containing at least 60% alcohol). Since these can be irritating, it is important to hydrate the skin immediately after. Applying a moisturizing cream afterward does not interfere in any way with the properties and efficiency of this type of sanitizers.[9]

5. Topical corticosteroids may be used to reduce the signs and symptoms of inflammation in severe cases of hand dermatitis.

Conclusion

Hand sanitation practices during Covid-19 pandemic cause increased frequency of hand eczema. However compliance with hand hygiene recommendations is essential in preventing the spread of COVID-19 and,

under no circumstances, should be compromised by the eczematous changes that may occur in the hands. The awareness and practice of preventive measures can reduce the chances of hand eczema. The potential development of hand dermatitis is preventable and manageable by using appropriate skin products. Dermatologists should counsel patients on strategies to combat skin damage and limit the adverse effects associated with changing hygiene practices in the community.[6]

Author's Contribution

RM, LMM, WH: Concept data collection, analysis, write up.
ZN, AS: Data collection, analysis.
TR: Concept, analysis, write up.

Conflict of Interest: None

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To Determine Safety Profile of Azithromycin in Covid-19 Patients: A Cross Sectional Survey

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Abstract

Objective: Covid-19 outbreak late in 2019 from Wuhan city of China spread rapidly all over the world and became a pandemic. Corona Virus is RNA virus, major virus that affects respiratory system and can result in acute respiratory distress syndrome, so there emerged several management strategies to combat the challenge of the disease, Azithromycin is one of those treatment options. Azithromycin have been used widely and generally considered as safe medication. The Purpose of this study was to establish its safety profile in this new disease in our part of world.

Methods: 80 covid-19 positive in ICU were given Azithromycin along with other standard treatment, Side effects were divided into mild serious and allergic reactions. These were noted down in pre designed proforma. Data analysis was done in SPSS version 25.

Results: 80 patients were studied 38 (46.2%) patients experienced side effects , majority of which were mild in nature, Out of 80 patients Abdominal Pain was 37.5% , diarrhea 22.7% nausea 25%, transaminitis 2.5%, anorexia 26.3%, taste perversion 36.3% , dyspepsia 15%, vomiting 17.5% , headache 6.3% and somnolence 1.3% . Only 1 (1.25%) patients had arrhythmia and 1 (1.25%) had urticaria that was successfully treated.

Conclusion: After this study this can be concluded that Azithromycin is safe drug as majority of side effects experienced were mild in nature and it can be safely used to treat Covid-19 positive patients.

Key words: 2019-nCoV, Azithromycin, SARS-CoV-2. COVID-19.

Introduction

The Wuhan City of China experienced COVID-19 outbreak for the first time late in December 2019, Which spread rapidly in China and then worldwide in 209 countries, became a pandemic, it has been treated as pneumonia with unknown etiology.[1,2] One of the major target of corona virus is respiratory system of the humans.[3] It was named as 2019-nCoV by Chinese experts[4] and Later, it was named by the International Committee on Taxonomy of Virus as Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2).[5]

Rapid and accurate detection of COVID-19 is crucial to control outbreaks in the community and in hospitals.[6] Current diagnostic tests for coronavirus include reverse-transcription polymerase chain reaction (RT-PCR), real-time RT-PCR (rRT-PCR), and reverse transcription loop-mediated isothermal amplification (RT-LAMP).[7]

The need of an hour is to find effective therapeutic agents for the treatment of COVID-19 whether inpatient or outpatient as the devastating effects of the coronavirus designated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) demands an urgent attempt to combat situation.[8]

It has been demonstrated by few studies that hydroxychloroquine sulfate (HCQ) inhibits SARS-CoV-2 in vitro[9] and one of study proves that the combination of HCQ and azithromycin (AZ) inhibits SARS-CoV-2 in vitro.[10]

Azithromycin is a macrolide antibiotic it has a struc-

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ture modified from erythromycin. Like other macrolides, azithromycin has activity against Moraxella catarrhalis and Streptococcus pneumoniae and and also against atypical pathogens, like Mycoplasma pneumoniae, Chlamydia pneumoniae and Legionella pneumophila.[11] It has been showing activity against Zika and Ebola viruses in vitro and has immunomodulatory action as demonstrated by in vivo activity in the prevention of severe respiratory tract involvement in viral infections.[12] Azithromycin works by inhibiting protein synthesis and experimentally reduces viral replication and inflammation possibly because viruses and cytokines are both made of proteins and use cellular ribosomes for protein translation. In addition, inhibiting virus production can reduce viral transmission to others, which is an important additional benefit.[13]

Azithromycin has been used widely and is generally considered a safe antibiotic. Th however, occasional adverse effects may occur[13] like with almost all antibiotics, gastrointestinal symptoms like Nausea, vomiting, diarrhea and headache may ensue, like so occasional urticaria and few other skin eruptions. Serious side effects are uncommon; however, they may occur, including cardiac arrhythmias, which happen especially in the elderly and in those patients with preexisting QT interval prolongation, bradycardia, low serum magnesium or potassium, and in individuals who are taking certain antiarrhythmic drugs.[13,14] However in the search for a safe and effective treatment of individuals with mild or moderate COVID-19, azithromycin remains one of the most promising.[15]

Objective

The objective of this study is to determine the safety profile of azithromycin in our part of world it may open room for further research as regards treatment of novel corona virus and may establish azithromycin as safe and effective in treatment of Covid-19 positive patients of Asian ethnicity.

Methods

This Cross Sectional Survey was performed in Intensive Care Unit of Services Hospital Lahore, from1st May to 31st July. Eighty (80) patients were taken through Non probability purposive sampling. Patients were taken according to inclusion criteria that is Covid-19 PCR patients admitted in ICU, Both genders included, Age range was 18 to 85 years, and all grades of severity of disease were included.

The patents who has Documented known allergy to Macrolides. Females who were pregnant, those with prolonged QT interval documented on Baseline ECG. Patients receiving other medicines that are likely to prolong the QT interval and those with a history of arrhythmias, torsade's de pointes or uncompensated cardiac failure, were excluded from study

After Ethical Committee approval of the proposal of the study, patient according to inclusion and exclusion criteria were recruited. After taking informed consent, all patients received a standardized clinical examination, all baseline and specific investigations according to their clinical condition and Baseline ECG at day 0 and they were regularly followed up daily during their stay in hospital. All of them given Tab Azithromycin 500mg oral daily, they were observed and asked questions regarding side effects of Azithromycin and side effects were noted down on tenth day.

The Side effects has been divided in three major groups, Mild Side Effects, Serious Side effects and Allergic Reactions. All findings and self-reported side effects were noted down in pre designed proforma.

Data Analysis was done with SPSS version 25.0, that was used to enter and analyzed the data. Quantitative data like age were presented as means and standard deviation and qualitative data like gender, diarrhea was presented as frequency and percentages.

Results

Eighty (n=80) patients presented to Covid ICU were studied, all of them were given Azithromycin 500mg daily orally. Their demographic profile is shown in Table 1, there were 56 (80%) male and 24(30%) female patients. Mean Age was 54.9 + 11.28 with Minimum 27 and Maximum 85 years , Out of which 11 (13.7%) were in 18-40 year age group, 46 (57.5%) in 41-60 year age group, 22 (27.5%) in 61-80 years age group and 1 (1.25%) in > 81 year group. All patients were Covid PCR positive 80(100%) and only 4 (5%) were smokers. (Table 1)

Out of 80 patients 11(17.5%) were having mild to

Table 1: *Demographic Profile of Patients*

Total No. Patients (n)		80
Male		56 (70%)
Female		24 (30%)
Age Group	18-40	11 (13.7%)
	41-60	46 (57.5%)
	61-80	22 (27.5%)
	≥ 81	1 (1.25%)
Covid-19 PCR		80 (100%)
Smokers		4 (5%)

moderate Disease, 50(62.5%) patients had sever disease and 16 (20%) were critical. (Table 2)

Table 2: *Clinical Severity*

Mild To Moderate Disease	14(17.5%)
Sever Disease	50 (62.5%)
Critical Illness	16 (20%)

Out of 80 patients 38 (46.2%) suffered from Side effects, of which 36 (45%) out of 80 and 94.7% out of 38 had Mild Side effects, 1(1.25%) out of 80 and 2.6% out of 38 patient had Sever Adverse reaction and 1(1.25%) out of 80 and 2.6% out of 38 patient had Allergic reaction .Table 3(a)

Table 3(a): *Side Effect Profile of Azithromycin in 80 Patients*

1	**Occurrence Of Adverse Events**	**38 (46.2%) out of 80 patients**
2	Mild Side Effects	36 (45%) out of 80 and 94.7% out of 38
3	Sever Adverse Events	1(1.25%) out of 80 and 2.6% out of 38
4	Allergic Reaction to Azithromycin	1(1.25%) out of 80 and 2.6% out of 38

Amongst Patients having mild side effects 30(37.5%) out of 80 and 78.9% out of 38 had Abdominal Pain. 22(27.5%) out of 80 and 57.8% out of 38had Diarrhea,

20(25%) out of 80 and 52.6% out of 38 had Nausea, 2(2.5%) out of 80 and 5.2% out of 38 had Elevated ALT AST, 21(26.3%) out of 80 and 55.2% out of 38 had Anorexia, 29(36.3%) out of 80 and 76.3% out of 38 experienced Taste perversion

12(15%) out of 80 and 31.5% out of 38 had Dyspepsia.14(17.5%) out of 80 and 36.8 % out of 38 had Vomiting. 5(6.3%) out of 80 and 13.1% out of 38 had

Headache. 1(1.3%) out of 80 and 2.6% out of 38 had Somnolence.

Table 3(b): *Side Effect Profile of Azithromycin*

	Mild side effects	
1	Abdominal Pain	30(37.5%) out of 80 and 78.9% out of 38
2	Diarrhea	22(27.5%) out of 80 and 57.8% out of 38
3	Nausea	20(25%)out of 80 and 52.6% out of 38
4	Elevated ALT AST	2(2.5%) out of 80 and 5.2% out of 38
5	Anorexia	21(26.3%) out of 80 and 55.2% out of 38
6	Taste Perversion	29(36.3%) out of 80 and 76.3% out of 38
7	Dyspepsia	12(15%) out of 80 and 31.5% out of 38
8	Vomiting	14(17.5%) out of 80 and 36.8 % out of 38
9	Headache	5(6.3%) out of 80 and 13.1% out of 38
10	Somnolance	1(1.3%) out of 80 and 2.6% out of 38
Serious Adverse Reaction		
11	Arrythmia	1(1.25%) out of 80 and 2.6% out of 38
12	Hypotension	None
13	QT Prolongation	None
14	Torsade's de Point	None
15	Renal and Hepatic Failure	None
16	Convulsions	None
17	Neutropenia, Leucopenia and Thrombocytopenia	None
Allergic Reactions to Azithromycin		
18	Arthralgia	None
19	Edema	None
20	Urticaria	1(1.25%) out of 80 and 2.6% out of 38
21	Angioedema	None

Only 1(1.25%) out of 80 and 2.6% out of 38 had Arrythmia as serious adverse event and 1(1.25%) out of 80 and 2.6% out of 38 had Urticaria, Amongst Allergic reaction. Table 3(b)

Out of 80 patients, 38 (47.5%) had Co Morbid Conditions in the form of Diabetes 28 (35%) out of 80 (73.6% out of 38). Hypertension was present in 19 (23.7%) out of 80 (50% out of 38) and 5(6.25%) out of 80 (13.1% out of 38) had Ischemic Heart Disease. Table 4.

Table 4: *Co Morbid Conditions*

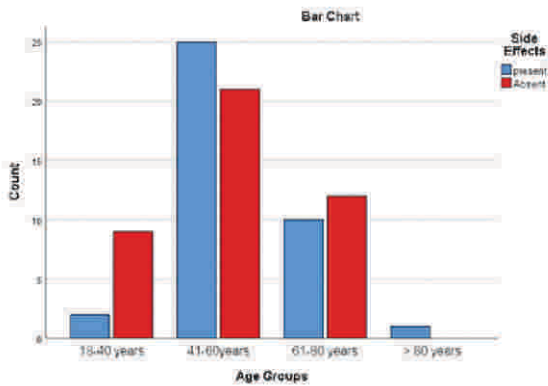| 1	**Co Morbid Conditions**	**38 (47.5%) out of 80**
2	Diabetes	28 (35%) out of 80 and 73.6% out of 38
3	Hypertension	19 (23.7%) out of 80 and 50% out of 38
4	Ischemic Heart Disease	5(6.25%) out of 80 and 13.1% out of 38

Figure 1: *Showing Frequency of Side Effects According to Age Groups*

Figure 1 is bar chart showing frequency of occurrence of side effects was more in Age group 41-60 years that is 25 patients. 2 patients from 18-40 years, 10 from 61-80 years and 1 from > 81 years experienced adverse reaction.

Discussion

Azithromycin is a broad-spectrum macrolide antibiotic having bacteriostatic activity against many Gram-negative and Gram-positive bacteria[16] Azithromycin is the prototype of an antimicrobial agent which falls in the class of azalides derived from the macrolides[17] Azithromycin has good tolerance in general, but relatively common adverse effects (1–5 % of patients) include gastrointestinal upset, headache and dizziness.[18]

Compared to study done by Barbara A. Brown Mean age was 66 years compared to 54.9 in our study. He noted adverse events in 33 of 39 patients (85%) while receiving Azithromycin compared to 38(46.2%) patients in our study which is quite less. The majority of these were GI events (82%) in Barbara's study, GI symptoms included diarrhea (62%) compared to (27.5%) in ours, abdominal pain (41%) compared to (37.5%) in ours, anorexia (33%) compared to (26.3 %) in ours, unusual taste sensation (33%) compared to (36.3%) in ours, nausea (28%) compared to (25%) in ours , vomiting (18%) compared to (17.5%) in ours and abdominal bloating or dyspepsia (~IO%) compared to (15%) in our study.[19]

The retrospective cohort study was performed using national Department of Veterans Affairs' administrative data, it did not reach statistical significance in regards cardiac arrhythmias (25.8 vs 26.0%; OR:

0.99, 95% CI: 0.95 – 1.02) compared to only one patient (1.25%) having Arrhythmia in our study.[20]

Hence it is demonstrated that generally, Azithromycin remained safe drug option to use in covid positive, ICU admitted patients in Pakistan, majority of side effects were mild and tolerable and resulted in completion of antibiotic course, one patient had episode of arrhythmia, he had multiple co morbid conditions as well, that episode was successfully treated and does not resulted in fatality.

Further research with larger sample size however will definitely enable us to better manage this potentially fatal Novel Corona Virus.

Conclusion

After this study this can surely concluded that Azithromycin is a safe drug as demonstrated by results only 38 (46.2%) out of 80 patients experienced side effects , majority of which were mild in nature. Only 1 (1.25%) patients had arrhythmia and one (1.25%) has allergic reaction that was successfully treated.

Author Contributions
SZ, MI: Data compilation and writing
MJA: Review Article
MH, SMAN, AM: Data Collection

Conflict of Interest: None

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COVID-19 Awareness Among Medical Students of Different Universities of Pakistan

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Abstract

Objective: To evaluate the awareness about COVID-19 among medical students of different universities of Pakistan.

Methods: It is a cross sectional study. In which we assessed the awareness of 254, 3rd year and 4th year medical students of King Edward Medical University and Rashid Latif Medical college about novel COVID-19 disease during this current pandemic. The surveillance of this awareness among 254 medical students about COVID-19 was done through a KAP study. An online questionnaire was used to collect the demographic details, knowledge, attitude towards the disease and practices of the medical students.

Results: All the 254 students of KEMU and RLMC had good knowledge about COVID-19, its symptoms, incubation period, disease fatality and prevention.99.6% students were well aware about source of infection and its route of transmission.55.5% students were satisfied with the precautionary steps taken by the government while 86.6% were afraid to go to the crowded places and 63% believed that there is stigma associated with COVID-19 pandemic.75.6% always used Soap/Hand Gel to wash hands for 20 seconds and 87.8% always ensured that mask fits properly and covers nose and mouth completely. About 96.9%avoid normal daily life activities.

Conclusion: This study concludes that majority of the medical students have good knowledge, positive attitude and sufficient practices. But practices of hand hygiene, mask usage and social distancing should be emphasized. Medical students play a vital role in society as they can educate public about the pandemic and its precautions to prevent further spread of the disease. Hence, continued efforts are required to strengthen knowledge, attitude and practices towards COVID-19, so that Pakistan can win the battle against this pandemic.

Key Words: COVID-19, Pandemic, Attitude, Practices, Awareness

Introduction

Since late December 2019, an outbreak of novel coronavirus disease (Covid-19; previously known as 2019-nCov) was reported in Wuhan, China, which has subsequently affected 215 countries so far. The people affecting with this novel virus is increasing day by day.[1] Epidemiological investigations have sugges-ted that the outbreak was associated with a seafood market in Wuhan.[2]

In general, COVID-19 is an acute resolved disease but it can also be deadly with a 2% case fatality rate. Severe disease onset might result in death due to massive alveolar damage and progressive respiratory failure.[3] Although most coronavirus infections are mild, the epidemics of two betacoronaviruses, severe acute respiratory syndrome (SARS-CoV) and middle east respiratory syndrome (MERS-CoV) have caused more than 10,000 cumulative cases in the past two decades with mortality rates of 10% for SARS-CoV and 37% for MERS-CoV.[4]

The pandemic of SARS cov-2 is a condition charac-terized by array of symptoms leading to acute respi-ratory distress syndrome.[4] Common symptoms are

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fever, cough, myalgia, less common symptoms were sputum production, headache, loss of taste/smell, nausea/vomiting, diarrhea. Some patients develop dyspnea and lymphopenia. According to a recent study in New York study, most common presenting symptoms were cough(79.4%), fever(77.1%), dyspo-nea (56.5%), myalgias (23.9%), nausea and vomiting (19.1%).Most of the patients (90%) had lymphope-nia, 27% had thrombocytopenia and many had elevated liver function tests and inflammatory markers.[5] Real time RT PCR is used to diagnose the cases of COVID-19 disease.[6]

The pathogen responsible for covid-19 disease was suspected to be from the family of enveloped, posi-tive sense RNA viruses, characterized by club shaped spikes that projections from their surface, an unus-ually large RNA genome and a unique replication strategy.[7] Multiple trials are going on to discover definitive treatment modalities of this novel disease as well as its vaccine.

Governments are rapidly mobilizing to minimize transmission of COVID-19 disease with the measures of social distancing and travel restrictions to reduce fatalities and spread of this disease. The pandemic's progression and its impact is strongly related to the demographic composition and population especially its age structure. Older ages are more prone to this disease resulting in mortalities.[8]

To defeat coronavirus, in addition to public health measures, different policies of government like effective containment helped to lower down the expo-nential spread of this deadly virus.[8]

The purpose of this study is to evaluate the awareness of undergraduate medical students (3rd and 4th year MBBS) about novel COVID-19 disease. As being health professionals, they have to guide the public about its precautions and management.

Methods

It is across sectional study. In this study, we assessed the awareness of 254, 3rd year and 4th year medical students of King Edward Medical University and Rashid Latif Medical college about novel COVID-19 disease during this current pandemic.

Simple random technique was used for sampling purpose. The surveillance of this awareness among 254 medical students about COVID-19 was done through a KAP study. An online questionnaire was used to collect the required data. Demographic details, knowledge, attitude towards the disease and practices of the medical students were recorded through this questionnaire.

Results

In this study 254 undergraduate medical students of KEMU and RLMC filled an online structured ques-tionnaire. Almost all of the respondents were from age group 15-24 (98.8%). There were 154 female students (60.6%) and about 100 male students (39.4%). Primary source of information for most of the students was social media (72%) and Television (26%).

Knowledge

Nearly all participants had heard about COVID-19 (98%) and were well aware about the source of infection (99.6%) and route of transmission of the infection (99.6%). Majority of the students had good knowledge about disease symptoms, incubation period, disease fatality and social measures required for protection from corona virus as shown in Table 1.

Attitude

More than half of the respondents (55.5%) were found to be satisfied with existing precautionary measures by the Government to slow the spread of Novel COVID-19. Although one-third (32.7%) also agreed that the Government institutions shall be able to control the pandemic, many (34.6%) believed that the pandemic shall not be controlled leaving the remaining one-third unsure about the consequences as shown in Table 2.

A high proportion of respondents (86.6%) agreed that they were afraid to go to crowded areas. About 63% of the respondents (63%) believed there is stigma asso-ciated with COVID-19 diagnosis. However, despite this belief, a vast majority (98%) still reinforced the significance of informing health authorities about a suspected case.

Table 1: *Response Regarding Knowledge of Under-graduate Medical Students about COVID-19*

S. #	Appropriate Response	No. (%age) of Correct Answers
1.	The cause of COVID-19 infection is a virus.	253(99.6)
2.	Someone who has had COVID -19 can spread infection to others.	244(96.1)
3.	Route of transmission is respiratory droplets and touching/shaking hands.	253(99.6)
4.	You should suspect corona if someone is showing symptoms (like fever, cough, sore throat, shortness of breath) and there is history of travel or contact.	235 (92.5)
5.	It takes 2 -14 days for symptoms of the disease to appear after infection.	223(87.8)
6.	COVID-19 can be caught from a person who has no symptoms.	202(79.5)
7.	Frequent hand washing, social distancing and respiratory etiquettes can keep you safe from COVID-19.	250(98.4)
8.	COVID-19 is not fatal for all infected individuals.	201(79.1)
9.	There is no Vaccine/Treatment for Novel COVID-19.	240(94.5)
10.	Health Education can help prevent Novel COVID-19.	237(93.3)
11.	Early diagnosis can be helpful in improving the disease outcome.	245(96.5)

Practice

Among the participants, 192(75.6%) always and 60 (23.6%) occasionally used Soap/Hand Gel to wash hands for 20 seconds. Similarly, 223(87.8%) always and 30 (11.8%) occasionally ensured that mask fits properly and covers nose and mouth completely. About 96.9%avoid normal daily life activities (e.g: going to Work, School/College/University, Public Parks, Gyms, Parlors, Cinemasetc).

Figure 1: *Response of Undergraduate Medical Students about Hand Washing Practice*

Independent Sample T Test

Gender wise comparison reveals that there is no statistically significant difference between Knowledge (p-value 0.433), Attitude (p-value 0.498) and Practice (p-value 0.383).

Discussion

On the knowledge questionnaire, an overall correct rate of 92% was found in the well educated population of undergraduate medical students from 3rd year and 4th year MBBS classes of Rashid Latif Medical College and King Edward Medical University. Most participants were well aware about the causative agent (99.6%), incubation period (87.8%), disease transmission (99.6%), symptoms (92.5%), disease fatality (79.1%) and had adequate knowledge about the social etiquettes required for protection from corona (98.4%). Comparable findings have also been observed in similar studies from other countries.[9,10] Following an outbreak of MERS-CoV, a study aimed to measure the level of its awareness in faculty and students of a Saudi Arabian University was conducted.[11] The overall knowledge score was significantly higher in participants from the health colleges.

Table 2: *Response regarding attitude of undergraduate medical students towards COVID-19*

	Response regarding Attitude	Agree	Disagree	Uncertain
1.	Are you satisfied with existing precautionary measures by the Government to slow/contain the spread of Novel COVID-19?	141(55.5%)	75(29.5%)	37(14.6%)
2.	Are Government institutions able to control the pandemic?	83(32.7%)	88(34.6%)	83(32.7%)
3.	Are you afraid to go to crowded areas?	220(86.6%)	12(4.7%)	21(8.3%)
4.	Do you think is there any stigma associated with COVID-19 diagnosis in patients?	160(63.0%)	33(13.0%)	60(23.6%)
5.	It's important to report a suspected case to health authorities?	249 (98.0 %)	1(0.4%)	4(1.6%)

Although most of the students had sufficient knowledge about the emerging Corona infection, it was observed that a small but significant number of medical students (8%) seemed to agree that COVID-19 cannot be caught from a person who has no symptoms. An additional 12% were not sure about this asymptomatic transmission of the virus. According to World Health Organization, the incubation period for COVID-19, which is the time between exposure to the virus and symptom onset, can last up to 14 days. During this pre-symptomatic period, some infected persons can be contagious.[12] Since these are 3rd year and 4th year medical students, it is expected they should be well aware of the virus replicative cycle as well as its implications on disease transmission and prevention.

Attitudes towards COVID-19 were not very optimistic as far as the measures taken by Government were concerned. Approximately 55.5% were satisfied with existing precautionary measures by the Government. Only one-third (32.7%) agreed that Government institutions shall be able to control the pandemic. However, this attitude could be a consequence of an excessive use of social media platforms which is not just the primary source of information in 72% of our respondents, but is also known to spread anxiety among people about the pandemic.[13]

Overall, a high proportion of respondents were concerned about the infection and agreed that they were afraid to go to crowded areas (86.6%). About 63% of the respondents (63%) believed there is stigma associated with COVID-19 diagnosis. A vast majority (98%) reinforced the significance of informing health authorities about a suspected case.

Despite the mixed response regarding attitude towards control of COVID-19 between the participants, majority took precautions to prevent infections: performing proper hand hygiene (76%), wearing masks in an appropriate manner (88%) and avoiding normal daily life activities by not going to any public place (96.9%). Most participants knew that hand washing is an effective way to reduce the spread of virus (98%), and there was no noticeable confusion among participants regarding transmission of disease as shown in above data. However, there was a gap between perceived usefulness and practice of hand hygiene measures. A significant proportion of respondents (24%) admitted that they only occasionally wash their hands with soap or gel for 20 seconds.[14,15]

According to a study in MERS-CoV endemic regions, it was revealed that personnel clearly understand the importance of hand hygiene practices but failed to implement proper hand hygiene applications.[16] In order to successfully prevent infection transmission in health care settings, we need to take persistent appropriate measures as revealed in a Case-Cohort MERS study from South Korea.[17] Educating these young minds can be one of the first key steps towards this goal.

Conclusion

This study concludes that majority of the medical students are well informed about coronavirus disease, its causative agent, incubation period, symptoms, transmission and disease fatality. Most of them have positive attitude and sufficient practices. But practices of hand hygiene, mask usage and social distancing should be emphasized.

Medical students play a vital role in society as they can educate public about the pandemic and its precautions to prevent further spread of the disease. Although the results are positive, continued efforts are required to strengthen knowledge, attitude and practices towards COVID-19, so that Pakistan can win the battle against this pandemic.

Author's Contribution

HB: Study design, data collection, analysis & interpretation, manuscript writing & approval.
BA: Data Collection
TK: Manuscript writing
SA: Supervision whole project
FS: Manuscript writing
SuM: manuscript corrections

Conflict of Interest: None

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Skin Manifestations Associated with Personal Protective Equipment (PPE) in Health Care Professionals during COVID 19 Pandemic

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Abstract

Objective: To determine the frequency and characteristics of skin manifestations among healthcare workers using PPE during COVID-19 pandemic.

Methods: This cross sectional study was carried out at department of Dermatology unit1, Jinnah hospital, Lahore. A total of 102 health care professionals including doctors and nurses working in Jinnah hospital Lahore and using PPE including masks, gloves, and full body protective suits for more than 4 hours per day were enrolled in the study. After informed consent data regarding age, sex, duration of wearing PPE, and history of previous skin disease was noted. Patients were asked about any skin problem related to use of PPE and those with a positive response were examined by a dermatologist and skin lesions noted. All information was recorded on a predesigned proforma.

Results: The mean age of the participants was 28.5+ 3.2 years. There were 33 (32.4%) males and 69 (67.6%) females. Among these 88 (86.2%) were doctors and 14 (13.8%) were nurses. Adverse skin reactions associated with use of PPE were reported in 99 (97%) participants. Those using masks and full body protective suits reported skin manifestations in 97% and 90 % respectively while only 34.3% of those wearing gloves had any skin problem. Common skin manifestations due to use of masks were acne (56.8%), ear soreness and fissuring (54.9%), pressure bruises (32.3%), frictional dermatitis (26.4%) and contact dermatitis(22.5%). Contact dermatitis to gloves was reported in 33.3%. Problems associated with full body protective suit were excessive sweating (82.3%), folliculitis (6.8%) miliaria (3.9%) and intertrigo (1.96 %).

Conclusion: The use of PPE is associated with high rates of adverse skin reactions. There is a need to devise guidelines to prevent or minimize these skin problems and to encourage awareness among health care workers of the role of dermatologists in their care.

Keywords: personal protective equipment, adverse skin reactions, health care workers, COVID-19

Introduction

The novel corona virus as it is commonly called appeared for the first time in December 2019 in Wuhan, China, and took the world by storm.[1] It is a highly contagious disease and routes of transmission include respiratory, contact and aerosol routes. During the current pandemic healthcare workers (HCWs) have been the frontline warriors, caring for patients with COVID-19. As a result many of them contracted the illness and sadly a large number of HCWs across the world including Pakistan, lost their lives in this battle. Personal protective equipment (PPE) including masks, gloves, goggles, eye shields, gowns and full body protective suits is a crucial part of the armamentarium in this battle against an enemy that attacks from all sides.[2]

Keeping in mind the highly infectious nature of the disease and the uncertainty of the infection status of patients, all HCWs must wear PPE not only those looking after confirmed corona patients but also suspected, symptomatic as well as asymptomatic cases during the pandemic. PPE, such as N95 masks, latex gloves, and protective clothing, need often be worn for hours at a time. Unfortunately, the PPE needed to help protect us from this virus can also

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cause unwanted skin conditions. Existing research on prevalence and characteristics of these adverse skin reactions and their associated risk factors due to the use of PPE by HCWs is limited. A study done in Hubei Province during the COVID-19 outbreak by Lan J et al, collected the results of a survey of adverse skin reactions caused by the use of PPE by HCWs. Their results showed a 97% prevalence in HCW reporting adverse skin reactions in 526 out of 542 individuals.[3] Another study by Kaihui Hu et al showed that among the 61 HCWs who regularly used PPE 58 (95.1%) reported skin problems.[4]

The present study was planned to identify the frequency and characteristics of skin manifestations associated with use of PPE in our set up as no local data was available. As health care workers, it is our primary responsibility to protect not only our patients but also ourselves, and the community in general. Wearing PPE for prolonged periods can adversely affect the skin of HCW. To maintain compliance and help diminish long-term skin problems it is of prime importance not only to recognize these occupationally induced cutaneous manifestations but to devise guidelines for their prevention.[5]

Methods

This cross sectional survey was done at dermatology unit 1, Jinnah hospital, Lahore after approval from the ethical review board. Patient information and identification were kept confidential. The target population chosen for this study was healthcare staff working in Jinnah hospital included doctors and nurses. A total of 102 HCWs using PPE including masks, gloves, and full body protective suits for more than 4 hours per day were enrolled in the study. After informed consent basic information regarding gender, age, occupation, and clinical history of previous skin disease was obtained. Patients were asked about any skin problem related to use of PPE. Those with a positive response were examined by a dermatologist and skin lesions noted. All information was recorded on a predesigned proforma. Statistical analysis was performed using SPSS 20. Comparisons of differences between the groups were done using chi square and 2 sample t tests. A p value of less than 0.05 was considered significant.

Results

This study included 102 HCWs of Jinnah hospital Lahore. The mean age of the participants was 28.5+ 3.2 years. There were 33 (32.4%) males and 69 (67.6%) females. Among these 88 (86.2%) were doctors and 14 (13.8%) were nurses. (Table 1) Adverse skin reactions associated with use of PPE were reported in 99 (97%) participants. Those using masks and full body protective suits reported skin reactions in 97% and 90 % respectively while only 34.3% of those wearing gloves had any skin problem.(Table 2). Majority of the HCWs were using the PPE for 6 hours or less (78%.) while only 22% reported its use for more than 6 hours.

Common skin manifestation due to use of masks were acne (56.8%), ear soreness and fissuring (54.9%), pressure bruises (32.3%), frictional dermatitis (26.4 %), contact dermatitis(22.5%) and tinea facei (1.96 %) Contact dermatitis to gloves was reported in 33.3% and fungal infection (0.98%) Skin Problems associated with full body protective suit were excessive sweating (82.3%), folliculitis (6.8%) miliaria (3.9%) and intertrigo (1.96 %).(Table 3) When data was stratified according to age, gender and duration of use of PPE there was no statistical significance across the various subgroups (p value >0.05).

Disussion

COVID-19 has presented all of us with many challenges. Wearing of PPE is mandatory for HCW not only to ensure safety of their patients but also to protect themselves and their families. The use of PPE causes a spectrum of common dermatoses. The most common

Table 1: *Characteristics of Study Sample*

Characteristics	Patients n=102
Age (years)	
• Age range	22-34 yrs
• Mean Age	28.5± 3.2 yrs
Gender	
• Male	33
• Female	69
Occupation	
• Doctors	88
• Nurses	14
Duration of wearing PPE	
• 6 hours or <	79
• > than 6 hours	23

ones reported in our study were excessive sweating, acneiform eruption, ear soreness & fissuring, fric-

Table 2: *Frequency of Adverse Skin Reactions with different Types of PPE*

Type of PPE		
Mask	**Gloves**	Full body suit
99(97%)	35(34.3%)	92(90.1%)

Table 3: *Patterns of Adverse Skin Reactions Associated with use of Masks Gloves and Full Body PPE Suits*

Masks	n (%)	Gloves	n (%)	Full body PPE suits	n (%)
Acne	58(56.8)	Contact dermatits	34(33.3)	Excessive sweating	84(82.3)
Ear soreness / fissuring	56(54.9)	Fungal infection	1 (0.98)	Folliculitis /frunclosis	7 (6.8)
Pressure bruises	33(32.3)			Miliaria	4(3.9)
Frictional dermatits	27(26.4)			Intertrigo	2 (1.9)
Contact dermatits	23(22.5)				
Tinea facei	2 (1.9)				

tional dermatitis on face and irritant/contact dermatitis. Less common adverse skin reactions found were, folliculitis, miliaria and intertrigo. (Table 2)

In this cross-sectional study, a total of 102 HCWs participated. Adverse cutaneous reactions was seen in 99 (97%) cases. This was exactly similar to a study by Lan J et al, who showed a 97% prevalence of skin reactions in HCW using PPE. 3 Age of the participants ranged from 22 to 34 years with a mean age of 28.5+3.2 years. Females (67.6%) outnumbered males (32.4%) with a ratio of 2:1. The results of our study are comparable with that of a study in China in which 91.8%participants were females and 8.2% males with a high prevalence in 30-39years age group.[2] We saw cutaneous adverse reactions more in doctors (86%) than in nurses and paramedics (13.7%). However, Hu et al found adverse skin reactions more in paramedics (51.6%) than doctors (49.1%).[2] Another study in Singapore reported prevalence of adverse skin reactions to PPE during SARS outbreak more in nurses (73%) and other ancillary staff (12.7%) than doctors (14.3%).[3] This difference may be due to higher level of protective measures taken by our doctors than paramedic staff. Another possible reason for difference in percentage may be due to randomized study sample collection and enrollment of overall less number of paramedical staff.

The most common adverse reaction reported to face mask application was acne (56.8%) in our study compared to 59.6% in Foo et al who also reported acne as the most common cutaneous reaction to face mask.[3] The occlusion of pilosebaceous ducts due to local pressure on the skin from the close-fitting mask could be the possible reason of acne or flare up of acne.

Figure-1: *Pressure Bruise due to Mask*
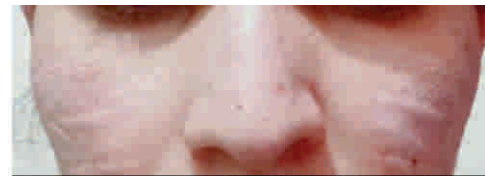
Figure -2 : *Mask Induced Acne*

Figure-3: *Ear Fissuring*

Ear soreness and fissuring was reported 54.9% in our study compared to 11.5% in study conducted by Hu et al.[2] The common practice of usage of KN 95 and surgical face masks with ear loops rather than WHO recommended standard N95 face masks due to limited resources in our health care system could be the possible reason of this difference. Frictional dermatitis was reported in 26.4% in our study compared to 26.2% in a study conducted by Hu et al and 25.5% in a review article by Shehla et al.2,4 As HCWs tie the mask tightly and squeeze the metal clip hard to ensure sealing of mask to prevent entry of

infection this may be the possible reason of friction induced dermatitis. Other reported adverse cutaneous signs in our study include irritant contact dermatitis on face in 22.5% cases. This is consistent with 24.6% in Hu et al .2 It may be attributed to irritant contact dermatitis from the material of mask as edge of the mask is in close contact of skin. Among the adverse skin reactions to gloves, the most common was contact dermatitis 33.3% in our study compared to 37.5% in Foo et al.3 Prolonged exposure of hands to air impermeable environment of gloves, type-1 Immunoglobulin E mediated hypersensitivity reaction to latex,5,6 latex allergy 7 and repeated contact with irritants such as alcoholic disinfectants8 may be the possible causes of this adverse skin reaction. The most common adverse skin reaction reported by use of protective clothing was excessive sweating 82.3% in our study followed by folliculitis 6.8%, miliaria 3.9%, and intertrigo 1.9%. Literature supports data of our study. Jiang reported heavy sweat in 91% HCWs wearing protective gown for longer duty hours.9 Heavy and airtight PPE of non-woven fabric with added factor of hot climate of Pakistan may be the possible reasons of excessive sweating. Moreover, hot and humid environment is conducive to blockage of sweat ducts and growth of candida causing miliaria and intertrigo respectively. Our study provides evidence of a high frequency of adverse skin reactions, with prolonged use of protective suits, face masks and gloves in particular. To the best of our knowledge, this has not been described in the local dermatological literature and existing international data on adverse cutaneous skin reactions due to use of PPE is also limited. It is important to note, however, that in other similar studies the reported skin reactions could not be verified and documented by investigators, but were purely based on the subjective assessment of the healthcare staff themselves. However in our study all patients were examined by dermatologist to document the features accurately.

Our HCWs, fighting on frontline against COVID 19 must not ignore care of their skin. Few practical guidelines for prevention of these adverse skin reactions include:

1. To prevent acneiform eruptions, washing with noncomedogenic cleansers, using water based moisturizers and taking breaks from the mask for 15 minutes every 2-3 hours are recommended.

2. For contact or irritant dermatitis due to masks, using alcohol-free barrier film wipes or thin foam dressings behind the ears and wearing N95 mask straps on the crown of the head to minimize contact with ears may be helpful.

3. Low potency topical glucocorticoid and tacrolimus can be applied in case of eczema. In case of bacterial and fungal infection, an antifungal and antibiotic drug is advisable respectively.

4. To prevent and treat pressure-related facial skin injury, a thin hydrocolloid or foam dressing can be worn under surgical masks and an alcohol-free barrier wipe can be applied to areas of direct contact prior to wearing N95 masks.

5. Dryness caused by the long-term use of PPE can be relieved by adequate water intake and frequent application of bland emollient, urea or ceramide containing moisturizer that should be applied at least 30 minutes before wearing face mask. Medical staff is advised to avoid smoking if they have applied white soft paraffin as it is flammable.[9]

6. Regarding hand care, HCWs should use high quality non-powdered latex gloves after application of moisturizer on hands. Cotton gloves should be used inside latex gloves in case of latex allergy. The practice of wearing gloves for longer time period should be avoided. Mild soaps should be used for hand washing.

7. Excessive sweating should be avoided by HCWs as it damages the skin barrier function. It can be controlled by adequate air conditioning at the work place, use of better material in PPE, avoiding prolonged working hours with frequent rotations and taking a proper shower after leaving contaminated area. In case of persistence or gradual worsening of skin problems, HCWs are advised to consult a Dermatologist.[10]

PPE is going to stay as part of our daily routines in the hospital setting for the predictable future. Clinicians need to be aware of the potential problems that may result from prolonged use of these necessary protective measures. This study will help dermatologists to propose solutions for cutaneous side effects of PPE in future.

Conclusion

Extended use of personal protective equipment (PPE) has increased the frequency and severity of common dermatologic conditions in healthcare workers. Proper management of occupationally induced skin conditions during the COVID-19 pandemic is critical to minimize long-term consequences and promote compliance to safety measures.

Authors Contribution

LM, SI, WH, RM, AND SR: Concept, data collection , analysis, write up.
TR: Concept, analysis, write up.

Conflict of Interest: None

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Battling the Infodemic- A Cross Sectional Study of General Population of Pakistan

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Abstract

Objective: This study aimed to explore the sources of COVID-19 related information used by the general public in Pakistan it focused on the strategies being employed to fact-check information before its propagation and to identify common misperceptions and attitudes toward these myths.

Methods: A cross-sectional online survey of 365 Pakistani residents was conducted between 1st July and 31st July 2020. Based on literature review a Google Forms was distributed randomly via social media, it consisted of demographic information and collected data on the common sources of information, misinformation and response of people to prevalent myths and misconceptions surrounding COVID-19.

Results: Out of 365 participants, 60.2% of the respondents were female with the mean (SD) age of 32.2± 11.35 years. Television and social media websites were the major sources of information and WhatsApp was found as the main social media site to encounter misinformation by 118(32.2%) participants, only a small number 114(31.2%), checked the veracity of information and another few 18(4.9%) directly challenged any account. Official government sources were trusted by most Pakistanis. Sixty-three percent of participants agreed that only possible solution to COVID-19 pandemic is vaccine while misconception about dead bodies of COVID-19 patients being used by hospitals to get international funding was shared by 262(71.7%).

Conclusion: A concerted effort is needed to mitigate the detrimental effects of infodemic through education and participation of the stakeholders. Furthermore, the need to publicize strictly authentic information and device policies for the mainstream media regarding COVID-19 related content by the government is critical.

Keywords: COVID-19; Infodemic; Perceptions; Myths

Introduction:

The novel coronavirus (COVID-19) has killed thousands, and infected millions of people round the globe. It originated in Wuhan, in December of 2019, and since then has been declared a pandemic. At the time of writing, COVID-19 has infected 13,538,312 people worldwide, and caused 445,422 confirmed deaths.[1] In Pakistan, first case of COVID-19 was reported in February of 2020, and the death toll has now crossed 200,000 mark with more than 4000 confirmed deaths.[2]

Huge demand for information regarding coronavirus, and a sea of unanswered questions created a perfect

breeding ground for all sorts of disinformation, misinformation, fake news, myths and conspiracy theories, forcing WHO to declare the situation as "infodemic". Some of them were fairly innocuous like Russian President Vladimir Putin released 500 lions to keep people indoors, or eating sea lettuce and herbs could prevent COVID-19. Others were quite menacing, and often, life threatening – drinking methanol to cure COVID-19 led to the death of more than 700 people in Iran, and misinformed arsonists destroyed several 5G transmission towers in Britain, convinced that these 5G towers were spreading the disease in their areas. A conspiracy theory based short movie called "Plandemic" – which alleged that powerful elite have started the outbreak to make profits – had garnered millions of views on Facebook and YouTube before it was removed from these forums.[3]

Pakistan has its own share of myths and misinformation regarding COVID-19. People got diarrhea after taking excessive doses of Sana Maki herb. There was widespread misconception in people that the

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government was taking thousands of dollars per dead body of COVID-19 patients, and thus falsifying deaths of other patients to inflate the numbers. According to a poll by Gallup International in March, 2020,[4] about 25% of Pakistanis believed that a foreign power was deliberately spreading corona-virus in Pakistan. Internet, in general, and social media in particular, has enabled the rapid dissemi-nation of false information regarding coronavirus, and there is a need to investigate this phenomenon.

Since the inception of COVID-19, numerous studies have been conducted to ascertain the frequency and impact of misinformation and disinformation on social media regarding coronavirus. Social media platforms like Facebook, Twitter, YouTube, Reddit and Instagram are a prime source of information for a majority of global populace. A study of Pew Research Center, USA, determined that about half of the adult US population got news regarding COVID-19 from the Facebook.[5] Roughly three-quarters (74%) of these posts used news organizations' websites as potential sources, whereas just 1% of the posts linked directly to healthcare and science websites, which indicated the prevalence of unverified information circulating on social media platforms. Research by Bruno Kessler Foundation, Italy, determined that in the month of March, on average, 46,000 misleading posts were posted on Twitter every single day.[6] Kouzy et al. conducted a research on Twitter using 14 different hashtags related to COVID-19, and on a dataset of 673 tweets they found out that 24.8% of tweets included misinformation and 17.4% contained unverifiable information.[7]

A recent survey suggested that nearly 40% of adults in UK are finding it hard to separate truth from false information about coronavirus.[8] Similarly, Amgain et al. also listed some very common myths surroun-ding the novel coronavirus, and debunked them with the relevant facts.[9] A study conducted in Canada, in which 1500 Canadian adults were inquired about the source of their COVID-19 news, and how much misinformation they encountered, and what they did about it,[10] reported that most Canadians preferred to get information regarding COVID-19 from news rather than social media, and 68% reported finding some sort of misinformation on at least one of the common social media platforms. It can be seen that globally, studies are being conducted to assess the extent of misinformation prevalent in public regarding COVID-19, and efforts are being made to curb the spread of this Infodemic by flattening its curve[11]. No such study has been conducted in Pakistan as of yet.

Methods

The study was conducted through an online survey, made on Google Forms. The ethical approval for the research was taken from the Institutional Review Board, King Edward Medical University, Lahore. No sensitive information was collected from the survey participants, and the survey was filled by participants anonymously. The target population were the resi-dents of Pakistan with access to smartphones and Internet. Around 500 people filled the survey between 1st of July, 2020 to 31st of July, 2020. Our survey research followed the cross sectional research design to analyze the behaviours and opinions of the target population by studying a sample of that population, collected through convenience sampling. Most questions in the survey were of multiple choice or dropdown type to avoid ambiguous answers. Demo-graphic information like age, gender, marital status, educational background and employment status were collected for analyzing responses based on demogra-phics. Questions aiming to identify common sources of misinformation and unverified news and attitudes of people towards common myths and perception regarding covid-19 were included. The responses collected through the survey were analyzed using the tools available in the Google Forms, which automa-tically builds the descriptive statistics for each multiple choice type question.

Results

365 participants completed the questionnaire. The mean age was 32.2± 11.35%. Majority were female (220, 60.2%). Only 10.7 % of the population belon-ged to rural settings. Most of the population were students (102, 27.9%) closely followed by Health Care Providers (99, 27.1%). Table 1 gives further demographic details of the sample.

A significant proportion of the participants (64.4%) used Television as media source to get news and updates, with a close second majority (61.9%) used social media websites (Facebook, twitter, Instagram, Whatsapp). Other sources mentioned were WHO Official website, CDC official website, medical

journals and through word of mouth by doctors in the family. Only 30.7% stated that they fact checked information before sharing it through social media, 11.2 % never fact checked any news or story they shared with others.

26.3% participants expressed trusting the mainstream media a lot for accuracy of news related to Covid while 50(13.6%) participants trusted the Public service departments and Govt. ministries a great deal for accuracy of COVID-19 news. Although political parties and leaders were not trusted by 104(28.4%) respondents as trusted source of information, this mistrust was less noted for mainstream media (26,

Table 1: *Participants Characteristics (n=365)*

DEMOGRAPHICS	Total N (%)
Gender	
Male	145(39.7)
Female	220(60.3)
Marital Status	
Single	181(49.6)
Married	171(46.8)
Separated/Divorced	8(2.2)
Area	
Urban	326(89.3)
Rural	39(10.7)
EducationUpto Grade 5	
Upto class 5	13(3.6)
Upto matric	20(5.5)
Graduation	104(28.5)
Professional degree	227(62.2)
Occupation	
Student	102(27.9)
House wife	43(11.8)
Unemployed	9(2.5)
Unskilled worker	17(4.7)
Skilled workers	95(26)
Healthcare workers	99(27.1)

7.1%). As a source of misinformation related to COVID-19 Pandemic, WhatsApp was identified as the leading social media site among four others (Twitter, Youtube, Instagram, Facebook) by 118(32.3 %) participants, In such scenarios only 114(31.2%) consulted other sources to verify the information , 18(4.9%) directly challenged any account which shared the misinformation. About reporting misinformation sources, 200 (54.7%) respondents admitted to never report an account with fake information to law enforcement. 18(4.9%) participants reported accounts to media outlets and 23(6.3%) reported the account with misinformation to that social media site

where it was created. Table 2 provides more information on the type of media sources, the time spend on news, fact checking and perception of general population about role of media stories in spread of fake news.

Table 3 shows the participants responses 31 statements related to perception/myths circulating in News and social media about Covid-19 pandemic.

233 (63%) people stated that a vaccine is the only possible solution to this pandemic, 262 (71.1%) agreed to the statement "hospital are using dead bodies of Covid patients to get funding",185(50%) said that religious practices like 5 times wazzu is preventive in catching infection, majority of the participants, 289(71%), disagreed with the statement 'Poison injection (zehr ka teeka) is being given to corona patients taken to hospitals leading to their deaths'. Results show that 169(46%) participants

Table 2: *Attitude of General Public Towards Social Media News*

Question	Total n (%)
Which media sources have you used to get news and information about Covid 19 since the outbreak	
a) Television	235
b) Social media (facebook,Whatsapp,Snapchat,Instagram etc)	229
c) Newspaper(print media)	59
d) Online(news websites/mobile apps)	226
e) Radio	14
f) Others n% need to appear in front of others	17
How much time do you spend on COVID-19 related news on social media?	
a) Less than one hour	225(69.6)
b) 1-2 hours	52(14.2)
c) More than 2 hours	21(5.8)
d) Other	67(18.3)
Do you think publishing more news related to Covid-19 on different forums/Media has spread misinformation among the people	
a) Yes	236(64.7)
b) No	46(12.6)
c) Maybe	83(22.7)
Do you fact check information related to Covid-19 before liking/sharing/publishing it?	
a) Never	41(11.2)
b) Occasionally	43(11.8)
c) Sometimes	63(17.3)
d) Most of the times	106(29)
e) Always	112(30.7)

rejected the claims of preventing infections by taking certain foods like garlic and SANA MAAKI. 145(39.7%) participants stated a neutral opinion when asked if the virus was deliberately created or not. 34% of this cohort believed that hot weather kills this virus. A striking 71% agreed with the statement " hospitals are using dead-bodies of covid patients to get funding' .Half of the participants expressed that they think religious practices like regular Wazzu five times a day can ward off the virus.

Discussion

Health officials around the world and here in Pakistan are grappling with both a pandemic caused by a new coronavirus, COVID-19, and a deluge of misinformation about the virus in the media and on social media.[12] The authors of this paper felt an urgent need to address this issue in this part of the world. The current study is believed to be one of its kind in Pakistan as it not only focuses on the perception of general population about the myths related to Covid-19 doing the rounds on social media, it also aims to

Table 3: *: Opinion about Perception/Myths Circulating about the Covid-19 Pandemic (Use Table No Space Option to make it more Concise wit not many Spaces in Between).*

Sr#	STATEMENTS	Agree N(%)	Disagree N(%)	Neutral N(%)
1	The COVID-19 pandemic prediction was correctly made in books and TV shows earlier.	127(34.7)	116(31.7)	122(33.4)
2	The coronavirus was deliberately created or released by scientists in a laboratory"	68(18.6)	152(41.6)	145(39.7)
3	It is fair to call COVID-19 as CHINA virus.	74(20.2)	209(57.2)	82(22.5)
4	COVID-19 is being used as a weapon of Bio-terrorism by various countries.	87(23.8)	135(36.9)	143(39.2)
5	Anti-Muslim groups have developed a deadlier strain of coronavirus against Muslim countries.	32(8.7)	253(69.3)	80(21.9)
6	The use of bat soup in Wuhan was the origin of Covid-19,	99(27.1)	84(23)	182(49.9)
7	The virus was originated as a result of 5G upgrades to cellular networks.	19(5.2)	226(61.9)	120(32.9)
	The virus does not exist, it is in fact a hoax/drama	6(1.6)	207(56.7)	24(10.1)
8	Virus is more pronounced in certain ethnic groups i.e. Chinese, Black population.	65(17.8)	187(51.2)	113(31)
9	Ordering or buying products shipped from overseas can infect you with COVID.	98(26.8)	176(48.2)	91(24.9)
10	The coronavirus affects only the elderly >60 yrs.	26(7.1)	322(88.2)	17(4.7)
11	You cannot recover completely from the coronavirus disease.	32(8.7)	274(75)	59(16.2)
12	Aspirin can aggravate COVID-19 symptoms.	48(13.1)	99(27)	218(59.7)
13	Taking a hot bath prevents the new coronavirus disease.	48(13.1)	198(54.2)	119(32.6)
14	Being able to hold your breath for 10 seconds or more without coughing means you're free from COVID-19.	39(10.6)	221(60.5)	105(28.8)
15	Antibiotics are effective in preventing and treating the new coronavirus.	69(18.9)	175(47.9)	121(33.2)
16	Cold weather kills COVID-19.	6(1.6)	301(82.4)	57(15.6)
17	Hot weather kills COVID-19.	34(9.3)	268(73.4)	63(17.3)
18	Herd immunity is the only solution.	112(30.6)	116(31.7)	137(37.5)
19	A vaccine will be the cure to COVID-19.	233(63.8)	29(7.9)	103(28.2)
20	Certain foods can be used for prevention.e.g SANA MAKKI, GARLIC.	82(22.4)	169(46.3)	114(31.2)
21	Avoiding poultry meat and eggs will prevent covid-19 infection.	12(3.3%)	276(75.6)	77(21.1)
22	Hand-sanitizers are more effective than washing hands with soap and water.	50(13.6)	275(75.3)	40(11)
23	Wearing of face masks is promoted to boost up sales of Chinese manufactured products.	24(6.5)	292(80)	49(13.4)
24	Doctors are using experimental drug on patients admitted in hospitals.	99(27.1)	172(47.1)	94(25.8)
25	Poison injection (zehr ka teeka) is being given to corona patients taken to hospitals leading to their deaths.	22(6)	289(79.1)	54(14.8)
26	Hospitals are using dead bodies of COVID 19 patients to get funding.	262(71.7)	34(9.31)	76(20.8)
27	The Gov. and media covers up the death toll due to Covid-19	122(33.4)	114(31.2)	129(35.3)
28	Lab test results from govt. institutes are not reliable.	121(33.1)	133(36.4)	111(30.4)
29	Religious practices like 5 regular prayers, wazzu, reciting Aytal-kursi can prevent COVID 19.	185(50.6)	105(28.7)	75(20.5)
30	Vaccine should only be used if declared Halal.	96(26.3)	199(54.5)	70(19.2)

understand the sources of information used by the public and the strategies used to fact-check information before circulating it further. False narratives about COVID-19 have gone global and are spreading almost as faster and further as the virus itself, e.g. a tweet by the French health minister, on 14th March , about avoiding anti-inflammatory drugs (ibuprofen, cortisone) generated 4000 re-tweets in three days, the media buzz was so significant that the European society of Cardiology had to step in to limit the individual stances.[13] The World Health Organization has dubbed this phenomenon as an "infodemic" – "an overabundance of information, some accurate and some not – that makes it hard for people to find trustworthy sources and reliable guidance when they need it." [14]

A report by Statista.com, 2019; e-marketers, 2019[15] revealed that about 3.5 billion people use the social media globally in 2019, which represents about 45% of the entire population of the world and it is projected to hit 66 % of the world's population by the end of 2020.With social distancing measures in place during the state of emergency in various countries, social media is now an indispensable lifeline for people to connect to friends, families, classmates, and co-workers. On the other hand social media has become the primary venue for propagating fake news. The results showed that 64.4% used television and 61.9% of the participants used social media as the main source of news related to Covid-19 , a very few participants (4.7%) mentioned the names of other sources like official WHO and CDC's websites which carry relatively authentic and reliable information. Even though media news stories and headlines are not verified or have clear evidence of truth, media sources of COVID news was still trusted by a big number (27%).Most Pakistani stated that they trusted the official government sources like statistics from public service/Government ministries and departments. This puts a huge responsibility on the government to publicize and support only fact-checked and authentic information and also set standard operating procedures for mainstream media about the content going on air during the pandemic. 33% participants named Whatsapp as the application where they encountered false, inaccurate or misleading information about the pandemic. Most social media companies relay on their users to flag problems in content, in

this cohort of Pakistani population, a meager 5% reported the issue to the website.

Social media shapes the ideas and thoughts of this generation. President of USA tweeted and called the virus as CHINA VIRUS, in our study population a significant proportion (20%) participants sated they had neutral opinion on whether this is a fair statement or not. 24% thought the Corona virus is a weapon of bio terrorism. Very strong speculations were created by social media sites about the use of herbal medicines and certain foods (Garlic, SANA MAKKI etc), even without any evidence present 23% participants agreed to these food items having curing abilities, and this population also included medical doctors which is a point of concern.

Hernandez-Garcı́a et al. studied the available information on the Internet about COVID-19, they found that various aspects of preventive measures advocated by the WHO or CDC were found in only 32.5% of the studied web links on the Internet[16]. They suggested that official sources of regional/ national governments should provide correct information about COVID-19 that conforms to the standard guidelines issued by the WHO/CDC and provide links to the same on other popular websites on the Internet.

This infodemic is negatively affecting people's routine, their behaviour, and overall wellbeing. There is a flooding of information on the frequency of hand washing, how to wash consumable items or packets, disinfecting homes, etc. This compelled people to unnecessarily hoard the chemical disinfectants and cleaning products.

Similarly, information on closure of shops during lockdown resulted in buying and stocking of excess vegetables or groceries. This opened the business of false claims about miracle cures or unproven natural remedies that people have fallen prey of.[17]

Overall, this misinformation has created a wave of anxiety and stress among people. Moreover, people with pre-existing mental conditions like anxiety and obsessive-compulsive disorder are suffering the most. The pandemic is not only taking a heavy toll on the economy but also on the psychological health, behaviours, and livelihood of the people. A study done in India showed that 26% and 33% felt that

information about COVID-19 made them feel uncomfortable and distracts routine decision-making.[18] And to make matters worse, spread of misinformation has led to attacks on healthcare providers. A leading newspaper of Pakistan published a report and main stream media channels also took up the story of a huge mob vandalizing the Civil hospital in Karachi when the dead body of a Covid-19 patient was not given to the family due to the already established standard operating procedures.[19] This incident generated the concept of doctors using research drugs without consent , poisonous injections being injected to healthy individuals and then selling the dead bodies to get international fundings , it deeply interfered with the process of surveillance and treatment.

The COVID-19 infodemic causes confusion, sows division, incites hatred, promotes unproven cures, and provokes social panic, which directly impacts emergency response, treatment, recovery, and financial and mental health during the difficult time of self-isolation.[20] Social media companies are making efforts to police COVID-19 misinformation on their sites, but we should not rely on them alone.[21]

One of the limitations of our study was that the web based survey was mostly filled by participants with a sound educational background, participants who had education less than matric were under represented. Another limitation was that this survey was not targeted at participants from rural background who seldom use social media and more commonly use sources like Television, radio and print media for information. There is a likelihood of possibly more misinformation/ belief in myths in less educated people.

Conclusion

DIGITAL HYGIENE practices need to be ensured , which will allow the public to have the knowledge about what resources they should bookmark for authentic news in future. Emphasis should be made by leaders of communities, government officials, health care providers and media outlets to fact check and validate information before propagating it.

Author's Contribution:

IA: made group form, did data analysis, contributed to discussion and results.
ZP: Contributed in data collection, writing introduction and methods.
FC: Contributed in data collection and writing abstract and correcting references.
NI: Conceived the idea, supervised whole project.

Conflict of Interest: None

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COVID-19: Knowledge, Attitude and Practice of Preventive Measures Among Undergraduate Medical Students of Pakistan

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Abstract

Objective: To evaluate the knowledge and attitude of undergraduate medical students regarding Covid-19 and to assess their practice of precautionary measures.

Methods: This cross-sectional study was conducted from 13th to 18th July'2020. A pretested questionnaire, created on google forms, was distributed to a sample of medical students employed through convenience sampling. Data was analyzed using IBM SPSS version 20. Qualitative variables were described in frequencies and percentages. Chi-square test was applied to find associations between variables. A p-value of less than 0.05 was considered statistically significant.

Results: We received 406 validated responses from medical students studying in Punjab (35%), Khyber Pakhtunkhwa (21%), Sindh (19%), Azad Kashmir (12.6%), Federal Capital (8%) and Balochistan (4.4%). More than two-third of them had attended lectures on Covid-19. The respondents were least knowledgeable about contagiousness after recovery (27%) and the recovery criteria of the disease (41%). About 40% of them would avoid working with a Covid-19 patient. Practice of certain precautionary behaviors were associated with level of concern (p=0.01). Handwashing, use of face masks and social distancing measures were adopted by the majority of the respondents (≥80%). The respondents reported increased worry (75%) and loneliness (50%) during the pandemic. Increased anxiety was more common among female participants (p=0.04).

Conclusion: The practice of preventive measures among medical students was satisfactory. However, we identified some knowledge gaps in their understanding about Covid-19 which should be addressed. Formal or practical lectures on Covid-19 may benefit medical students.

Keywords: Covid-19, Medical students, KAP study, Pakistan

Introduction

The Coronavirus disease 2019 (Covid-19) is a respi-ratory infection caused by SARS CoV-2.[1] It started as a pneumonia outbreak in Wuhan, China in December 2019 and eventually spread to more than 200 countries, causing a pandemic.[2] The first confirmed case of Covid-19 in Pakistan presented on February 26, 2020.[3] To date, there have been 261,916 reported cases of COVID-19, with 5,522 reported deaths.[4] To control infection spread, a national lockdown was instituted, and all educational institutions were closed. Fortuna-tely, this month we saw a downturn in the number of new cases.[5] This development led to discussions about reopening educational institutions. If the government decides to resume all academic activities, strict implementation of standard operating procedures (SOP's) will be necessary to ensure the safety of students and faculty. The implementation of safety guidelines is important especially in medical colleges because their students and faculty are required to spend time in their teaching hospitals during clinical ward rounds, and maybe at a greater

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risk of exposure to infection. To improve the condition of medical colleges, we need studies that assess medical students' knowledge, attitude and practice of preven-tive measures. Currently, there is only one study that assessed the awareness of medical students regarding Covid-19. It was a single institution study and also included students of Allied health sciences.[6] The objective of our study was to identify knowledge gaps in medical students and to evaluate their attitudes and practices regarding Covid-19. The findings of this study will highlight the deficiency areas of medical students and help improve those areas for better adop-tion of preventive measures.

Methods

This cross-sectional study was conducted from July 13, 2020 to July 19, 2020. Medical students studying in different medical colleges of Pakistan were conve-niently sampled. The required sample size was 374 (95% confidence interval and 5% margin of error). The population estimate was obtained from Wikipe-dia and the calculation was done with Raosoft calculator.[7] The inclusion criteria for this study was enrolment in the MBBS program. Responses without given consent were excluded. We used a pretested questionnaire from a Jordanian KAP study.[8] The questionnaire was created on Google forms and its link was shared through WhatsApp Messenger (a freeware messaging platform) to medical students of different colleges. The participants were required to sign in with their Google account to fill out the questionnaire. This prevented participants from making duplicate submissions. A description of the study along with a statement of consent, information confidentiality and voluntary participation study was given at the beginning of the questionnaire. In the first section, the participants' gender, year of education and the name and location of their medical college were recorded. Section 2 and 4 contained statements that assessed their knowledge about Covid-19 transmission, virulence and potential risk factors. Section 3 assessed their perceived knowledge about Covid-19. In section 5, we assessed their perception regarding susceptibility and disease severity. Section 6 assessed their attitude toward testing and preven-tion measures. The response options were Agree, Disagree and Don't know. Section 7 recorded beha-viour changes during the pandemic and section 8 asked about the precautionary measures adopted since the start of the pandemic. Lastly, the partici-pants were asked if they had attended any lecture regarding Covid-19 and if they were interested in attending one. They were also asked about their level of concern during the pandemic. This study was approved by the Institutional Review Board of CMH Lahore Medical College & Institute of Dentistry.

The responses were analysed using IBM SPSS version 20. Descriptive variables were expressed in frequencies and percentages. Chi-square test was performed to find associations between variables and a p-value of less than 0.05 was considered statistically significant.

Results

We surveyed 455 medical students from 17 public and 26 private medical colleges of Pakistan and received 406 valid responses. The majority respon-dents were females (n=256, 63%). Most of them were studying in Punjab (n=143, 35.2%); followed by Khyber Pakhtunkhwa (n=86, 21.2%), Sindh (n=77, 19%), Azad Kashmir (n=51, 12.6%), Federal Capital (n=31, 7.6%) and Balochistan (n=18, 4.4%). Our sample consisted of 20.4% first year students, 18.5% second year students, 11.6% third year students, 23.9% fourth year students and 25.6% final year students. More than two-third of the students had attended lectures on COVID-19. Moreover, 68% of them said they wanted to attend more COVID-19 related lectures.

In section 2, participants identified "hand shaking" (n=390, 96.1%), "large droplet inhalation" (n=361, 88.9%), "kissing" (n=352, 86.7%), "air" (n=266, 65.5%), "skin contact" (n=309, 76.1%) and "contact with contaminated surfaces" (n=381, 93.8%) as potential modes of SARS CoV-2 transmission. Fifty-three percent (n = 216) respondents said that "animals" were an unlikely source of SARS-CoV-2 transmission while 23.6% (n=96) were unsure about it. About 41% (n=167) of the respondents were of the view that "contaminated food" was a potential source of COVID-19 however fewer respondents (n=123, 30%) agreed that COVID-19 has a Feco-oral mode of transmission. One third of the participants were unsure if SARS-CoV-2 can be transmitted from breast milk (n=144, 35%) or vertically (n=140, 34%).

Blood transfusion (n=188, 46.3%) was identified as another likely source of COVID-19.

In section 3, the majority claimed that they had clear knowledge of COVID-19 symptoms (89.9%) and transmission (88.2%). The least understood subject for them was "infectiousness after recovery" (27.3 %), as evident in figure 1.

Sections 4, 5 and 6 are summarized in table 1.

Discussion

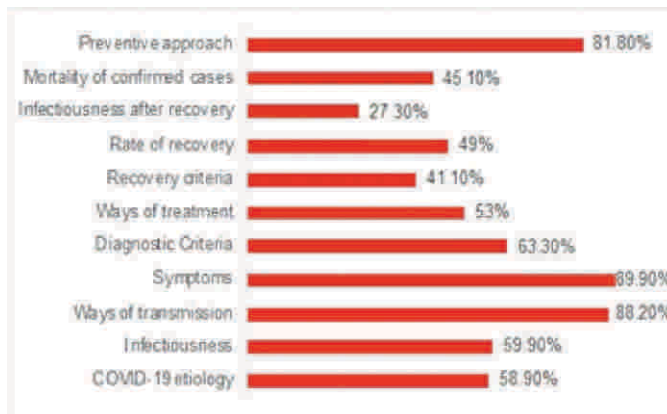With knowledge and

Table 1: *Statements Regarding Potential Risks, Susceptibility and Attitude Towards Testing and Prevention*

Section 4	Statements	Disagree	Don't know	Agree
1.	COVID-19 has severe implications on health and economy of Pakistan.	6 (1.5%)	35 (8.6%)	365 (89.9%)
2.	The spread of COVID-19 in Pakistan is controllable.	121 (29.8%)	107 (26.4%)	178 (43.8%)
3.	I consider myself as knowledgeable about COVID-19.	31 (7.6%)	122 (30%)	253 (62.3%)
4.	People with chronic diseases are at a higher risk for COVID-19.	13 (3.2%)	47 (11.6%)	346 (85.2%)
5.	Unlike common cold viruses and other strains of Corona viruses, COVID-19 could cause pneumonia.	25 (6.2%)	90 (22.2%)	291 (71.7%)
6.	COVID-19 has a high recovery rate.	38 (9.4%)	101 (24.9%)	267 (65.8%)
7.	One sick person can transmit the disease to about four other people.	34 (8.4%)	81 (20.0%)	291 (71.7%)
8.	Health education can help to prevent the disease.	8 (2.0%)	48 (11.8%)	350 (86.2%)
9.	Wearing a regular mask prevents getting the disease.	18 (4.4%)	56 (13.8%)	332 (81.8%)
10.	This virus is a human made or a biological weapon.	148 (36.5%)	163 (40.1%)	95 (23.4%)
11.	The media coverage of COVID-19 in Pakistan is sufficient.	167 (41.1%)	116 (28.6%)	123 (30.3%)
12.	I spread information about this virus without checking the facts.	306 (75.4%)	61 (15.0%)	39 (9.6%)
13.	I double check information about the virus that I read/heard.	54 (13.3%)	92 (22.7%)	260 (64.0%)
14.	I have stocked up on supplies in case of another lockdown.	255 (62.8%)	79 (19.5%)	72 (17.7%)
15.	I would avoid working with a patient who is a suspect of COVID-19.	160 (39.4%)	85 (20.9%)	161 (39.7%)
16.	Only sick people should be wearing a mask to prevent the spread of the virus.	306 (75.4%)	53 (13.1%)	47 (11.6%)
17.	The number of COVID-19 cases will increase beyond the capacity of local hospitals.	39 (9.6%)	119 (29.3%)	248 (61.1%)
Section 5	**Statements**	**Disagree**	**Don't know**	**Agree**
1.	I am anxious of getting COVID-19.	112 (27.6%)	126 (31.0%)	168 (41.4%)
2.	I am anxious that one of my family members will get COVID-19.	79 (19.5%)	72 (17.7%)	255 (62.8%)
3.	I'm susceptible to acquiring COVID-19.	139 (34.2%)	128 (31.5%)	139 (34.2%)
4.	My family is susceptible to acquiring COVID-19.	103 (25.4%)	110 (27.1%)	193 (47.5%)
5.	It is possible to acquire COVID-19 in my local community.	47 (11.6%)	79 (19.5%)	280 (69%)
6.	I might get COVID-19 in the next 6 months.	89 (21.9%)	164 (40.4%)	153 (37.7%)
Section 6	**Statements**	**Disagree**	**Don't know**	**Agree**
1.	I would consider being tested for COVID-19 if I show signs and symptoms of the disease.	23 (5.7%)	46 (11.3%)	337 (83%)
2.	I would consider having vaccination against COVID-19 if it is available.	18 (4.4%)	33 (8.1%)	355 (87.4%)
3.	If a person gets COVID-19, they should be avoided because of it.	55 (13.5%)	60 (14.8%)	291 (71.7%)
4.	If a person gets COVID-19, their family should be avoided because of it.	61 (15.0%)	65 (16.0%)	280 (69.0%)
5.	If somebody in my family were to get COVID-19, I would want it to remain a secret.	229 (56.4%)	71 (17.5%)	106 (26.1%)
6.	If I got infected, I will be extremely stressed out by how the health-workers, people in hospital, hospitalization process will deal with me.	121 (29.8%)	108 (26.6%)	177 (43.6%)
7.	If I got infected, I will do anything to avoid isolation.	336 (82.8%)	24 (5.9%)	46 (11.3%)

Table 2: *Statements Regarding Preventive Behaviors*

	Statement	Never	Rarely/ Sometimes	Often/All the time	p-value
1.	Buying masks.	21 (5.2%)	78 (19.2%)	307 (75.6%)	NS
3.	Wearing a face mask.	9 (2.2%)	59 (14.5%)	338 (83.3%)	NS
4.	Wash hands regularly.	7 (1.7%)	36 (8.9%)	363 (89.4%)	NS
5.	Use disinfectant.	19 (4.7%)	58 (14.3%)	329 (81.0%)	0.004
9.	Disinfecting my phone (screen).	60 (14.8%)	89 (21.9%)	257 (63.3%)	0.02
10.	Avoid public gatherings.	20 (4.9%)	41 (10.1%)	345 (85.0%)	0.01
11.	Stay at home as much as possible	9 (2.2%)	41 (10.1%)	356 (87.7%)	0.01
12.	Avoid eating outside.	19 (4.7%)	53 (13.1%)	334 (82.3%)	NS
13.	Avoid shaking hands when greeting others.	16 (3.9%)	62 (15.3%)	328 (80.8%)	0.005
14.	Avoid hugging others when greeting them.	17 (4.2%)	62 (15.3%)	327 (80.5%)	0.009
15.	Avoid using public transportation.	16 (3.9%)	41 (10.1%)	349 (86.0%)	0.002
16.	Get sufficient sleep.	27 (6.7%)	76 (18.7%)	303 (74.6%)	NS
19.	Persuade people to follow the precautionary guidance.	9 (2.2%)	49 (12.1%)	348 (85.7%)	NS
20.	Follow social distancing procedures.	16 (3.9%)	45 (11.1%)	345 (85.0%)	0.002

Notes: Association with Gender significant at p

awareness comes the understan-ding of better safety practices. That is the rationale for Covid-19 related KAP studies from different count-ries.[6,8] Our study assessed medical students studying in public and private medical colleges in a compre-hensive manner. We highlighted the knowledge gaps present in medical students regarding Covid-19 related topics and assessed their attitude and practice of preventive measures during the pandemic. Regarding potential sources and modes of SARS CoV-2 transmission, many of respondents knew about disease transmission through contact. How-ever, there was a significant difference in the number of people who agreed with droplet transmission (88.9%) versus airborne transmission (65.5%). Some of the respondents (23.6%) were unsure about animals being a source of the virus. One third agreed that Covid-19 had a feco-oral mode of transmission while 41% agreed that Covid-19 can be contracted from contaminated food. They were also unsure about the vertical transmission of the virus. These results were comparable to the findings of Khasaneh et el.[8] The majority of the respondents had self-reported knowledge of Covid-19 symptoms, ways of transmission and preventive approaches. Very few respondents had clear understanding of infectious-ness after recovery (27%). Many respondents (89%) agreed that Covid-19 had caused economic disrup-tion in Pakistan. Only 43% agreed that Covid-19 is controllable. This could mean low confidence in the healthcare system. This was reflected more in section four statement,[17] where more than two third of the respondents agreed that Covid-19 cases will increase beyond the capacity of the hospitals. In section six, 43% of the participants showed extreme concern about how the healthcare workers would deal with them if they had Covid-19. Regarding the origin of the virus, some (23%) believed that the virus was human-made, and some were unsure about its origin (40%). Interestingly, 39% respondents said they would avoid working with a suspected Covid-19 patient. However, similar proportion of people disag-reed with that statement. One surprising finding was that 11% respondents believed that only sick people need to wear masks. It seems that there is still some ambiguity regarding the necessity of face mask use. Similar observation was reported by Modi, Pranav D et al in their study.[9] Eighty- three percent agreed that they would get tested if they showed signs and symptoms of the disease. Many of them were willing to get vaccinated for Covid-19.

We also observed that the respondents who were concerned about getting sick with the virus in the coming months had better hand washing habits. This could be because higher risk perception affects behavior change.[10] The level of concern among the participants also influenced their compliance with certain measures like social distancing. A lot of the preventive behaviours showed association with gender, which was not observed in other studies.

We also assessed the emotional well-being of the respondents. There were increased reports of anxiety,

worry and loneliness. Many participants complained of poor sleep. The participants felt less happy during the pandemic.

More than 80% of the medical students admitted to being cautious during the pandemic and had adopted preventive measures to protect themselves from the virus.

The biggest limitation of this study was its sampling method. The cross-sectional nature of the study could also be considered as a limitation.

Conclusion:

The majority of the medical students had knowledge about Covid-19 symptomology, disease transmission and prevention. A few knowledge gaps were identified in this study. Many of them were worried about themselves and their family contracting the disease. The majority of them showed good compliance towards preventive measures. A few negative psychological effects of the pandemic were highlighted in the study. Medical students showed willingness to attend additional lectures on Covid-19.

Authors Contribution:

KZ: Conceived and designed the study. Did statistical analysis and manuscript writing.
M.L: Manuscript writing and data collection.
HSL: Data collection, editing and review of manuscript.
SOS: Data collection and editing of manuscript
FI, RKA: Drafting, Revision and final approval.

Conflict of Interest: None

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Prophylactic Use Of Ivermectin In COVID-19 In Current Pandemic Among Health Care Professionals: A Tertiary Care Hospital Experience

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Abstract

Objectives: To evaluate the effectiveness of ivermectin in prevention of COVID-19

Methods: Single arm non randomized clinical trial done in Lady Willington Hospital, June 1st – 07th, 2020. All doctors working in unit 1 were advised to take the tabivermectinas a prophylaxis. Total 42 doctors actively working in the unit were given ivermectin. Although dosage is adjusted according to body weight but for average weight dose is 2 tablets of 6 mg taken 12 hrs apart, a total of 3 doses. Primary end point was symptom free period and PCR negative for COVID-19.

Results: 42 frontline doctors were advised to take tab ivermectin during peak of COVID 19 in Pakistan which was the first week of June as a prophylaxis. The age of doctors ranged from 25 to 52 years. Only one doctor did not take the drug and 2 doctors developed COVID. One who did not take the drug was 26 years of age developed loss of smell and fatigability and was tested positive. She was quarantined for two weeks although the symptoms subsided after 5 days. The other subject 27 years of age was asthmatic. She developed mild fever and sorethroat and was also tested positive for infection. She was also quarantined for 2 weeks but her symptoms subsided after 7 days.

Conclusion: Ivermectinis an FDA approved antiparasitic drug easily available, low cost with minimal side effects and proved to be very effective against COVID 19 but requires further evaluation in larger population. More research is needed to determine if an antiviral effect would be elicited in humans, as the concentrations tested were much higher than what is achieved from the normal oral dose.

Keywords: COVID 19, Health care professional, Ivermectin , prophylaxis

Introduction

Ivermectin is an FDAapproved broad spectrum anti- parasitic that in recent years has shown to have anti-viral activity against abroad range of viruses. The causative agent of the current COVID-19 pandemic, SARS-CoV2, is a single stranded positive sense RNA virus that is closely related to severe acute respiratory syndrome coronavirus (SARS-CoV). Studies on SARS-CoV proteins have revealed a potential role for IMPα/β1 during infection in signal-dependent nucleocytoplasmic shutting of the SARSCoVNucleocapsid protein[1,2,3,] that may impact host cell division.[4,5] In addition, the SARS-CoV accessory protein ORF[6] has been shown to antagonize the antiviral activity of the STAT1 transcription factor by sequestering IMPα/β1 on the rough ER/ Golgi membrane[6]. Taken together, these reports suggested that ivermectin's nuclear transport inhibitory activity may be effective against SARS-CoV- Ivermectin has an established safety profile for human use[7,8,9] and is FDA-approved for a number of parasitic infections.[7,9] Importantly, recent reviews and meta-analysis indicate that high dose ivermectin has com-parable safety as the standard low-dose treatment.

Several countries have initiated clinical trial on ivermectin. The National University of Singapore serves the island nation as a tertiary hospital, clinical training center, and research center for medical and

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dental faculties. With 1,160 beds serving more than 670,000 outpatients and 49,000 inpatients, NUS is ranked first in Singapore & Asia Pacific and 11th in the world, according to the 2019 QA World University Rankings. This prestigious research organization initiated a large randomized Phase III open-label prophylaxis trial among migrant workers at high-risk of COVID-19; this study is known as the DORM Trial. Among the prophylaxis under investigation, hydroxychloroquine and Ivermectin are included. The study is led by Senior Consultant, Division of Neurology, Department of Medicine at NUS, Associate professor Seet Chee Seong Raymond[10].

The recent report by Caly et al.[13], describing the antiviral potential of ivermectin against the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in vitro arrive to the agenda of potential candidates for COVID-19 treatment. This discovery gave hope to the researchers who are screening for drugs that can be repurposed for treating the Coronavirus Disease 2019 (COVID-19)[12]. The frontline staff were exposed to this deadly virus despite PPE. But to wear it for 24 hours in hot June of Pakistan is impractical. Also emergency duty in labor room includes lot of immediate emergency measures like CPR and during these times it is difficult to follow protective measures.

Methods

A single arm non randomized clinical trial was carried out at Lady Wallington Hospital from 1st to 7th June, 2020. 42 doctors after an informed consent and approval of Ethical Review Board were advised about regular intake of supplements like vit c and zinc and additionally were given ivermectin. Although dosage is adjusted according to body weight but for average weight dose is 2 tablets of 6 mg taken 12 hours apart a total of 3 doses. Cost of one tab is Rs: 33 and total cost of course was Rs: 210.Primary end point was symptom free period and PCR negative for COVID-19. Data was entered and analyzed in Excel sheet.

Results

The whole team of unit I LWH comprising of 42 was advised to take tab ivermectin during peak of COVID 19 in Pakistan which was the first week of June as a prophylaxis. The age of doctors ranged from 25 to 52

years. Only one doctor did not take the drug and 2 doctors developed COVID. One who did not take the drug was 26 years of age developed loss of smell and fatigibility and was tested positive. She was quarantined for two weeks although the symptoms subsided after 5 days. The other subject 27 years of age was asthmatic. She developed mild fever and sore throat and was also tested positive for infection. She was also quarantined for 2 weeks but was symptom free after one week. None of the doctor experienced any side effects.

Discussion

In the study by Caly et al., Vero-hSLAM cells were treated with ivermectin after 2 h of SARS-CoV-2 infection, resulting in ~5000-fold reduction in viral RNA after 48h[1]. Although the positive result obtained in the in vitro studies suggests the possible in vivo antiviral potential of ivermectin, further validation using an efficient in vivo model is still required[13].

Besides, although ivermectin has been reported to exert potent antiviral activity against many viruses, its application is mainly hampered by pharmacokinetic problems such as high cytotoxicity and low solubility. To overcome these problems, various liposomal systems have been engineered and used as ivermectinnano carriers in several cell lines, which resulted in lower cytotoxicity than that of free ivermectin. Before considering ivermectin for widespread use as an antiviral agent, detailed in vivo and in vitro investigations of its effect in various animal models and cell culture systems are of utmost importance.[14]

The in vitro antiviral activity of ivermectin against SARS-CoV-2 has further extended the antiviral spectrum of this drug. As ivermectin is an United States Food and Drug Administration (FDA)-approved drug, repurposing it for anti-SARS-CoV-2 therapy will not be a problem. Nevertheless, the real question is, will it reach the stage of randomized clinical control trials in SARS-CoV-2-infected patients, or will it fail in the in vivo study stage? Although no clinical trials have reported its efficacy and safety in the context of COVID-19 yet, is expected to see in the near future them, delivering information about its potential therapeutic action in the clinical setting.

As proposed by Lauren Mickey that this cost effective

and easily available drug has been used for successfully treating COVID-19 patients.[15]

Ivermectin is now approved in Peru, government's decision was not based on formal, randomized controlled trials. An informal network of many doctors around Peru drove a kind of community movement to use the medicine to treat COVID-19. The government came to the conclusion that a sufficient number of experts in that country had formed a consensus that couldn't be ignored.[16]

Conclusion:

Ivermectin is an easily available, cost effective, with minimum side effects drug that proved to be very effective for COVID 19 prophylaxis in first line workers in our unit. More research is needed to determine if an antiviral effect would be elicited in humans, as the concentrations tested were much higher than what is achieved from the normal oral dose.

Authors Contribution:

AA: Conceived the idea of this study and collected data, manuscript writing and editing data.

AM: Supervision of this project

JM: Manuscript writing, revising the anuscript, and approval the final version

NA: Data Collection.

ZJ: Data Compile.

Conflict of Interest: None

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Awareness of Pakistani Medical Students and Interns about COVID 2019

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Abstract

Objective: The objective of this study was to determine knowledge and awareness among medical students and interns regarding COVID-19.

Materials and Methods: An observational cross-sectional survey with 217 participants was carried out among medical students and interns of King Edward Medical University, and Mayo Hospital Lahore from March to May 2020.

Results: Among participants, 62.2% were female, with 134 (61.8%) medical students and 83 (38.2%) medical interns. Social media was the most common source (39.9%) of information regarding COVID-19. Medical students and interns alike had good knowledge regarding the pandemic status of COVID-19 (91.7%); the relationship of COVID-19 with other coronaviruses; presence of asymptomatic carriers (84.3%); crude mortality rate (77.4%); and preventive measures (98.6%). However, knowledge about virus structure, genus, transmission, epidemiological characteristics, diagnosis, prevention and treatment was found to be inadequate among both interns and students.

Conclusion: There is poor over all knowledge among medical students and interns regarding COVID-19, especially during a pandemic. Steps must be taken to improve knowledge by introducing changes in curriculum related to emerging diseases, and by active participation of medical students in learning and dissemination of information on COVID-19.

Keywords: COVID-19, Medical students, Internship and residency, Awareness, Curriculum.

Introduction

The novel corona virus disease (COVID-19), with its first case reported in Wuhan, China in December 2019,[1] has now become a raging pandemic affecting more than 21 million people globally; and as of 16th August 2020, has reached a death toll greater than 0.7 million people.[2] It has henceforth been declared a public health emergency by US Centers for Disease Control (CDC).[3] This strain of coronavirus is a betacoronavirus, consisting of a positive sense single stranded RNA and has been largely isolated from bats. This outbreak serves as clear evidence of its zoonotic as well as human to human transmission.[4]

Previously, epidemics due to other coronavirus diseases have been reported by the WHO. A SARS-CoV epidemic occurred in China in 2002, and MERS-CoV epidemic occurred in Saudi Arabia in 2012.[5] There is a great need for awareness about COVID-19 as previous studies conducted during other epidemics have shown that adherence to precautionary measures is influenced by the insight of the population regarding the problem.[6,7]

Healthcare professionals and medical students in their clinical years are at a risk of both contracting the virus and spreading it to more susceptible individuals (people with comorbidities), and are also responsible for the initial recognition and detection of signs and symptoms in patients.[8] Since they also serve as health advocates in the society, it is imperative for them to be

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knowledgeable regarding the transmissi-bility, diagnostic tests, treatment and prevention of the disease.

The aim of this study is to assess awareness among medical students and interns regarding structure, transmission, infectivity, diagnosis and treatment of COVID 19. This will help us to identify gaps in knowledge and awareness, and to propose methods by which these can be improved for better provision of healthcare as well as better dissemination of relevant knowledge to the COVID-19 affected populace.

Methods

An observational cross-sectional study was carried out among clinical year medical students (3rd year to final year) of King Edward Medical University and medical interns working in general surgery, internal medicine and allied specialty departments of Mayo hospital, Lahore. Non-probability sampling was carried out: a random set of students and interns, identified through university and hospital records, were sent an online survey. Acceptance of online invite was taken as voluntary participation in the study. Pre-clinical medical students, students from allied health departments, residents and medical officers were excluded from the study.

Data was collected using a 19 item self-designed questionnaire based on objective type, multiple choice short questions, which tested the knowledge of medical students and interns across three domains: their knowledge of virology and disease transmission pattern; their awareness of epidemiological characteristics; and their knowledge regarding diagnosis, preventive measures and treatment. Questions were drafted from previous literature regarding awareness of medical students about MERS and influenza during pandemics[9-11] and were evaluated by experts in internal medicine and infectious diseases prior to dissemination.

Statistics

Data was analyzed using Statistical Packages for Social Sciences (SPSS) version 26.0. Qualitative statistics such as gender, prior knowledge, sources of information, and responses to the questions were determined as frequency and percentages. For descriptive variables such as age and total score across

each domain tested, mean and standard deviation were calculated. Independent t-test was used to determine association of gender, status as medical student or intern, and prior knowledge with scoring in each domain, whereas one way ANOVA was used to determine association of year of medical education, department of intern, and source of information with total score in each domain, with P value <0.05 being considered significant.

Results

Out of 450 participants who were invited to partake in the survey, a total of 217 participants responded, including 37.8% (n=82) males and 62.2% (135) females. Mean age of the participants was 22.99 ± 1.73. Eighty three (38.2%) medical interns and 134 (61.8%) medical students participated. The various demographic details of the participants are outlined in table 1.

A 19 item questionnaire was used to assess awareness among medical students and interns. The answers of the respondents are summarized in table 2.

Independent t-test was used to determine the correlation between score in each domain with gender, prior knowledge, and student/intern status. The mean score of knowledge regarding virology was 4.14±1.48 out of total 8; mean score in epidemiology was 3.46±1.07 out of total of 6; whereas mean score in prevention and management was 3.05±0.75 out of total 4. No significant association of gender with total score in any of three domains was found by independent t-test (P>0.05). Interns (4.39±1.48) had significantly higher knowledge of virology compared to medical students (3.98+1.47; however, no significant differences in knowledge were observed in the other two domains. Prior knowledge of COVID-19 (present = 4.45±1.44; absent=3.89±1.48) was also significantly associated with better knowledge of virology; no corresponding association was recorded with knowledge of epidemiology or disease prevention and management. Table 3 summarizes the results of significant correlations on independent samples t-test.

Tables 4 and 5 shows the results of one-way ANOVA with post-hoc Tukey test for knowledge across domains with year of medical education. No significant associations were determined between know-

Table 1: *Demographics of Study Participants*

Variable	Category	Frequency
Gender	Male	82 (37.7%)
	Female	135 (62.2%)
Student or Intern	Medical Students	134 (61.8%)
	Medical Interns	83 (38.2%)
Academic Year for Medical Students	3rd year	38 (28.3%)
	4th year	33 (24.6%)
	5th year	63 (47.0%)
Department of Internship	General Surgery	14 (16.8%)
	Allied Surgery	19 (22.8%)
	General Medicine	24 (28.9%)
	Allied Medicine	26 (31.3%)
Prior knowledge of COVID-19 before the outbreak in Pakistan	Yes	97 (44.7%)
	No	120 (55.3%)
Source of information regarding COVID-19	Lecture, Conference or Seminar in Medical College	49 (15.4%)
	Social Media	127 (39.9%)
	Print Media	28 (8.8%)
	Television	42 (13.2%)
	Mosque	3 (0.9%)
	Local Community	19 (5.9%)
	Government Press Release (from Ministry of Health)	11 (3.5%)
	Never heard of it before	39 (12.3%)

ledge and source of information or department of medical interns.

Discussion

Currently the COVID-19 pandemic is rampant across the globe. In light of the recent circumstances, it became crucial to carry out a study to assess the awareness of our medical students and interns, with regards to the structure, transmission, infectivity, diagnosis and treatment of COVID-19. No such study had been carried out until now, thus further high-lighting its need.

Our study revealed social media as the most popular source of information (40%). The role of social media in disseminating healthcare information is documen-ted in literature; sometimes, it might even be the only channel of pursuing and sharing health informa-tion.[12] Healthcare information on social media is a two-edged sword; while it can benefit a large amount of the population, wrong information or communi-cative gap can potentially cause harm as well.[13] Research from the Ebola outbreak in Africa shows that social media users can consciously choose to engage with particular healthcare information during

a pandemic, and their online behavior can determine the degree of information amplification.[14]

Knowledge scores regarding virology were found to

Table 2: *Responses to Questionnaire on Awareness Among Medical Students and Interns*

Question	Correct Response n(%)
Section 1: Knowledge of Virology	
In your opinion n -COVID-19 stands for?	90 (41.5%)
COVID-19 is caused by which virus?	116 (53.5%)
Have you heard of any other Corona virus diseases before?	112 (51.6%)
	84 (38.7%)
	21 (9.7%)
In your opinion, is COVID-19 related to SARS and MERS?	173 (79.7%)
What is the structure of virus causing COVID-19?	166 (76.5)
To what genus does the virus causing COVID-19 belong to?	35 (16.1%)
The median incubation period of this virus is:	33 (15.2%)
The primary host for the new corona virus is:	151 (69.6%)
The virus responsible for COVID-19 can be transmitted by:	136 (62.7%)
Section 2: Knowledge of Epidemiology	
The WHO has declared COVID-19 as which of the following?	199 (91.7%)
Can a person be infected with COVID-19 and not have any symptoms?	183 (84.3%)
The fraction of moderate to severe COVID-19 infections requiring hospitalization is:	63 (29.0%)
The fraction of severe COVID-19 infections requiring artificial ventilation is:	62 (28.6%)
The crude mortality ratio of COVID-19 is:	168 (77.4%)
What is the estimated number of COVID-19 infected patients globally in February 2020?	77 (35.5%)
Section 3: Knowledge of Prevention and Management	
Prevention of spread of COVID-19 is by?	214 (98.6%)
Is there an available vaccine for COVID-19?	204 (94.0%)
What is the confirmatory test for COVID-19?	143 (65.9%)
Treatment of COVID-19 is?	106 (48.8%)

be low among the participants (mean 4.14 out of 8). This points towards the general lack of knowledge among students and interns in basic sciences. In a

Table 3: *Correlations Knowledge of Virology on Independent T-test*

Correlation between Variables	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F		t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Total Score in Virology (Students vs Interns)	0.845		-1.998	215	.047	-0.412	-0.819	-0.005
Total Score in Virology (No prior knowledge vs prior knowledge)	0.020		2.809	215	0.005	0.561	0.167	0.956

Table 4: *ANOVA Showing Correlation Between Knowledge Across Domains with Year of Medical Education*

Correlations		df	F	Sig.
Total Score in Epidemiology	Between Groups	3	5.825	.001
	Within Groups	213		
Total Score in Prevention and Management	Between Groups	3	7.699	.000
	Within Groups	213		
Total Score in Virology	Between Groups	3	4.284	.006
	Within Groups	213		

study carried out on healthcare professionals regarding MERS-CoV infection in Madina in 2019, similar results were reported regarding lack of knowledge in virology, with only 44.5% of the participants knowing that MERS-CoV was an RNA virus.[15] A study from Saudi Arabia showed how inadequate history taking skills, and poor recognition of signs and symptoms of MERS-CoV infection contribute to mismanagement and misdiagnosis of the patients[16]. In a study assessing knowledge of Saudi medical students regarding MERS-CoV, 86% of students were unaware of its structure as a betacoronavirus, while 80% were unaware of the structure of single stranded RNA viruses.[9] A knowledge, attitude and practice (KAP) study from Saudi Arabia identified that about 67.6% of the participants had poor knowledge and 91.8% had a negative attitude with regards to MERS-CoV infection.[17]

Students and interns equally did not have sound knowledge regarding the epidemiology of COVID-19. Around 71% of our participants had no knowledge of the fractional percentage of patients that might require hospitalization and assisted ventilation. This is contrasting to a study conducted in Saudi Arabia during the outbreak of MERS, where medical students' knowledge regarding the transmission (97.1%), and treatment options (61%) for MERS showed far better results.[9] Similarly, poor results regarding knowledge, awareness and practice regarding swine flu during an epidemic were reported from Gujrat, India, in which only 16% were aware of diagnosis using a throat swab and 30% respondents had correct information about management guidelines for swine flu.[11] An earlier study conducted to assess the knowledge of medical students regarding influenza pandemic at the University of Alberta also showed significant gaps regarding knowledge of transmission, prevention and treatment among medical students.[10]

Apart from this, the comprehension of the treatment options available was limited, with more than half of participants (51.2%) failing to understand that fluids and supportive care are the mainstay of treatment of viral infections like COVID-19. The role of antivirals in treating COVID-19 is yet to be established, and so far no conclusive evidence is available in this regard.[18]

Table 5: *Post-hoc Tukey Test Showing Correlation between Various Years of Medical Education with Score Across Domains*

Dependent Variable	(I) Academic Year	(J) Academic Year	Mean Difference (I-J)	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Total Score in Epidemiology	3rd Year	5th Year	.804*	.001	.2529	1.3561
Total Score in Prevention and Management	3rd Year	4th Year	-.598*	.004	-1.0458	-.1520
		5th Year	-.669*	.000	-1.0554	-.2838
Total Score in Virology	3rd Year	5th Year	.811*	.036	.0374	1.5858
*. The mean difference is significant at the 0.05 level.						

Medical students and interns, being health advisory as well as advocates, play an integral part in our community. They should remain up to date with regards to both the pathological and the clinical features of COVID-19. The shortcomings we witnessed in the basic knowledge of our medical students can be overcome by devising a curriculum that covers the pathological, epidemiological and clinical aspects of COVID-19.[19]To deal with health emergencies such as the COVID-19 pandemic, medical students should undertake courses in tropical medicine, field epidemiology, and infectious diseases as part of their medical curriculum.[20] More immediate solutions could be online education through short certificate courses for medical students and simulation based learning for real world situations.

This study has certain strengths and limitations. To our knowledge, it is the first study of its kind reporting awareness of COVID-19 among medical students and interns in Pakistan. It highlights the lack of knowledge of students and interns about an ongoing pandemic, and suggests approaches to address areas where students are lacking. It also shows how factors such as prior knowledge of COVID-19 and sources of information can affect awareness among medical students in different years of medical education.

Limitations of the study include its cross-sectional design; and the lack of a comparable cohort from other medical institutes and private sector hospitals.

Conclusion

Our study showed that both medical students and interns have poor knowledge regarding virology, transmission and epidemiology, and treatment of COVID-19 during a pandemic. While the knowledge of interns and final year medical students was significantly better regarding basic virology, it was still inadequate across all three domains tested in our study. Participants had a good knowledge regarding preventive measures, which is an important aspect of practice in the setting of COVID-19 pandemic. Since the COVID-19 pandemic is an evolving situation, our study could serve as a baseline study for future comparisons of knowledge of healthcare professionals and medical students both during this pandemic and future outbreaks, and can help design policies to improve continuing medical education and clinical practice.

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Emergency Operations Upon COVID-19 Patients: A Single Unit Experience from Pakistan

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Abstract

Objective: To document the outcome of COVID-19 positive cases undergoing emergency operation at our unit.

Methods: We carried out an observational study at our unit from April to August 22020.. All patients who tested positive for COVID-19 via PCR and underwent emergency surgery during this period were included in the study after consent. History, examination and work up of all patients was done as indicated. Chest X-Ray and PCR for COVID-19 was done in all patients. All patients were initially resuscitated and then proceeded for surgery as indicated. All data was recorded on proforma. The data were analyzed through Excel 2013 for Windows. Nominal variables were reported as frequency and percentages. Numerical data was reported as mean ± standard deviation.

Result: Ten cases were included in the study. Of the 10 patients, 7 were male and 3 were females. The ages of the patients were between 28 to 66 years with the average age being 45.2+/-12.87 years. 6 patients presented with acute abdomen in the emergency department while 4 were already admitted in the COVID ICU. 4 patients were diagnosed as having pneumothorax while 6 were diagnosed as acute abdomen.3 of the 10 patients expired during their stay in the hospital while 7 patients got discharged. Average hospital stay of the patients was 6.3 days. The overall mortality rate was 30 %.

Conclusion: Safely operating upon COVID-19 patients is possible while performing surgery in line of recommendations.

Keywords: Emergency Surgery, Acute condition, COVID-19, Pakistan

Introduction

SARS-COV-2 is a highly infectious virus which belongs to the coronavirus family. It is transmitted mainly through droplet transmission. Incubation period is usually around 4-8 days. It usually causes mild to no symptoms in the younger population but can be devastating in the elder and patients with co-morbidities. Common symptoms include cough, fever, dysnea, diarrhea, and vomiting and muscle soreness.[1]

Main precaution in prevention of the disease is social distancing and masking. As a result of the rampant spread of the disease throughout the world various countries have been forced to adopt some form of imposed social restriction.[2] Furthermore there has been a trend throughout the world to avoid or delay cases of major surgery since the intubation process is associated with a marked risk of infection.[3] Plus keeping patients in hospital during a pandemic when such resources are direly needed elsewhere is unethical and also increases the risk of infection.[4] Hence elective surgeries and even oncological surgeries haven been postponed or delayed the world over.[5]

However, the same would not be possible in cases of acute emergency. It imposes multiple stresses upon the operating team. Patients in such cases usually present in a critical condition where intervention can make the difference between life and death.[6] However

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the time to carry out tests is limited and often these are diagnosed post operatively. Hence the risk of transmission to other patients as well as to the surgical team is magnified. Furthermore the surgical team has to operate wearing several precautions which not only makes surgery difficult but the environment also very uncomfortable.

Our unit belongs to one of the biggest tertiary care hospitals of the province of Punjab. Located on one of the main road of the city of Lahore it provides easy access to residents of the city as well as referrals from other cities. We perform 36 hours of emergency duty per week. Since the beginning of the pandemic we have continued to provide emergency services as routine. Real-time Polymerase Chain Reaction (RT-PCR) has been declared to be the most reliable test for the detection of SARS-CoV-2 infection.The current incidence of the COVID-19 disease in Pakistan is identified by a positive test result.[7] During this time we have operated upon 10 COVID-19 positive patients. Even though status of not all these patients was known at the time of operation all were PCR positive.

Methods

This case series includes patients from April 2020 to August 2020. It was carried out at Surgical Unit 1, Services Hospital, Lahore. All patients who underwent any acute surgery and tested positive for COVID-19 via PCR were included in the study. Sampling was done by convenience sampling. Patients not consenting to participate in the study were excluded. History, examination and workup of all patients was done as indicated. Chest X-Ray and PCR for COVID-19 was done in all patients. All patients were initially resuscitated and then proceeded for surgery as indicated.

All data was recorded on proforma which included patient's demographic details, interventional procedures undertaken, duration of hospital stay, ICU and ventilator support, length of hospital stay, outcome of patient and operating team infection if any. The data were analyzed through Excel 2013 for Windows. Nominal variables were reported as frequency and percentages. Numerical data was reported as mean ± standard deviation.

Table : *summary of COVID Positive Patients Undergoing Surgery*

SN	AGE	SEX	DIAGNOSIS	PROCEDURE	FINDINGS	Outcome	DOHS
1	40	M	Mesenteric Ischemia e Perforation	Exploratory Laparotomy with resection anastomosis of proximal jejunum and loop ileostomy	Patchy ischemia of proximal jejunum and distal ileum with perforation of terminal ileum	Expired	5
2	60	M	Duodenal Perforation	Exploratory Laparotomy and Neil's patch repair	About 1x1cm perforation in anterior wall of 1st part of duodenum and about 600ml of purulent fluid	Discharged	7
3	48	M	Strangulated Paraumbilical Hernia	Resection anastomosis of ileum and Mayo's repair of hernia	About 6cm of ischemic ileum	Discharged	3
4	39	M	Intestinal Obstruction	Exploratory Laparotomy	Cocoon abdomen and patchy ischemia	Discharged	6
5	28	F	Acute Abdomen after D&C	Exploratory Laparotomy	About 1x1cm perforation in posterior wall of uterus and about 700ml of pus in pelvis (pelvic abscess)	Discharged	3
6	30	M	Duodenal Perforation	Exploratory Laparotomy and modified Neil's patch repair	About 1x1cm perforation in anterior wall of 1st part of duodenum and about 2 litres of bilious fluid containing gut contents	Discharged	7
7	62	F	Bilateral Pneumothorax	Bilateral chest intubation	Bilateral Pneumothorax (gush of air and collapsed lungs)	Discharged	14
8	54	F	Duodenal Perforation	Exploratory Laparotomy and Neil's patch repair	About 0.5x0.5cm perforation in 1st part of duodenum with diffuse fibrotic changes in anterior wall of pylorus and 1st part of duodenum with 300ml of pus	Expired	4
9	58	M	Pneumothorax	Chest intubation	Air in pleural cavity	Expired	12
10	33	M	Pneumothorax	Chest intubation	Air in pleural cavity	Discharged	11

Results

Of the 10 patients, 7 were male and 3 were females. The ages of the patients were between 28 to 66 years with the average age being 45.2+/-12.87 years. 6 patients presented with acute abdomen in the emergency department while 4 were already admitted in the COVID ICU. Of the 10, 4 were already diagnosed as COVID positive by PCR and other modalities while 6 presented with gastrointestinal symptoms and suspicious X-rays but were confirmed as COVID-19 post operatively after their PCR reports became available.

4 patients were diagnosed as having pneumothorax while 6 were diagnosed as acute abdomen. 4 patients had free gas under diaphragm. 3 of the 10 patients expired during their stay in the hospital while 7 patients got discharged. Average hospital stay of the patients was 6.3 days. The overall mortality rate was 30 %. The details are summarized in the table.

Discussion

Since being first detected in Wuhan, China the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has spread all over the world.[8] Every aspect of life has been affected by the COVID-19 outbreak.[9] In the past four months the almost every aspect of life has been touched by the pandemic. Restrictions in movements have led to an immense impact on economy and mental health of people. There has been a general restriction on the people and they are mostly bound to their houses with closure of schools, markets and places of entertainment. This has also led to a reduction in mobility and tendency of people to travel outside home for food.[10-13]

Elective lists have been markedly reduced all over the world. Cuts have been made to transfer these resources to the fight against the pandemic.[14-18] However the emergency cases cannot be postponed as such as there is the question of life and death.[19] Furthermore the emergency cases are often requiring urgent with not enough time for a comprehensive workup.

It is primarily for this reason that 6 out of the ten patients didn't have a preoperative confirmation at the time of them being taken to the operating table. Out of these 6 , 4 were suspected on the basis of their radiological findings on the Chest Xray which showed findings typical of COVID-19.[20] However all such cases were dealt with extreme caution and all precaution as per guidelines[19] were taken. It is as result of these efforts that despite operating upon 10 confirmed positive case no member of the surgical team involved in the management of these patients has testing positive so far.

An interesting observation which we came upon was a cluster of duodenal ulcer perforations. We had a total of five such cases however two cases are not included in the study since one patient expired before PCR sampling could be done and the second refused PCR sampling. Both the excluded patients had findings typical for COVID-19 on CXR. None of the patients had any risk factors[21] for duodenal ulcers. Furthermore two other patients had ischemic gut while having no previous history or risk factors. Gut symptoms have been reported to happen in COVID-19 patients and the virus has been demonstrated to be present throughout the gut.[22] Considering these two observations we believe that these perforation were infact caused by COVID-19 although the exact mechanism is not known.

4 patient who underwent intervention were already admitted in the COVID-ICU which had been established at our hospital especially for the management of COVID-19 patients. All of these patients were PCR positive at the time of intervention and were on ventilator support. It has been reported that a high incidence of barotrauma is seen in COVID-19 patients on ventilation. [23]

Conclusion

Safely operating upon COVID-19 patients is possible while performing surgery in line of recommendations. A link between gut pathology (gut ischemia and duodenal perforation) and COVID-19 is suggested and needs to be investigated further.

Authors Contribution:
MU, UIB, ZH, MK: Study design, Statistical analysis, protocol, first draft of manuscript.
study, statistical analysis, literature review
SUB, MA, HA, NA, AB, ZA, NF: Data collection

Conflict of Interest: None

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Effect of COVID-19 on Surgical Workload: An Experience from a Single Unit

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Abstract

Objective: To document the effect of COVID-19 on surgical workload of our unit.

Methods: We performed a retrospective analysis of the patients beings operated in our unit. We evaluated both emergency and elective cases. Two time periods were selected. The study period was defined as the time from first confirmed case of COVID-19 in Pakistan (1st March to 31st July, 2020). The control period was defined as 1 year prior to the first case being reported. We took this from 1st March 2019 to 29th February, 2020. We calculated the total number of cases done in the periods as well as the monthly average. Stratification by type of cases was also done. This was done for both the elective and emergency lists.

Result: A decrease in cases was seen in both the elective and emergency lists, however, as expected the decrease in elective list was very marked. From 1st March 2019 to 31st July 2020 our unit performed a total of 1527 surgeries in the emergency department. Out of these 1110 were performed in the year before the COVID-19 with an average of 92.5 cases a month while during the COVID-19 months 417 cases were performed in the emergency with an average of 83.4 per month. Thus there is a slight decrease in monthly cases in the emergency. Similarly on the elective side 879 cases were performed during the year before COVID while only 48 cases were done during the COVID months of which more than 90% were tumors. Here the difference is marked when we consider the monthly average which was 73.25 cases per month before COVID but decreased to just 9.6 per month during COVID.

Conclusion: COVID-19 has caused a reduction in number of surgeries being carried out including both emergency and elective with the effect being more marked on elective lists.

Keywords: COVID-19, Lahore, Surgical WorkLoad, Pakistan

Introduction

After being first reported in Wuhan China in December of last year the COVID-19 has spread across the world like a fire.[1] It is now known that it affects mainly the respiratory system but also causes generalized thromboembolic symptoms. It is caused by a virus belonging to the Corona virus family.[2] It has been declared as a pandemic by the WHO with hardly any country of the world being spared from the disease. [3]

The virus first made its presence known in Pakistan by the end of February, 2020 and the first case in Punjab soon appeared by the mid of March, 2020[4]. The burden of the disease is so much that it has caused even the best of healthcare systems to buckle under its pressure.[5]

All across the world health managers have had to adopt radical measures to fight the disease. Elective cases being put to the back burner is one of them.[6] It was however assumed that the urgent cases would continue to present as such. However this notion has not proven to be right as per the various reports available from different parts of the world which show that there has been a decrease in the number of cases requiring acute care.[7] The exact cause for this is debated however it is believe to be a combined effect of postponement of elective cases, various shades of social restrictions, reduction in daily activities and commerce related activities, closure of school, reduction in meals from outside and fear of patients.

A similar situation and similar measure had been adopted in our country as well. The lockdown impo-

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sed in Punjab on 24th March 2020 has only just recently been lifted completely.[8] There was a complete closure of all services except emergency services for the first few weeks of the lock down. But there was a gradual resumption of the outpatient and elective list. Although the number of cases were low. Our hospital has been declared a COVID-19 hot facility. Despite this all other services of the hospital are also being run. It is located in the heart of Lahore having a capacity of 1450 beds which makes it one of the biggest in the province of Punjab. Our unit is one of the 4 surgical units at our hospital. We have twice a week outpatient department, two a week surgical lists and 36 hours of emergency duty every week. We mainly deal with general surgical and laparoscopic cases.

In view of the reports from various parts of the world we decided to evaluate the surgical workload at our unit to evaluate the effect the COVID-19 has had. Our aim in this study was therefore to investigate the possible effect on patient load during the COVID-19 outbreak at our unit.

Methods

We performed a retrospective analysis of the patients beings operated in our unit. We evaluated both emergency and elective cases. Two time periods were selected.

The study period was defined as the time from first confirmed case of COVID-19 in Pakistan (1st March to 31st July, 2020). The control period was defined as 1 year prior to the first case being reported. We took this from 1st March 2019 to 29th February, 2020. We calculated the total number of cases done in the periods as well as the monthly average. Stratification by type of cases was also done. This was done for both the elective and emergency lists.

Results

A decrease in cases was seen in both the elective and emergency lists, however, as expected the decrease in elective list was very marked. From 1st March 2019 to 31st July 2020 our unit performed a total of 1527 surgeries in the emergency department. Out of these 1110 were performed in the year before the COVID-19 with an average of 92.5 cases a month while during the COVID-19 months 417 cases were performed in the emergency with an average of 83.4 per month. Thus there is a slight decrease in monthly cases in the

emergency. Similarly on the elective side 879 cases were performed during the year before COVID while only 48 cases were done during the COVID months of which more than 90% were tumors. Here the difference is marked when we consider the monthly average which was 73.25 cases per month before COVID but decreased to just 9.6 per month during COVID. Results are summarized in the tables and charts.
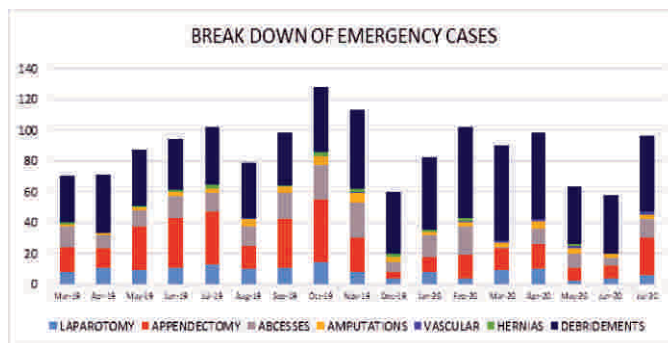

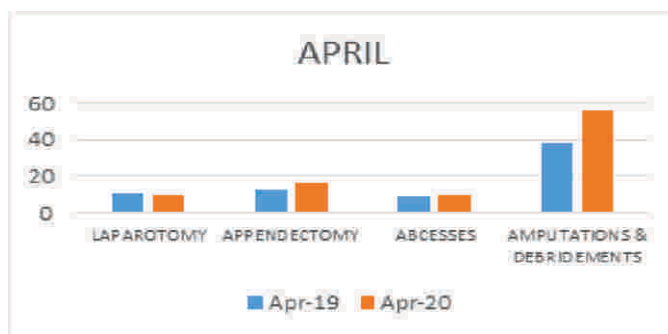**Chart 1:** *Break Down of Monthly Emergency Cases Since March 2019*

CHART 4: *Comparison of Average Monthly Cases on Elective List Before and During COVID-19*

Discussion

COVID-19 has brought about changes in every sphere of life. Hardly any country of the world has been left isolated. No sphere of life has been spared from the effects of the disease.[9] Most countries of the world have imposed some form of social restrictions to combat the disease.[10] Health care systems the world
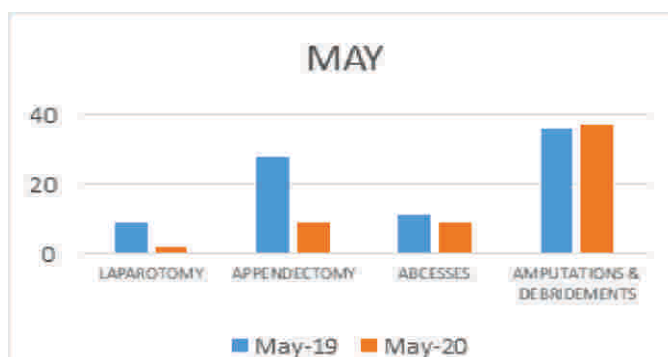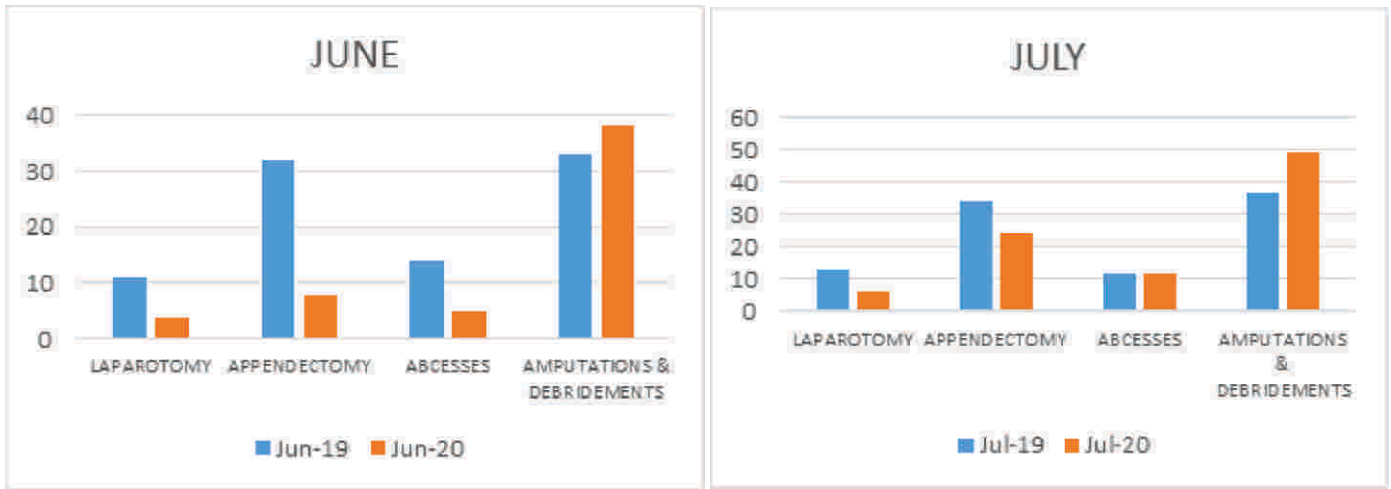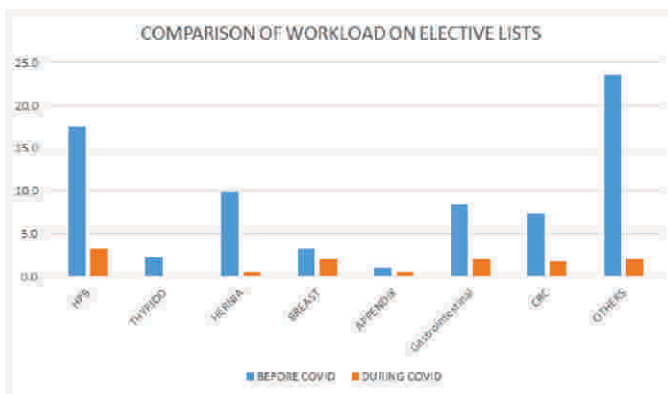
Chart 2: *Comparison of Emergency Cases Workload of COVID-19 Months with the Same Month's Workload During 2019*

Table 3: *Comparison of Cases Done in Year before COVID with Cases Done During COVID Month*

	HPB	THYRIOD	HERNIA	BREAST	APPENDIX	GIT	CRC	OTHERS
Year before COVID	211	26	119	39	12	101	88	283
During COVID	13	0	2	8	2	8	7	8

over have been focused in dealing with the disease. But steps have to be taken in order to ensure provision of care to non-COVID-19 patients as well. Initially it was feared that the healthcare systems the world over would be overwhelmed and collapse. Not only COVID-19 but other diseases would also cause things to spiral out of hand.

Although a dire situation has been created in some countries of the world, most of the world has been spared. Similarly we have also been lucky with less than 6000 mortalities due to COVID being reported by the end of July 2020.[11] However most of the healthcare system has been mobilized to combat the pandemic with delays in the management of other diseases.

The world over it has been reported that the elective cases have been postponed.[12] Similar is the case in our country. Our results show the same with a drastic decrease in the number of elective cases being done.

More than 90% of the cases done in the last 4 months were of tumours where the fear was that further delay may increase the morbidity of the patient.

In the emergency cases while a decrease in the number of cases was seen it was not as drastic as the fall in the elective cases. Similar reports have also originated in other parts of the world. Although the exact cause of this is still unclear it is thought that this is due to restriction of mass transit and other large movements of people which has contributed in a reduction in the number of accidents while decrease in eating out has resulted in a reduction in gastro-intestinal pathologies. The reduction in stress from daily life may also have had a positive effect.

There seems to be a tendency of patients to avoid hospitals at this stage. It is understandable since the fear of COVID-19 is still prevalent. However it is too early to comment if this change is permanent. We expect that a large surge of patients who had been postponed due to COVID-19 will present to us. Hence in a couple of months we expect that there will be a massive increase in the number of cases and huge pending lists of patients waiting for their turn for the operations provided there is no further wave of the pandemic.

Conclusion

COVID-19 has caused a reduction in number of surgeries being carried out including both emergency

and elective with the effect being more marked on elective lists. The exact factors behind it are uncertain.

Authors Contribution:

MU, SBT, ZH, SUBM MK: Study design, Statistical analysis, protocol, first draft of manuscript.

UIB, MA, MWA, RB: statistical analysis, literature review Data collection.

Conflict of Interest: None

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Effectiveness of Methyl Prednisolone in Covid19-Related ARDS: A Case Series

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Abstract

Objectives: Covid-19 is an emerging disease typically affecting respiratory apparatus. The main aim of this study was to analyze the effects of methyl prednisolone in Covid-19 related ARDS.

Methods: Methyl prednisolone was administered to twelve critical Covid-19 patients, to reduce respiratory distress and progressing disease.

Results: Methyl prednisolone therapy proved to be effective in treating critically ill Covid-19 patients.

Conclusions: Methylprednisolone hasa potential to control deteriorating Covid-19 related lung damage. The acclaimed role of methylprednisolone in Covid-19 disease, needs to be further verified by conducting similar studies on a large scale.

Keywords: Methylprednisolone, Covid-19, ARDS.

Introduction

In December 2019, an outbreak of unexplained severe pneumonia suddenly erupted in Wuhan, China. The disease rapidly spread throughout most countries of the world and shook the global health system. The disease is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Therefore, the disease was later named as Covid-19, and was declared a pandemic . According to WHO's latest figures, 19,462,112 people globally are infected and over 722,285 people have lost their lives to Covid-19 till early August 2020 . Cases of Covid-19 are still on rise, and no vaccine or medication is as yet available for treating the infection.

Covid-19 damages the lungsprimarily by triggering the immune system to release a significant number of inflammatory cytokines leading to a cytokine storm.

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The cytokine stormultimately leads to acute respiratory failure after 5–7 days of onset of symptoms .

The current recommended treatment is to suppress inflammatory mediators responsible for cytokine storm resulting in better prognosis. Methyl prednisolone, an immuno suppressive drugis a potent agent hampering the progressive pneumonia, and has proven helpful in treating acute respiratory distress syndrome (ARDS).

Case Series

During April 2020 in Farooq hospital Corona Unit West Wood branch, Lahore, Pakistan; twelve Covid-19 patients were admitted to the intensive care unit (ICU). These patients had difficulty in breathing, and rapidly worsening oxygen levels. The diagnosis of Covid-19 was confirmed by performing RT-PCR (realtime-polymerase chain reaction).

Initially a generalized treatment regime was started to counter breathing diffculties and related symptoms in the patients. This treatment was continued for a period of between 2 – 12 days based upon the clinical condition and treatment response. The regime consisted of broad-spectrum antibiotics bronchodilators, anticoagulants and multivitamins etc. The specific medicines included Antibiotics (Meropenem, Piperacilline Tazobactam, Colistin, Levofloxacin, Moxifloxacin, Vacomycin), (Favipravir, Remedisivir), Antifungal (Voriconazole), low

molecular weight heparin (Clexane), Antihistamines (Fexofenadine),Anticoagulants, inhaled and nebulizer corticosteroids (Hydrocortisone) and Antrovent (Anticholinergic bronchodilator), Ventolin and leukotrieneantagonists like intravenous immuno-globulin (Pentaglobulin), montelukast (Myteka), Tocilizumab (immunosuppressive), and multivitamins.

Methyl Prednisolone pulse therapy of 1g per day for 3 days resulted in significant improvement of interstitial and alveolar infiltrates and CRP levels, reduction in oxygen demand, avoidance of invasive and non-invasive ventilation and at times halting disease progression. Poor response to the generalized regime, and the continually deteriorating clinical status of patients, led the clinicians to turn to an aggressive treatment strategy.

Fig. *Schematic Time Course of a Critically Ill Covid-19 Patient. Radiological Evolution of a Patient with Severe Acute Respiratory Distress Syndrome Related to COVID-19 Who was being Treated with Methyl Prednisolone*

Chest x-ray of these critically ill Covid-19 patients showed remarkable changes after being treated with methylprednisolone. Initially all patients presented with bilateral rather peripherally oriented patchy air space opacities in both lungs reflecting pneumonitis. The serial films indicated gradual and progressive resolution of pneumonitis shown in later images.

Pulse therapy in the current study was used as salvage therapy when all other treatment modalities failed to show any improvement, and surprisingly striking results were observed as mentioned below.

This regime consisted of intravenous (IV) administration of methylprednisolone pulse and supplemental high flow oxygenation therapy. The administration of methylprednisolone led to a marked reduction in the demand for supplemental oxygen over the next few days (rang: 0-3 days) based upon the initial clinical status.

In 4 patients, the need for supplemental oxygen came down to room air, 3 patients from BIPAP (bilevel positive airway pressure) to NRM (non-rebreather mask), 3 patients from high flow to a minimum of 3lpm (Liters per minute) of oxygen therapy. However, one elderly patient failed to respond even after a week of methyl prednisolone administration. CRP levels in all these patients declined tremendously, however, TLC (total leukocyte count) was recorded to be elevated in 5 patients ranging from 9.3-20, D-dimers in 2 patients ranging from 0.3-5.77 and creatinine in one patient ranging from 0.9-1.2. Out of these 12 patients, 6 received additional therapy comprising of Tocilizumab, remdesivir and faviparivir.

Among twelve patients, only two were females. The age range for these patients was 26-80 years. Only 2 patients expired despite receiving methylprednisolone, while rest recovered successfully.

Discussion

This paper reports a series of 12 Covid-19 infected patients presenting with ARDS. They were put on mechanical ventilation and had received early methylprednisolone therapy. Some of the studies on SAR-CoV (Severe acute respiratory syndrome–related coronavirus) and MERS-CoV (Middle East respiratory syndrome-related coronavirus) had reported severe lung injury. These changes have been attributed to a sudden burst of inflammatory cytokines termed as cytokine storm. In some previous studies on SARS-CoV and MERS-CoV, corticosteroids were administered to decrease cytokine storm associated lung injury and resultantly that led to improvement in clinical outcome of critical Covid-19 patients.

A low-dose methylprednisolone treatment (1 mg/ Kg/ day) produced remarkable clinical and radiological improvements in critically ill Covid-19 patients. The patients were gradually removed from ECMO (extra-corporeal membrane oxygenation), and mechanical ventilation support.

The efficacy of methyl prednisolone treatment for Covid-19 ARDS is still disputed and no confounding and concrete evidence is available as yet to support it. Recently, a retrospective cohort study was conducted on critically ill Covid-19 patients who received methyl prednisolone therapy for Covid-19 related

ARDS. The therapy proved to be successful by improving their clinical outcome .Similarly, high doses of Methyl prednisolone were administered intravenously, to severe Covid-19 patients. Fever was markedly reduced and the need for mechanical ventilation was gradually abated. This brought the survival rates upto100% and reintubation rates down to 0%, followed by complete withdrawal of ventilator support in all cases within seven days .

The Methyl prednisolone (corticosteroid) therapyto counter the effects of critical illness in Covid-19 patients proved to be successful in our setup. Out of 12 critical Covid-19 patients, 10 responded positively and showed significant improvement in their clinical status and overall survival. However, the acclaimed role of Methyl Prednisolone in Covid-19 disease, needs to be further verified by conducting similar studies on a large scale.

Author's Contribution

OF: Conceptualization, Analysis of Results, Supervision of the Project.
SW: Literature Search, Write up of Results & Discussion.
MK: Conceptualization &Analysis of Results.
FN, S R: Data Collection.
AM: Literature Search & Supervision of the Project.

Conflict of Interest: None

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Psychosocial Changes and Coping Strategies in Home Quarantined University Students of Pakistan Dduring COVID-19 Pandemic

Usama Naveed Cheema[1], Iram Manzoor[2], Abdul Rehman Rizwan[3], Uffaq Farrukh[4], Atika Masood5, GH. Saqib Kalyani[6]

Abstract

Objective: To assess the psychosocial changes in home quarantined university students of Pakistan during COVID-19 pandemic and to assess the counteract measures adopted by them during this period.

Methods: An analytical cross-sectional survey was conducted in Pakistan during June to July 2020. A representative sample of 1527 students was included from educational institutions of all four provinces of Pakistan including Islamabad. Convenient sampling technique was used for data collection through construction of online survey on Google forms. University students of age more than 18 years were included in the sample. Data was extracted into SPSS version 23. Results were presented in charts and tables. Bivariate analysis was done to assess gender differences in symptoms of depression and related disorders. Chi square test of significance was applied and p value was fixed at below 0.05 as significant.

Results: Out of 1527 university students, 839 (54.9%) were females. Maximum time of quarantine in home was reported more than three months in 817 (53.5%). Among these students 54.2% reported to be suffering from depression. Female gender showed significant high values for affective symptoms related to depression. Major signs shown with higher frequency in female gender were lack of sleep (p = 0.000), excessive worrying (p = 0.000), difficulty in making decisions (p = 0.000), reduced concentration (p = 0.007), restlessness (p = 0.000), irritability (p = 0.000), fatigue (p = 0.000), body aches (p = 0.000), feeling of guilt (p = 0.000), decreased performance in daily activities (p = 0.002), decreased appetite (p = 0.000) and lack of interest (p = 0.000).

Conclusion: This pandemic has created psychosocial changes among students during home quarantine. Female students are affected the most with these changes.

Key words: COVID-19, mental health, Students, Pakistan

Introduction

World Health Organization declared Corona Virus Disease 19 as a pandemic on March 11, 2020 which affected 213 countries worldwide and Pakistan was one of the affected countries with a large number of cases and high mortality.[1] Government of Pakistan followed the advice of World Health Organization and soon quarantine and isolation centers were established by the state. Another step taken by Government of Pakistan was to close all educational institutions on 13th March, 2020. This closure extended from 13th March to 15th September, 2020 extending for more than six months of home quarantine for all students.[2]

Home quarantine during this pandemic affected people at large, causing multiple psychological and social implications.[3] Social distancing has increased feeling of loneliness among the youth worldwide.[4] University students being home quarantined for more than six months have shown to develop insomnia, anxiety and depression.[5]

Worldwide people have used multiple coping strategies to combat the effect of COVID-19 related

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stress. Scientific evidence shows use of different strategies. Mostly the students are involved in excessive use of electronic devices for social networking and online academics, increasing their screen times which is considered a risk factor for depression.[6] Some students reported indulging themselves in physical activity to reduce COVID-19 associated depression[7], a few students tend to experience a journey towards self-realization and religious spirituality.[6] Limited evidence is available in Pakistani context. This study aims to assess the psychosocial changes and measures to counteract these changes, adopted by university students who have been home quarantined due to COVID-19 pandemic.

Methods

This online survey was conducted among students who are studying in various universities of Pakistan including University of Punjab, King Edward Medical University, University of Health Sciences, University of Lahore, University of Central Punjab, Agriculture University, Baha Uddin Zakariya University, Nishtar Medical University, Bolan Medical College, Quetta Institute of Medical Sciences, University of Karachi, Dow Medical University, Islamabad Medical and Dental College, Riphah International University, University of Peshawar and UET Peshawar. A cross sectional survey was conducted from 20th June to 15th July, 2020 by using online Google forms among students representing all areas of Pakistan. Non probability, convenient sampling was used to collect data. This time period reflects more than three months time of home quarantine of these students. An online survey was conducted and a sample of 1527 students was collected within one week of generating the questionnaire. Home quarantined university students both males and females from any discipline willing to participate in were included in this study. Duration of quarantine, psychosocial changes, coping strategies, and exposure to information regarding the pandemic were the variables of interest. Levels of depression and anxiety among students were assessed using DSM-V scale. After getting online data on Excel sheets, data was extracted and entered, coded and analyzed with SPSS version 23. Results were presented in the form of frequency tables and bar charts. Bivariate analysis was done to assess gender differences in psychosocial implications and coping strategies. Chi square test was applied for bivariate analysis and p-value was fixed at equal to or less than 0.05 as significant value. Before conducting this online survey, ethical issues including IRB approval, maintaining anonymity of participants, confidentiality of data and informed consent were taken in consideration.

Results

The total number of university students who completed the online questionnaire was 1527. The maximum number of students was between 21-23 years 990 (64.8%). Majority of the participants were female students 839 (54.9%). More than 34.6% (n= 528) of the participants reported period of home quarantine for more than 4 months. (Table 1)

The number of students afraid from the COVID-19 pandemic was 1050 (68.8%). Those who considered it a worldwide emergency were 1459 (95.5%). Major source of information of COVID-19 during this

Table 1: *Sociodemographic Profile of Students*

Variables	Frequency (n=1527)	Percentage (%)
Age distribution		
18-20 years	348	22.8
21-23 years	990	64.8
24-26 years	129	8.4
26 years onwards	60	3.9
Gender distribution		
Female	839	54.9
Male	688	45.1
Duration of quarantine in home		
1 month	53	3.5
2 months	63	4.1
3 months	817	53.5
4 months	528	34.6
5 months and/or more	66	4.3
Student tested positive for COVID-19		
No	1448	94.8
Yes	79	5.2
Any friends/ family members tested positive for COVID-19		
No	747	48.9
Yes	780	51.1

pandemic was social media among 1206 (79%) followed by television as 711 (46.4%). The other sources of information included print media 169 (11.1%), family and friends 413 (27.3%).

Out of 1527 students surveyed, 204 (13.4%) were those who were already suffering from past psychia-

tric or psychological disorders. Remaining data of 1323 (86.6%) students was evaluated to find out the effects of home quarantine on their psychosocial health. In response to the questions regarding their psychosocial health, the maximum students reported about lack of concentration, lack of interest in doing something, feeling of irritability and annoyance and fatigue. (Figure 1)
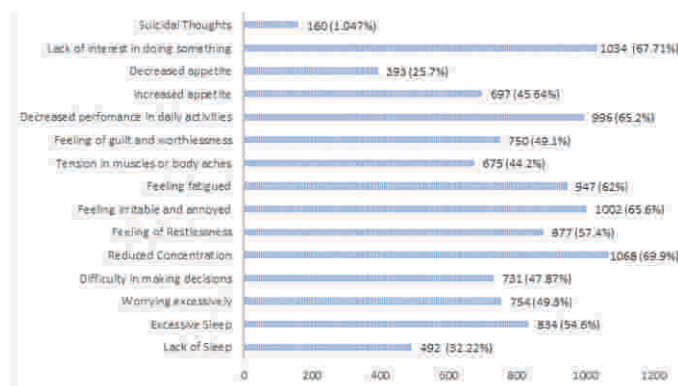

Fig.1: *Frequency of Symptoms Related to Psychosocial Health Among Sstudents*

After applying DSM-V scale, it was found that during this pandemic, students have suffered a lot of psychological signs and symptoms. Anxiety was reported in 872(57.1%) participants and the number of respondents having symptoms for depression was 828 (54.2%). These students opted multiple coping strategies to cope with the situation created by being home quarantine for more than three to four months which included watching seasons 928 (60.7%), 376 (24.62%) doing extracurricular activities like painting and singing, 743 (48.65%) opted to become more active on social media such as Facebook, Instagram, YouTube. Only 476 (31.17%) opted for improving academic skills. Out of 1527, 56 (3.6%) used antidepressants, 69 (4.51%) started smoking tobacco and 29 (1.89%) opted for using drugs to relieve stress during this period of home quarantine of COVID-19 pandemic.

Bivariate analysis was done to find out gender differences in psychosocial effects faced during home quarantine during COVID-19 pandemic. Results revealed that significant differences were observed in sufferings of females. Females are affected more as compared to males with psychosocial changes during home quarantine. (Table 2) No significant differences were observed between two genders for excessive sleep (p =0.422), increased appetite (p = 0.407) and suicidal thoughts (p =0.604).

Table 2: *Gender Differences in Psychosocial Changes among Home Quarantine Students during COVID-19 Pandemic*

Variables	Gender		Total	p-value
	Female	Male		
Lack of sleep				
Yes	313(63.6%)	179(36.4%)	492(100.0%)	.000 **
No	526(50.8%)	509(49.2%)	1035(100.0%)	
Worrying excessively				
Yes	449(59.5%)	305(40.5%)	754(100.0%)	.000 **
No	390(50.5%)	383(49.5%)	773(100.0%)	
Difficulty in making decisions				
Yes	442(60.5%)	289(39.5%)	731(100.0%)	.000 **
No	397(49.9%)	399(50.1%)	796(100.0%)	
Reduced concentration				
Yes	611(57.2%)	457(42.8%)	1068(100.0%)	.007**
No	228(49.7%)	231(50.3%)	459(100.0%)	
Feeling of restlessness				
Yes	520(59.3%)	357(40.7%)	877(100.0%)	.000 **
No	319(49.1%)	331(50.9%)	650(100.0%)	
Feeling irritable or annoyed				
Yes	615(61.4%)	387(38.6%)	1002(100.0%)	.000 **
No	224(42.7%)	301(57.3%)	525(100.0%)	
Feeling fatigued or getting tired easily				
Yes	567(59.9%)	380(40.1%)	947(100.0%)	.000 **
No	272(46.9%)	308(53.1%)	580(100.0%)	
Tension in muscles or body aches				
Yes	405(60.0%)	270(40.0%)	675(100.0%)	.000 **
No	434(50.9%)	418(49.1%)	852(100.0%)	
Feeling of guilt and worthlessness				
Yes	461(61.5%)	289(38.5%)	750(100.0%)	.000 **
No	378(48.6%)	399(51.4%)	777(100.0%)	
Decreased performance in daily activities				
Yes	576(57.8%)	420(42.2%)	996(100.0%)	.002**
No	263(49.5%)	268(50.5%)	531(100.0%)	
Decreased hunger or appetite				
Yes	247(62.8%)	146(37.2%)	393(100.0%)	.000 **
No	592(52.2%)	542(47.8%)	1134(100.0%)	
Feeling low and lack of interest in doing something				
Yes	610(59.0%)	424(41.0%)	1034(100.0%)	.000 **
No	229(46.5%)	264(53.5%)	493(100.0%)	
Suicidal thoughts				
Yes	91(56.9%)	69(43.1%)	160(100.0%)	.604
No	748(54.7%)	619(45.3%)	1367(100.0%)	

Discussion

COVID-19 has affected the individuals belonging to all social and racial groups, all occupations and age groups, and it continues as a crisis for every member of the community. Studies based on the COVID-19 pandemic outbreak indicated that during the epide-

mic, different groups of people from the general public to health care workers had varying degrees of psychological problems such as fear, worry and depression.[8,9] University students are the most affected population who have suffered academic loss along with changes in their social life due to coronavirus pandemic.[10] Literature search shows that university students face a lot of stressors in life and are already prone to get depression, anxiety, insomnia and appetite changes to meet academic and social challenges of youth.[11]

Currently, the universal practice endorsed for minimizing the spread of coronavirus adopted globally is home quarantine.[12] Home quarantine and social isolation has created a great impact on human population. A study conducted to evaluate the quarantine-induced cardiovascular disease burden showed that increasing duration of mass-quarantine and self-quarantine leads to increased stress.[13] Similar study was conducted in Bangladesh to know about the impact of COVID-19 pandemic on the mental health of university students with the home quarantine duration of only 1 month, which depicted that depression, anxiety, stress and anger issues were on the rise corresponding to the rising time period of quarantine. 14 During this pandemic, most of the information sought about COVID-19 was based on the use of social media. Similar findings are supported by other studies which point out the same medium responsible for spread of information of this disease.[15]

During this research, DSM-V criteria was opted for the diagnosis of depression and other related psychological disorders. Results revealed that 49.8% of the students were suffering from depression and other related issues. This data is comparable with the study conducted among Chinese college students using the same screening scale.[16] The depression rate was found out to be 9.0% in university students, as it had been only 1 month of home quarantine of these students.[17] A study done in Malaysia depicted that the prevalence of depression among university students is 34%. [18]

Worldwide literature shows that this pandemic has affected mental health of general population as well as it has long lasting effects on psychosocial health of health care providers. A study conducted in Bangladesh reported that suicidal ideation is increasing because of the fear of death with COVID-19.[19] Similarly in India two cases have been reported of suicide and researcher has reported to encounter more

suicidal ideation in patients reported with psychiatric illnesses.[20] However in our study the percentage of students having suicidal thoughts was the least. (Figure 1)

In order to overcome this frustration, the youth has adopted certain coping strategies. Results of this study reveal that, at the top of the list is watching seasons and movies (60.8%) which is followed by spending quality time with family (58%). New Zealand university students have opted for more religious and spiritual indulgence as coping techniques during this pandemic.[21] A study conducted in nursing students, has shown that 43% of them suffered with moderate anxiety during COVID-19 pandemic and they used humor and strong resilience as coping strategies during this tenure. [22]

Results of this study have shown that 4.5% of the respondents have opted for smoking tobacco during this quarantine and 1.9% for use of narcotics or other kinds of drugs to release stress caused by home quarantine during COVID-19. Recently a study in China reported addiction with internet and increased substance abuse among students during COVID-19 pandemic.[23] The most affecting strategy reported in scientific data suggests physical exercise as a best coping mechanism to counteract anxiety and depression during home quarantine. [24]

Bivariate analysis of results showed that female gender is more affected in our sample of university students. Similar findings have been reported in Iranian medical students that mostly female medical students were affected. Their sleep pattern was affected and they were more concerned for their GPA during COVID-19 pandemic. [25]

Conclusion:

COVID-19 pandemic has created a lot of stress in all sets of life. University students have faced psychosocial changes during home quarantine. A large number of students suffer from depression and anxiety during quarantine. Female students are affected the most with this pandemic.

Authors Contribution:

UNC: Data collection

IM: Finalization of write up, analysis of results, supervision of the project.

ARR: Write up of results

UF: Write up of discussion, Tables and bar graph generation, Literature search

AM: Tool development Supervision of project

GHSK: Provision of DSM V& Help in tool development

Conflict of Interest: None

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Impact of COVID-19 Pandemic on Thoracic surgical Practices; Experience at a Tertiary Care Hospital

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Abstract

Indtroduction: COVID 19 Virus has spread worldwide very rapidly and World Health Organisation has declared it as pandemic on March 11.2020.COVID 19 Pandemic has widespread impact on surgical practices worldwide ranging from cancellation of elective surgeries due to shortage of human and technical resources, changes in surgical procedures, high risk of viral transmission both intra as well as postoperatively.

Study Design: Descriptive cross sectional study.

Place and Duration: This study was conducted at Thoracic surgery department of Services hospital Lahore and Surgimed hospital Lahore over a period of six months from February, 26th to August, 26th 2020.

Results: Total of 108 patients underwent thoracic surgical procedures during this period with age ranging from 11 to 83 years and a mean age of 39.17 ± 15.65 years. Out of all these patients 72(66.9%) were males while 36(33.1%) were females. Most commonly performed procedure was tube thoracostomy in 86(79.63%) patients followed byuni-portal VATS 15(13.89%), chest wall resection and reconstruction in 5(4.63%), open thoracotomy decortication in 1(0.93%) and emergency thoracotomy in 1(0.93%) patient. Overall complications occurred in 6 (5.55%) cases with 5 (4.63%) occurring in emergency settings and 1 (0.93%) in surgeries performed electively. Death occurred in 1(0.93%) patient who suffered post Covid-19 massive lung destruction.

Conclusion: Covid-19 pandemic has globally affected the surgical practices having adverse effects both on the patients as well as surgical staff.Aim of this study is to determine the impact of Covid-19 on thoracic surgery patients and its future implications related to patients as well as health care workers.

KeyWords: Covid-19, Pandemic,Thoracic Surgery

Introduction

Detection of large number of cases of atypical pneumonia in Hubei province of China led to discovery of a new strain of SARS COV-2 which was named as Coronavirus disease 19 (Covid-19). This was identified as RNA Virus which spread rapidly in almost all countries of the world and was declared as public health emergency of international concern (PHEIC) by the World Health Organization (WHO) on January 30, 2020,[1] and pandemic by WHO on march 11,2020.[2,3,4]This pandemic affected all sectors and sections of the society and health sector was no exception resulting in changes in surgical practices. Covid-19 had vast impact on overall surgical practices ranging from staff and workforce related issues to procedural prioritisation and intraoperative risk of viral transmission. The first confirmed Covid-19 case in Pakistan was confirmed on 26[th]February 2020[5] and since then there was a gradual increase in number of affected patients with peak occurring during months of May and June. Government of Pakistan announced state of lockdown and majority of hospital resources were directed towards availing masks and personal protective equipment (PPE), minimizing staff movements and suspension of all elective work. Pakistan is a developing country with developing health infrastructure and limited resources so as a result, outpatient clinics and elective surgeries were

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cancelled. These actions were important in order to free up the overall hospital bed capacity and to ensure protection of patients as well as health workers. So far Pakistan has reported about 290000 confirmed Covid-19 cases with 6000 people losing their lives. Our hospital was one of the major hospitals of Lahore actively fighting against this pandemic and lot of resources were redirected towards fight against this disease. Despite allthese difficulties and limited resources thoracic surgery department of Services hospital continued providing services to its patients both in emergency and in selectively elective situations taking all precautionary measures suggested by both WHO, NIH and local health ministry.Aim of this study is to determine the impact of Covid-19 on thoracic surgery practice and its future implications related to patients as well as health care workers.

Methods

This observational study was conducted at thoracic surgery department of services hospital Lahore over a period of six months from February, 26th to August, 26th 2020.All Patients requiring emergency thoracic surgical intervention and selective elective surgery cases carried out during this period were included in the study. Covid-19 Screening of all patients undergoing elective surgical procedure and where delay in surgery was possible was done preoperatively, whereas in emergency situation all patients were considered Covid-19 positive and surgery was done taking all precautionary measures in accordance with guidelines of WHO and NIH. However, post-operativeCovid-19 screening of all patients was done. Data of patients including their age, gender, procedure performed was noted. Analysis of data was done using descriptive statistics in SPSS version 22.0.

Results

Total of 108 patients underwent thoracic surgical procedures during this period with age ranging from 11 to 83 years and a mean age of 39.17 ± 15.65 years. Out of all these patients 72(66.9%) were males while 36(33.1%) were females. Most commonly performed procedure was tube thoracostomy in 86(79.63%) patients followed byuni-portal VATS 15(13.89%), chest wall resection and reconstruction in 5(4.63%), open thoracotomy and decortication in 1(0.93%) and emergency thoracotomy in 1(0.93%) patient for primary repair of right bronchial disruption. Out of 86 patients undergoing tube-thoracostomy 32(37.20%)

were of tension hydro-pneumothorax,followed by 19(22.09%) of tension pneumothorax, 11(12.79%) of pyopneumothorax and 24(27.91%) were of symptomatic malignant pleural effusion. Out of 24 patients suffering from malignant pleural effusion 17(70.83%)also underwent Talc pleurodesis, once the lung expansion was achieved. Out of 15 uniportal VATS procedures, 14 were of VATS debridement for multi loculated empyema thoracic and 1 was ofapical bullectomy for recurrent tension pneumothorax. (fig.1) Chest wall resection and reconstruction was done in 5 patients, out of which 4(80%) were post chemo chest wall sarcomas whose surgery cannot be delayed any further and 1(20%) patient was of symptomatic huge recurrent desmoids tumour. Overall complications occurred in 6 (5.55%) cases with 5 (4.63%) occurring in emergency settings and 1 (0.93%) in surgeries performed electively(fig.2).

Fig.1A. *Heart Shaped Giant Right Sided Bulla, B.*
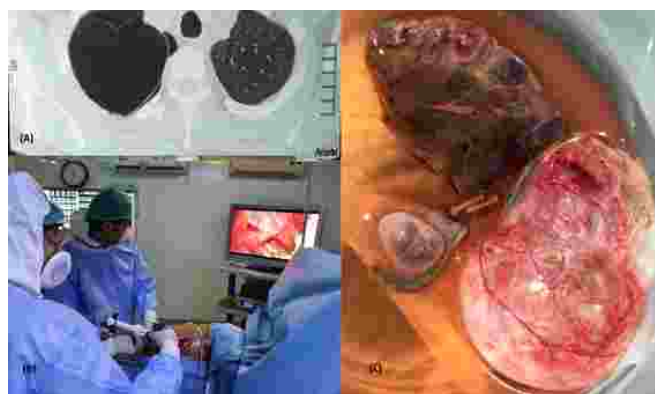
Uni-Portal VATS Bullectomy in Progress, C. Giant Bulla After Resection

Fig.2 Distribution of Different Procedures
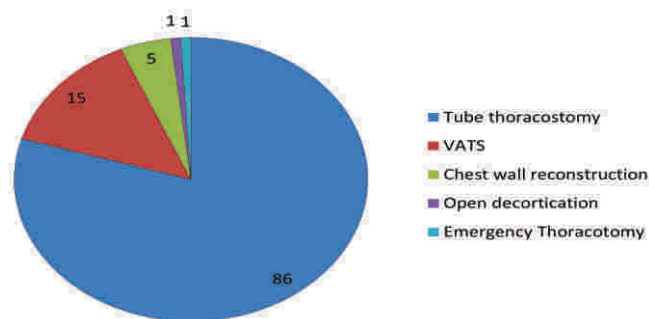
Performed.

Majority of the procedures 87(80.55%) were performed in emergency settings while 21(19.44%) procedures were carried out electively.Most common diagnosis out of 87 patients treated in emergency was Tension hydropneumothorax in 32(36.36%) cases followed by massive malignant pleural effusion in

24(27.27%) cases, Tension pneumothorax in 19(21.59%) cases, pyo-pneumothorax in 11(12.2%) and blunt trauma chest requiring emergency thoracotomy in 1(1.15%) case(fig.3,4).
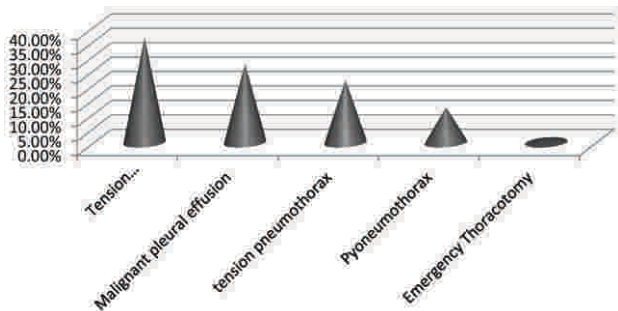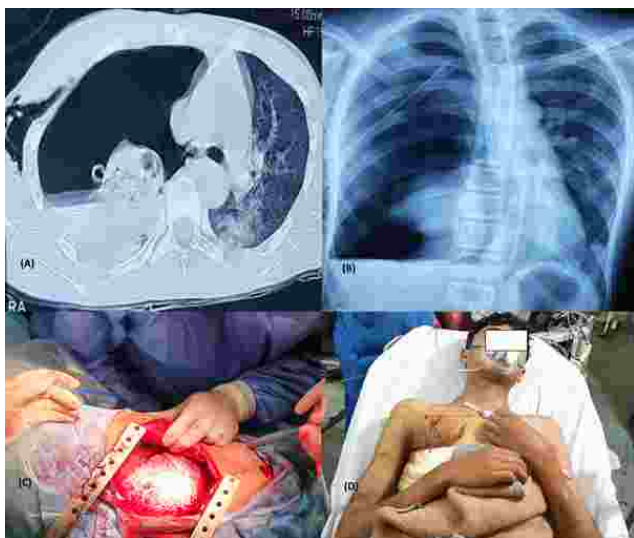

**Fig.3.** Diseases for which Emergency Procedures were Performed

Fig.4: A CT scan showing Right bronchial

transection just lateral to carina, B. X-ray chest of same patient showing Right collapsed lung with hemopneumothorax, C. On table goodexpansion of Right lung after bronchus repair, D. patient extubated on table with imprint sign on right chest wall.

21 patients for which elective surgeries were performed included chest wall tumours in 5(23.81%), uni-portal VATS in15(71.43%) andopen thoracotomy and decortication in 1(4.76%) patient (fig.5).

Fig.5 Diseases for which Elective Surgery was
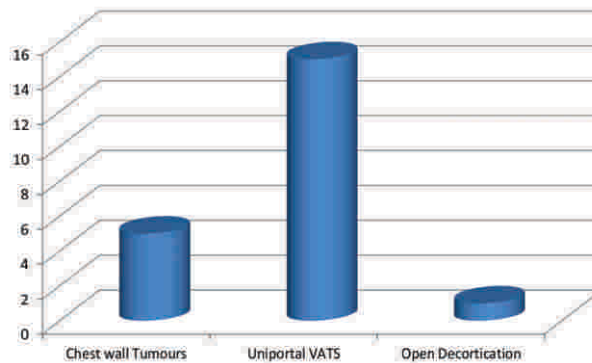
Performed

Death occurred in 1(0.62%) patient who suffered post covid-19 massive lung destruction.Of all patients undergoing surgical procedures 28(25.92%) turned out to be Covid-19 positive on screening. Despite taking all precautionary measures as suggested by WHO for surgery during Covid-19 pandemic both intra as well as postoperatively three of our healthcare staff members handling these patients became Covid-19 positive.

Discussion

Covid-19 has led to significant changes world-wide in surgical practice including reduction of the manpower, redirection of human as well as technical resources towards Covid-19 patient's, suspension of all nonurgent elective surgeries, reduced anaesthesia support and reduced bed availability for indoor patients. Still our department continued to provide all type of surgical care in emergency settings and fewer selective cases awaiting oncological surgeries where delay could have led to adverse effects on health of our patients were also entertained. Our policy was exactly in line with the guideline of NHS who recommended patients to be classified into priorities based on their clinical requirements.[6] The first surgical priority of healthcare systems is the handling of surgical emergencies, including major trauma[7] and in our study as well same principal was adhered to where 80.55% of patients were provided emergency thoracic surgical treatment. Our outdoor thoracic surgery clinics were closed like majority of the world. Spinelli[8] reported that most outpatient clinics were suspended in Italy. In The Lancet, The COVID Surge Collaborative[9]reported 30-days results of an international cohort study assessing postoperative outcomes in 1128 adults with COVID-19 who were undergoing a broad range of surgeries and reported a post operative mortality of 23.8% whereas in our

study mortality rate was 0.93%. In the same study Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections was diagnosed postoperatively in more than two-thirds of the patients whereas in our study 25.92% of patients were diagnosed as COVID-19 positive. In study by *Stahel*PF[10] it has been suggested that Some elective (e.g. cancer surgery) and most non-elective surgery must continue throughout any pandemic, and similar approach was adopted in our department and study. In our study three of our healthcare workers contracted COVID-19 Virus despite taking all precautionary measures such as utilisation of PPE for all procedures on patients with confirmed or suspected COVID-19 infection,[11]use of higher level of protection such as use of N-95 masks.[12]In a study conducted at Wuhan University Central South Hospital 29% of medical staff has contracted virus from the hospital.[13] Surgical personnel who were involved in conducting procedures involving aspiration of body fluids are at higher risk of getting infection from COVID-19 Virus.[14] Forrester et al has developed an algorithm for protection of surgical staff.[15] Various procedures which are believed to generate aerosol such as include: bronchoscopy, endotracheal intubation, tracheostomy procedures, cardiopulmonary resuscitation have been found to be high risk for transmission of COVID-19.[16,17] In order to reduce the risk of transmission, the CDC advises removal of non-essential personnel from the operating room especially during aerosol generating procedures.[18]*Dexter et al[19]* has suggested double gloving during induction of anaesthesia while *Kirk bailey et al* has recommended use of nasal Povidone iodine and oral chlorhexidine decolonisation.[20] Wong et al. has suggested wrapping of all 'high-touch' equipment such as monitors, nursing station and anaesthetic workstation in order to avoid repeated contamination.[21]It has been suggested that electrocautery should be used with lowest power settings and with a smoke evacuator in order to decrease exposure to surgical smoke.[22] Post-operative management of the patient should also be altered and special precautionary measures should be taken by the staff taking care of surgical patients which include careful handling of body fluids, disposal of gowns and PPE and waste disposal according to local infectious committee guidelines. There should be minimal movement of the staff and equipment in post-operative ward as well and staff involved in transfer and handling of suspected or confirmed Covid-19 patients should wear proper protective equipment. Patients with suspected or confirmed Covid-19 status needs careful monitoring in post-operative period as their recovery may be complicated.[23]Since there is also risk that front line health care workers especially in our part of the world who share family accommodations such as in flats or apartments can pass on the infection to other family members so they are advised to seal their clothes in a bag upon arriving at the hospital and should have a shower before putting them back on while going home.

Conclusion

COVID-19 pandemic has adversely affected the surgical practices both nationally and internationally having adverse effects on surgical patients in cancellation of majority of elective surgeries and putting health care workers at risk of acquiring COVID-19. Hence special protocol measures should be taken in order to avoid undue delay of surgical procedure along with keeping the safety of surgical staff as a priority measure as well.

Authors Contribution:

MSN. Overall, supervised the study

AA. Data collection, data analysis and write-up

SS. Data analysis and write-up

SM. Data collection and editing of manuscript

FAM. Supervised and technical support, and revision of manuscript

MSM. Evaluation of manuscript and revision of study and technical support

Conflict of Interest: None

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The Current Pandemic of Covid-19; Challenges for the Low-Income Countries and Possible Solutions

Amtul Musawar Sami[1], Malik Masood Ahmad[2]

Abstract

The pandemic of SARS-CoV-2, commonly known as Covid-19 has impacted all nations of the world. The impact of the Covid-19 pandemic can be far reaching, immediate impact including fear, illness and death. Early impact of the pandemic are the indirect health effects such as missed cancer diagnosis, delayed impacts include job losses and shrinking economies. A global task force is needed to play a pivotal role a continued approach of cooperative prevention. Systematic controlled measures are required by the whole world to save its future and halt the spread of the current pandemic.

Introduction

The pandemic of SARS-COV-2, commonly known as COVID-19 has impacted all nations of the world. The health care systems of all countries are stretched, and some reached the breaking point. In the low-income countries Covid-19 pandemic poses additional challenges. The most effective way to control the virus is social distancing, but an effective social distancing practices lead to huge economic costs, leading to poverty, distress, and disruption. These effects are felt even more acutely in the low-income countries. Easing of lock down and social distancing strategies have the potential to lead to a second wave of COVID-19, which could be potentially more lethal and economically more damaging. The main challenge is the highly infectious nature of the virus. It is shown that one infected person, without a lockdown, will pass it on to three others on average.

COVID-19 in Low-Income Countries

In the low-income countries, the population has a higher incidence of comorbidities such as high blood pressure, type 2 diabetes mellitus and obesity. It is feared that the impact of COVID-19 could be broader and more devastating in these countries. The health care systems in low-income countries are stretched as they are, and the additional workload and demand for resources, associated with the COVID-19 can comple-tely overwhelm the capacity of these countries to cope with the healthcare need of their nations. An additional concern is that for the paediatric popula-tion. It appears that the COVID-19 leads to a minor or asymptomatic infection in most children in high income countries, but the risk in low income countries is potentially high because of malnutrition and pre-existing lower respiratory infection diseases. In Sub-Saharan Africa, the presence of HIV is a parti-cular risk factor for a more virulent or even lethal COVID-19 infection. The scarcity of healthcare resources in these countries would lead to a diversion of vital healthcare resources. In the children of low-income countries, the challenge of increasing destitution is a real possibility because of disrupted schooling, lack of access to alternate education, interruption of vaccination and other healthcare programmes. In the low-income countries, the implementation of public health measures is a difficult challenge. Poor housing facilities may make social distancing impossible; lack of water may make hand-washing difficult and facilities for self-isolation may be non-existent because of overcrowding. An additional risk to the public health is the lack of avail-ability of personal protective equipment such as masks, gloves, and protective suits. This can compound the risk of nosocomial infection. The current pandemic is a

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harsh reminder of the healthcare challenges faced by the low-income countries.

Healthcare Burden of Low-Income Countries

The dramatic increase in the health needs of the world population, because of the burden of morbidity and mortality associated with the infection of the COVID-19 in populations with chronic diseases, has over-extended the health care systems. Over the last two decades, because of unprecedented connectivity of the world, the epidemic of the infectious diseases, including the severe acute respiratory syndrome virus (SARS), the H1N1 pandemic influenza, the Ebola-virus and the COVID-19 virus have rapidly spread across the world. It appears that the health, social and economic impacts of these epidemics are burdened by women in a much greater number than men. The socioeconomic crisis and mental stress experience by the public of the low-income countries is under-standable. Like elsewhere in the world, people in the low-income countries face unemployment, depri-vation, hunger, and social conflicts. The fragile health care system, lack of testing facilities and inadequate treatment availability exacerbates the anxiety amongst the public. These effects are compounded in the frontline workers such as doctors, healthcare staff, police forces, volunteer organizations at the frontline, and bankers. The devastating rate of spread of the COVID-19 an the duration of the pandemic is leading to serious consequences for patients, health care workers, health systems, and economies. Low-income countries lack the capacity, face shortage of crucial healthcare staff and resources to respond aggressively to the pandemic. It is a serious concern that all these factors may contribute towards a catastrophic loss of life. This is not all. Because of the COVID-19 pandemic, cancellation and postpone-ments of non-essential surgical services, emergency and essential surgical care has been affected because important human and material resources needed to be redeployed towards fighting the pandemic. This can lead to disease progression, and increasing morbidity and mortality, in addition to the COVID-19 death toll.

If African continent, counties that have the highest disease burden are South Africa, Egypt, Nigeria, Algeria, and Ghana, where the pandemic is negatively impacting on lives and livelihoods. The additional challenges in these countries to deal with the pandemic involve almost absent testing capacity and coherent reporting systems, that are compounded by the shortage of healthcare professionals. The standard measures of lock down and social isolation are potentially ineffective in countries with over-crowding of densely populated communities, limited access to food, water and sanitation. Because of these structural barriers, the spread of the COVID-19 in low-income countries is difficult to control. It is feared that the current pandemic can push millions of people in poverty. The additional challenges for the low-income countries are wide-spread prevalence of communicable diseases, rising healthcare disparities, regional conflicts, and public debt burden; all these create a vicious cycle of poverty, the spread of infectious confining many million people in the poverty trap. A clear strategic approach is required to gather the support and measures to large-scale testing, strong contact tracing, isolation and follow-up. In a low-income country, negotiating the tricky balance between arresting the spread of the current pandemic and enabling livelihood to continue to prevent extreme poverty and anguish is a huge challenge. The impact of the COVID-19 pandemic can be far reaching as shown in Figure 1.

A Solution Through a Global Task Force

The current pandemic, whilst is challenging for the whole world, is particularly serious for the low-income countries, requiring a concerted global effort to support already weak economies and poorly supported health care systems. A multi-sectorial task force is needed to oversee the global challenge of accurate risk assessment, strengthening healthcare capacity, and the management of the socioeconomic crisis of the COVID-19 outbreak. To support the efforts of low-income countries to fight the current pandemic, resources are required for the proper biomedical waste management to avoid the further spread of the virus. Mankind share a future, hence, to support the efforts of low-income countries to combat the current pandemic is a global responsibility and challenge. A concerted International leadership is required to support preparedness in low-income countries with resources, hospital equipment and technical exper-tise. Low-income countries need to engage as active partners in developing and supporting the research projects on drug and vaccine development. The international community needs to

develop better coordination, cooperation, and strong solidarity to fight the current pandemic and avoid stigmatization, so that the battle against the current pandemic can be won at a global scale. It is vital to empower the communities with accurate and easily accessible information on prevention, while supporting the quality training of health care personnel to treat the affected patients in a safe environment.

Conclusion

A global task force will play a pivotal role to ensure that the existing health system are strengthened and preserved to support the comprehensive care for populations worldwide. The legacy of a global effort could be an internationally strong healthcare set up to allow for future developments beyond the pandemic. A continued approach of cooperative prevention and control measures is required by the whole world to save its future and halt the spread of the current pandemic.
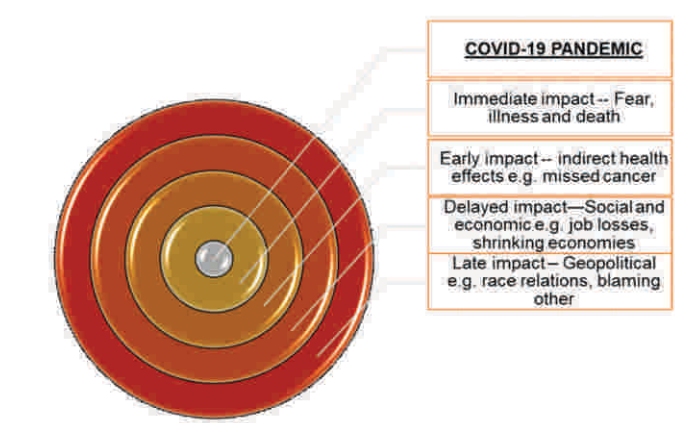

Figure 1. *Adapted from the Article by Jeremy Farrar "Our Response to COVID-19 will help Define the 21st Century*

Author's Contribution:

AMS: Concept data collection, analysis write up and approve.
MMAH: Concept data collection, analysis write up.

Conflict of Interest: None

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Guidelines For General Surgery During COVID Pandemic In Pakistan

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Introduction

The surgical workforce needs to be flexible and adapt to the evolving situation. Surge capacity models and contingency plans should be drafted and widely discussed during different phases of COVID-19 pandemic (see WHO Phases of Acceleration/ deceleration and preparedness) since first phase is already passed. The average duration of the second and third phases are 3 – 4 months based on picture observed in other countries of the world.

Being a low income country the facilities will never match high income countries. So need to device guidelines which are compatible and implementable in low resources.

Separate hospital/ makeshift buildings adjacent to Tertiary care hospitals need to be established in order not to bring the general public hospital capacity down as well as been able to function as a normal green zone after assessing all patients for their COVID status.

Facilities with negative pressure ORs should be identified and initially these guidelines should be implemented in these hospitals only – (may be declared as CORONA hospitals.

In the second stage of capacity building – all the large tertiary care hospitals with bed strength more than 1000 lacking negative pressure rooms and positive pressure ORs should be immediately upgraded on urgent basis. (example of upgradation of labs to biosafety level III)

Though priorities remain the same as published by the statement of Royal college of UK and Ireland. These priorities include:

i)   Maintain emergency surgery capabilities
ii) Protect and preserve the surgical workforce
iii) Fulfil alternate surgical roles
iv) Fulfil alternate non-surgical roles

Clinical Rota / Work Force Utilization

The surgical workforce needs to be merged in a common pool to reduce the exposure. Since as we will go deeper into the pandemic, workforce burn out, infection, quarantine, isolation, issues with families of health care providers will definitely worsen.

The number of surgeons exposed directly to the suspected as well as confirmed cases need to be kept to a minimum.

Emergency / casualty criteria need to be modified according to phase of pandemic. (algorithm 1)

All subspecialties should be involved in surgical rotation and initially inpatient / cold duties may be shared with general surgery residents and house officers.

All the subspecialty SPRs need to be involved for COVID Negative areas.

Involvement of undergraduate students and ill trained staff should be discouraged by all means.

Health care workers getting positive for COVID-19 should be dealt in a different pathway in order to be able to save them from spreading the disease as well as being prioritized for provision of ICU/Ventilators if required.

Teams from other hospitals/ regions may be asked to assist systematically in epi-centers and specialized dengue facilities e.g. PKLI

A team of dedicated surgeons may be deputed in PKLI with all the PPEs to deal with any surgical requirements.

ER Workforce

Only 2 – 3 doctors with sufficient expertise in clinical assessment and evaluation should be exposed per shift in ER. It is mandatory for these staff to observe complete PPE recommendations.

Each shift should not be more than 6 – 8 hours.

All patients which require Emergency operation/ admission would be sent to isolation ward and COVID test sent.

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ORs need to be developed into an COVID positive and a COVID negative areas.

In case of unavailability of kits or delay in test result – all the patients should be treated as per COVID positive case pathway.

All the rest of workforce should stay in respective wards for operative management / admission of emergent cases.

The department may be divided into two wards – one COVID positive and other COVID negative areas.

Any workforce getting the symptoms and getting positive may go into self-isolation.

An isolation ward needs to be designated only for health care workers getting sick during the pandemic. This can be the third surgical ward.

This plan will dramatically reduce the number of PPE's required, workforce directly exposed to suspected cases and reduce the frequency of ER duties.

Senior faculty starting from the ranks of AP'S to professors may divide the responsibilities of operating/ postoperative management and ER rounds in the beginning of the Pandemic.

Later on, the consultants may need to take up duties in ICU/ OTs for non-surgical responsibilities like the case in Italy, France and Spain.

All personnel exposed in ER should be sent home atleast for 2 weeks if possible. This is only possible with pooling of staff for general as well as subspecialty residency programs.

Elective Cases

Society endorses the guidelines published by American society of Surgeons, European society of endoscopic Surgery, SAGES and Royal colleges of UK & Ireland.

These guidelines are modified according to our own needs.

Issue of negative pressure operation theatre needs to be addressed. Since most of the old public hospital facilities do not have this facility, operations have to be stopped for COVID Positive cases only.

Other sites can use the guidelines to develop / alter one of their existing facilities into negative pressure OR suites/ ICUs

Figure 3 shows an example of negative pressure operation theatre/ ICU/ isolation rooms.

Management of Surgical Smoke and Elective theatre policy[1]

The risk of infection through surgical smoke is low since if

1.1. Negative pressure OR are used

1.2. Dedicated OR are used for COVID19 Positive cases

1.3. Laminar flow is turned on 20 min after the end of procedure since the viral load spreading after this time will be exceptionally low. (a list of available smoke evacuation system are attached for review.

Low energy oscillating devices may not destroy the viral protein structure and should be avoided.

To prevent spread of vapours in Surgical smoke

1.3.1. Pneumoperitoneum may be created using close technique trocar placement

1.3.2. The CO_2 pressure should be kept to a minimum

1.3.3. The gas should be aspirated through an extraction devise/ extra filters before removal of specimen/ extension of
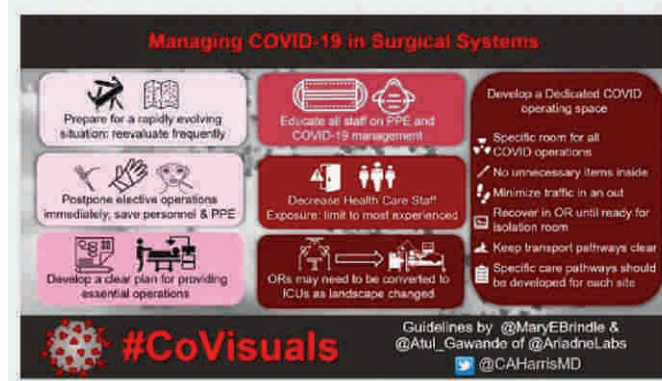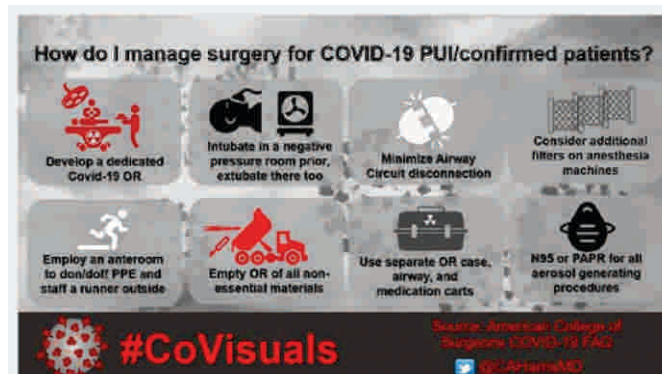
incision for retrieval of specimen.

It is unclear whether laparoscopic smoke represents a greater risk than that created during open surgery.

Society currently recommends use of any form of extraction devices to collect smoke in possible /

positive COVID cases.

Training According To Pandemic Needs

All the surgical staff should be asked to attend online training modules developed from videos and presentation available from different societies specially China.

To complete the online courses available through
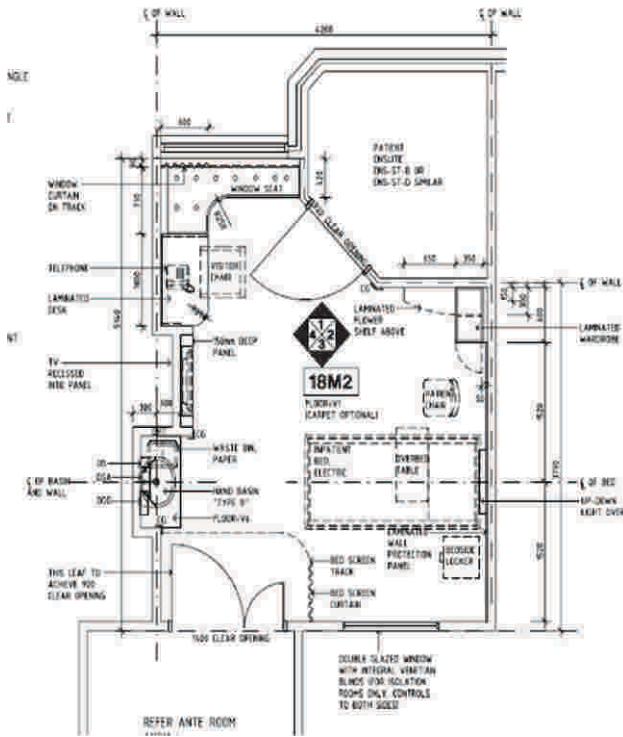
WHO webpage for all surgical team to standardize strategies to treat patients

Develop social whatsapp groups and assign different members of the team to develop protocols and pathways.

Quality assurance teams initially in terms of training and later in the form of implementation of the SOPs should be identified early.

A center command system should be nominated to co-ordinate with all the stakeholders including daily media briefings.

Triage Pathways

The patients presenting with general surgical conditions and follow-ups should be routed through special pathways. Their exposure to medical out-patient department should be minimized.

Specialized clinic away from the main OPD should be established.

Patients presenting with a surgical problem reaches the OPD block for registration and guidance.

Social distancing and cctv survellience of the waiting area should be made mandatory to ensure prevention of aerosol / droplet spread from suspected to normal patients.

All patients at the entry to the reception area must wear surgical mask, use hand sanitizer and pass through a bleach shower area

Table 1: *Summary of Commercially Available Smoke Evacuation Systems*

	CONMED	Cooper Surgical®	Ethicon	Medtronic	Olympus	Stryker	Northgate
Product name	AirSeal® (laparoscopic) PlumePen® (open) Buffalo Filter® Smoke Management	SeeClear Plume-away	Megadyne™ Mega Vac PLUS™ MegaVac™ MiniVac™	Valley Lab RapidVac™	UHI-4	Pneumoclear™ PureView™ Neptune™ (open) SafeAir™ (open) Photonblade™ (open) Smoke Evac Retractors™ (open)	Nebulae™ I system
Open	Yes	No	Yes	Yes	No	Yes	No
Laparoscopic	Yes	Yes	MegaVac PLUS™ only	Yes	Yes	Yes	Yes
ULPA	Yes	Yes	Yes	Yes	No	Yes	Yes
Micron filtration	0012	0-1	0-1	0-1-0-2	n.a.	0 051-01	0-12
Passive or active evacuation	Active	Passive	Active	Active	Active	Active	Active

Reproduced from a document published by the Society of Gastrointestinal and Endoscopic Surgeons in conjunction with their guidelines for surgeons concerning the use of laparoscopy during the current COVID-19 pandemic[2-35]. ULPA, ultralow particulate air; n.a., not available. CONMED, Utica, New York, USA; CoopcrSurgical®, Trumbull, C Connecticut, USA; Ethicon, Somerville, Ncwjcrscy, USA; Medtronic, Dublin, Ireland; Olympus, Shinjuku City, Tokyo, Japan; Stryker, Kalamazoo, Michigan, USA; Northgatc, Elgin, Illinois, USA.

Special cabins with protection need to be established using fans / exhaust to reverse flow the air current from the health care provider.

Special clinics e.g. Colorectal clinic, breast clinic, head and neck clinic, wound clinics should be established in different wards where consultants can safely examine the patients once they have been screened. This will reduce the risk of cross contamination as well .

Only one surgical and one medical unit per day with reduced staff to be present in the OPD to triage the patients. Telemedicine counters can also be put in place to do the same in the OPD. Patient can sit in the room in front of an IP cctv camera and discuss his or her problem with the triage officer/ medical officer sitting at a separate area and guided according to the needs.

Initially the emergency department can be used as the primary triage area. By setting up 5 - 10 telemedicine counters in front of the emergency department.

Operating On COVID Positive Patients

At the time of writing these guidelines, all the general surgical services have been scaled down to baseline. All elective cases being postponed until the phase 2 / 3 of the pandemic tidal wave is passed.

It is recommended not to operate on any case unless life threatening condition arises in an emergency situation e.g. major trauma.

All Malignancy cases, transplant surgeries as well as major operations have been postponed initially for 6 weeks – based on information learnt from the pandemic curve seen in other countries.

This will help guide the experts to identify to re-evaluate the situation and guide further.

The surgical decision preferably should be made by two senior consultants and atleast one senior consultant should be involved in the operation for complex emergency situation.
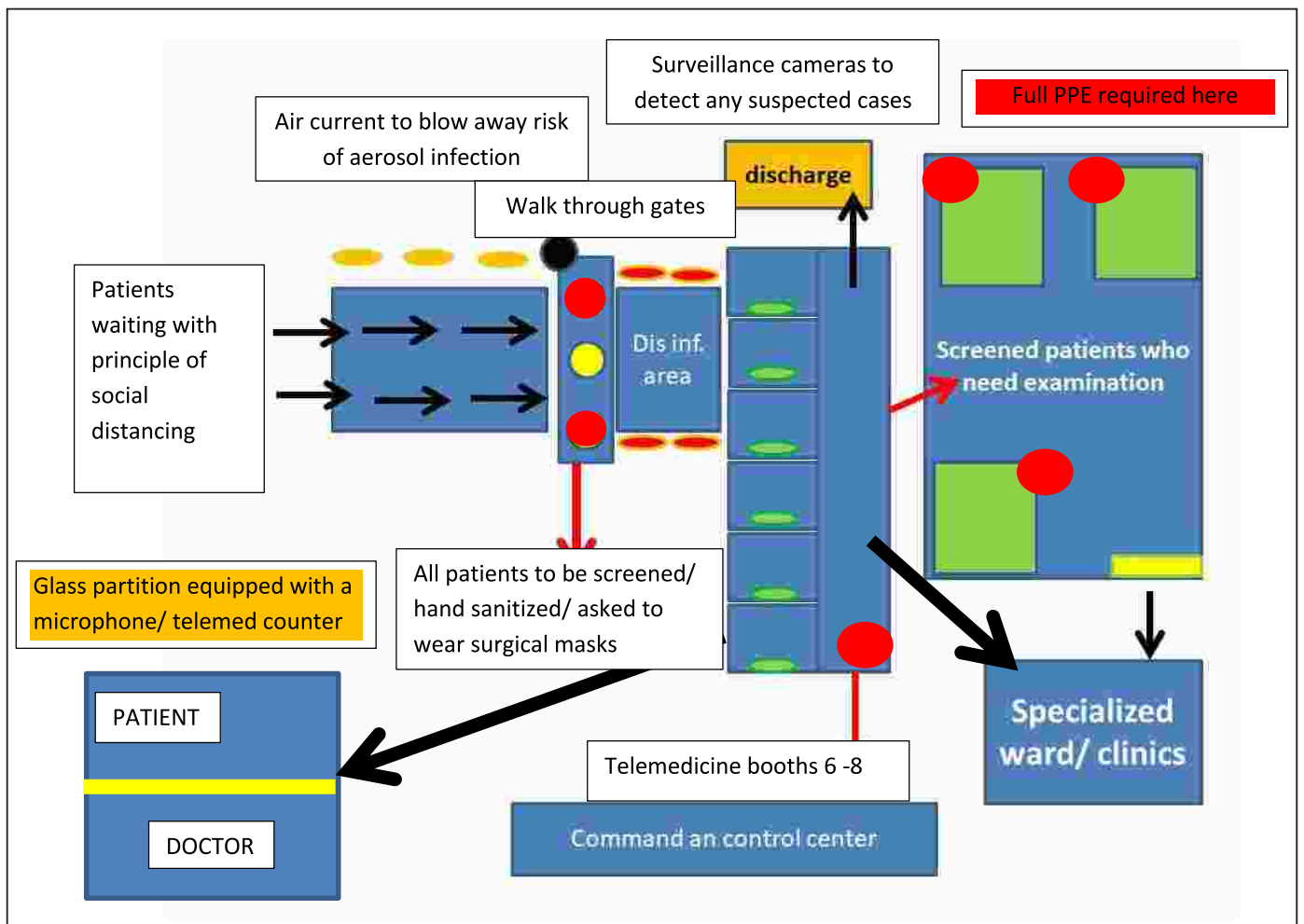
Use of laparoscopic surgery and high oscillating instruments need to be minimized.

Management of Surgical smoke

Summary

The guidelines may change as per behavior of the contagion curve as required.

Conflict of Interest: None

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Oral and Maxillofacial Surgery During the Prevention and Control Period of the COVID 19 Pandemic

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Abstract

Objective: To share the experience of management of patients during the corona virus pandemic.

Study Design: observational study

Place and Duration of Study: Oral and maxillofacial surgery Department King Edward medical university from 14th march to 14th April 2020.

Results: During this pandemic oral and maxillofacial surgery department continued its emergency procedures and critical cancer surgeries along with follow up of the patients. A total of 15 cancer cases, 30 trauma and 5 other pathology cases were operated. Moreover, follow up of 23 patients was done in one month of COVID 19 pandemic i. e from 14th march to 14th April 2020. However all protocol was followed by all the doctors , and paramedical staff and special attention was given to infection control and prevention. It is important to note that many patients reported with psychogenic pain, TMPDS, and atypical facial pain and contacted telemedicine.

Conclusion: The duty doctors of the department of oral and maxillofacial surgery are at high risk to the infection due to their close proximity to oral and nasal cavities. As one of the biggest hospital in the country, the department continued to serve its emergency cases along with oncology after taking all the necessary measures for COVID 19.

Keywords: Diagnosis; new coronavirus; protection

Introduction

On December 31, 2019, China reported a number of pneumonia cases of unknown etiology that was later known as severe acute respiratory syndrome coronavirus 2(SARS-CoV-2).[1,2] Patients with the disease, called coronavirus disease 2019 (Covid-19), usually present with fever, cough, and shortness of breath within 2 to 14 days after exposure. As of April 14, 2020, there had been 1,936,700 diagonosed cases of COVID-19 reported worldwide, 120,568 deaths had been reported. After noticing the widespread global transmission of COVID-19, the World Health Organi-zation announced COVID-19 to be a pandemic on March 11, 2020.The first two cases of Covid-19 in the Pakistan were confirmed on February 26, 2020.[3] And with time the number of patients began to increase with each passing day. It was announced by health department that out patient departments will be closed and all elective procedures will be postponed till the end of crisis. The treatment of emergency cases will be continued.

The professionals working in the Department of Oral and Maxillofacial Surgery are extremely exposed to the infection due to their major dealing with patients' oral and nasal cavities and secretions. As largest maxillofacial department in the Pakistan, at King Edward Medical University and Mayo Hospital, we receive patients from all over the country ranging from trauma to oncology. When this pandemic arose, many patients were already present in the ward waiting for their surgery. Meanwhile our hospital was announced as nominated hospital for the admission of corona patients. Another problem was our operation theatre was located near the wards where isolation of suspected patients was advised so surgical theatre was arranged away to reduce exposure.

On February 28, a meeting was held and all protocol

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was decided according to WHO protocol. It was decided that during this pandemic we should not ignore our critical oncology patients and emergency procedures. The standard operating protocols of patient care were designed.

1. Patient with Panfacial fracture or fractures compromising airway will be admitted or retained in ward and will be treated on priority basis.
2. Patients who have maxillary fractures in which occlusion is achieveable, only MMF will be done and will be recalled later on.
3. Patient with acute odontogenic infections, nectrotizing fascitis will be retained in ward.
4. Patients with post traumatic deformity, TMJ Ankylosis, benign Odontogenic tumors , vitally stable frontal bone fractures, NOE fractures and Zygomatic bone fractures will be recalled later on.
5. Vitally stable patients with frontal bone fracture, NOE fractures will not be admitted in the ward. (patients with acute emergency will be retained and managed after duty doctor assessment)
6. Patients of oncology will not be admitted in ward until unless needed(rapidly progression and airway compromise) after consultant recommendation.
7. Surgical extractions will be postponed.
8. Patients who have mandibular fractures and reported in emergency MMF will be done if occlusion is achieveable and non achieveable cases will be recalled later on.
9. Benign odontogenic tumors and lesions will be given registration numbers and recalled.

Methods

This study was conducted from 14th march to 14th April , 2020 after ethical approval. All patients who were operated/managed in the maxillofacial surgery department of king Edward medical university were included. During this time period 73 patients were managed. Patient's age, gender and disease such as pathology or trauma were considered. All data was entered in SPSS 24 version and t test was applied for statistical analysis.

Results

It was unique kind of scenario throughout the world so decision of doing emergency procedures and some malignancy cases was quite tough. But also keeping in mind our socioeconomic status, it was decided to limit the number of health care workers at department and continue serving poor patients whose surgery delay could lead to complications.

A duty roster consisting of senior consultants, junior consultants, senior and junior residents and medical officers was made under the supervision of professor. In the operation theatre, alternate duties were done by professor and associate professor along with assistant professor. All the emergency procedures along with tumor surgery were performed. A total of 15 cancer cases, 30 trauma and 5 other pathology cases were operated. Moreover, follow up of 23 patients was done in one month of COVID 19 pandemic i. e from 14th march to 14th April 2020.

During this period, all measures of infection control and prevention were performed for patients to health-care workers.

Number of COVID 19 cases in Pakistan
Number of patients managed in one month of COVID 19

Discussion

Coronavirus belong to a big group of RNA viruses that produce symptoms dry cough, common cold to more severe diseases as middle east respiratory syndrome and severe acute respiratory syndrome mainly affecting immunocompromised patients. Moreover it has been related to cardiac issues and inflammatory problems in children. This time a mutant strain of coronavirus was identified in Wuhan city in December 2019. Since the emergence of the 2019, it has rapidly spread to 213 countries across the globe. In Pakistan first two cases were identified on 26 February. Now the cases across Pakistan are
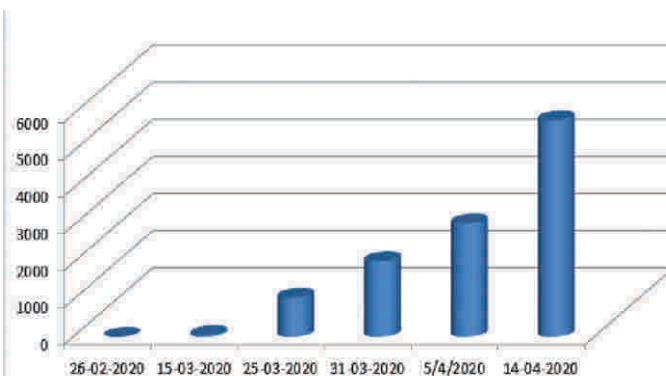
around 85000 and death has increased above 1500
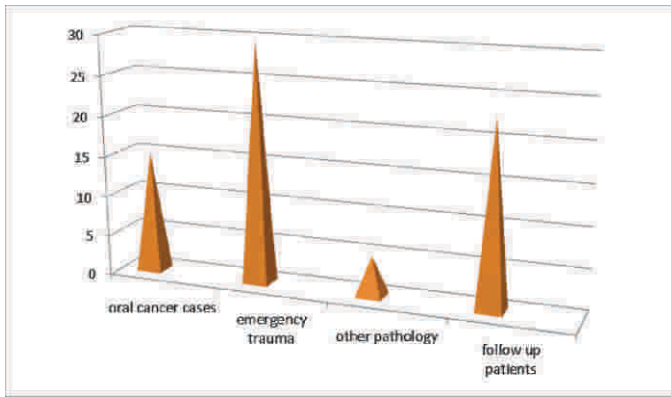
(The daily case report of coronavirus is available on official website link:http//covid.gov.pk)

The origin of SARS-COV-2 transmission still not clear as it is a novel disease and there is continues research going on. However, available data suggests that SARS-COV-2 is zoonotic pathogen with possible spread directly from infected people through infected secretions such as saliva and respiratory secretions. Sustained human to human transmission has been confirmed. So after closing OPD for the public, department held a meeting and made guidelines while following universal protocol. The procedures which are usually performed were divided in to two categories as urgent and elective. It was decided that all emergency procedures will be performed along with oncology. The patients with mandibular and maxillary fractures in whom the occlusion is achievable will be provided with MMF and will be followed up. The patients with acute odontogenic infection will be admitted in the ward and monitored accordingly. The patients with NOE fractures, frontal bone fractures and zygomatic bone fractures will be called later on.

For the ward infection and prevention policy was adopted such as

1. Early recognition of symptoms and control its spread.
2. Implementation of standard operating operations for all patients
3. Use of empiric additional precautions (droplet, contact and airborne precautions) for suspected patients.
4. Manage exposure to COVID 19.
5. Suspected patient to be kept in an area separated from patients who are tested negative.
6. Encourage the staff to have a high level of clinical suspicion
7. Correct and consistent use of PPE.
8. Ensure environmental cleaning
9. Perform recommended hand washing after contact with respiratory secretions
10. Place patient in adequately ventilated room
11. Use medical mask with eyes/facial protection
12. After using PPE, dispose it in a proper way and perform hand hygiene.
13. If equipment needed to be shared from one patient to another, cleaning and disinfecting with ethyl alcohol 70% is mandatory.
14. Refrain touching face and eyes with contaminated hands.
15. Avoid movement of patients unless emergency.
16. Reduce the number of health care workers and attendants.
17. Maintain record of all visitors and health care workers.

After ensuring all above things, patients were taken care in the department and numbers of surgeries were performed. The surgical therapeutic protocol adopted for maxillofacial trauma was that recommended by AO-CMF4

1. Consider closed reduction instead of open reduction and internal fixation for fracture management.
2. For making incisions in mucosa scalpel is preferred over monopolar cautery.
3. Bipolar cautery for hemostasis on lowest power setting
4. Reduce the amount of irrigation during drilling.
5. No repeated suctioning during procedures.
6. Rapidly progressing tumors and growths causing airway compromise will be considered for admission and surgery.

If we have covid-19 positive patients, all surgical procedures need to be performed in the negative pressure operating room.[5,6] However all of our patients were diagnosed negative, they were treated in non-negative pressure operating rooms. More focus was given to reduction of microbial flora by pre and postoperative use of mouthwash containing 1% hydrogen peroxide or 0.2% povidone because 2019-nCoV is sensitive to oxidation. In fact, it has been proven in some studies that povidone iodine is quite effective in reducing the number of microbial flora and aerosols produced during oral surgical procedures.[7,8,9,10] Moreover since our main operation theatre was near the corona ward so operation theatre was shifted in main surgical tower to avoid further exposure. Our main target was to ensure the protection of the patients as well as our staff.

With reduction in elective surgery, our manpower was utilized according to the needs of this critical time. Some of our doctors took care of the emergency procedures carried out and some were employed in the Telemedicine counter of the university where they took calls of the patients and gave guidelines regarding follow up and their conditions. It is important to note that many patients reported with psychogenic pain, TMPDS, and atypical facial pain and contacted telemedicine, proper counseling was done in these cases and medicines were prescribed.

Conclusion

The COVID-19 pandemic is worrisome as cases increasing at an alarming rate and for a longer period of time all precautions must be impleneted to stop and / or decelerate the spread of the infection. The staff working in the department of oral and maxillofacial surgery are highly endangered to the infection due to their higher level of exposure to patients, secretions of oral and nasal cavity. So Appropriate measures should be taken during surgical procedures, which includes N95/full face shield or PAPR. As one of the largest department in the country, we had this ethical duty to perform emergency procedures and oncology patients to serve the poor people of the country. We took all precautions and did our duty while keeping our health care workers safe.

Authors Contribution:

SH: concept, data analysis
NR: final proof reading
ZHK: Discussion writing
SRK: Initial drafting
AA: Writing and data analysis
ZAK: data analysis

Conflict of Interest: None

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