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Email: rmu.rrf.19@gmail.com

RJRMU

Resident Journal Of Rawalpindi Medical University

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Editorial

IMPORTANCE OF STEP-DOWN UNITS BUILT WITH PUBLIC AND NON-PROFITABLE PRIVATE SECTOR PARTNERSHIP

Noor ul Sabah Butt[1]

[1] Resident Pediatric Surgery, Rawalpindi Medical University

Cite this Article: *Butt, N. Importance of step-down units built with public and non-profitable private sector partnership*
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Step down unit is being introduced in tertiary care hospitals as an alternate to intensive care/high dependency unit for patients who are relatively less sick but not fit enough to be shifted to ward. Being a third world country, our tertiary care hospitals face a serious turmoil regarding patient turn over especially pediatric patients from different part of the country. Pediatric patients make about 1/3rd of the patients being managed in our setups.

With our intensive care units fully packed leading to the exhaustion of resources, the idea of step-down unit comes as a relatively cost effective and human resource friendly alternate. Step down units for a pediatric surgery facility as our setup holds an especially important place as these units specialize in dealing with post-operative patients not requiring intensive ventilatory support. Also worth mentioning is that the active resuscitation of pre-operative patients can be easily done in these setups if only one organ system is involved.

Not long ago in 1968, Gotsman and Schrire introduced the concept of step-down units for cardiac patients no longer needing invasive mechanical ventilation but were not stable enough for general ward. If we take the example of the model being followed in England by NHS, the categories range from 0 – 3, 0 being general ward, 3 being the intensive care unit. In this categorization level 2 is being designated as Step down unit.

These units operate as a dynamic unit having the capability of being a step-up place for patients needing more intensive monitoring and level of care such as those to be shifted from ward or emergency department. On the other hand, it serves as step down unit taking patients from intensive care before shifting them to general ward. What is more interesting is the fact it can ideally be used to laterally transfer patients from operation theater replacing the need of post anesthesia care unit if the patient does not need invasive ventilatory support.

A recent study based in Aga Khan University Medical Centre; Karachi emphasized on the importance of step-down unit built in 1994 in the management of preterm babies. They concluded that stepping down the very low birth weight infants from intensive care to step down unit with their mothers being the primary care givers reduced the mean length of hospital stay from 34 to 14days, and out of 509 cases, 397 (75%) were successfully discharged while there was no significant difference in readmission rates.

Another review of 98 patients who underwent pediatric supraglottoplasty over the span of 5 years in tertiary pediatric referral hospital by Diane W.Chen concluded that 85% of the patients were managed in Step down unit whilst only 4% of the reintubation and were stepped up to ICU without further delay.

As described earlier that it is a cost effective and human resource friendly model as it the step-down unit doesn't specifically need a designated separated area. These beds can be adjusted either with intensive care or general ward. And the nurse – patient ratio is 1:3 as compared to 1:1 in intensive care.

At the department of pediatric surgery, Holy Family Hospital, this unit model was followed using a public non profitable private partnership. This partnership was inspired by PPP(private public partnership) models being followed by different hospitals around the globe.

The Private finance initiative (PFI) in the United Kingdom follows Design, Build, Finance, Operate (DBFO) model which has been the primary means of financing major capital investments in the health, education and prison sectors during the past two decades.

Franchising is another PPP model followed in Sweden where either whole hospital or either one of the part of the hospitals are being managed by private contractors.

While another Al Zira model is a unique model in which a private institute is being held responsible for a definite set of population and in return for an annual per capita payment.

DIFFERENT PPP MODELS FOLLOWED AROUND THE GLOBE

Franchising	Public authority contracts a private company to manage existing hospital.
DBFO (design, build, finance, operate)	Private consortium designs facilities based on public authority's specified requirements, builds the facility, finances the capital cost and operates their facilities
BOO (build, own, operate)	Public authority purchases services for fixed period (say 30 years) after which ownership remains with private provider
BOLB (buy, own, lease back)	Private contractor builds hospital; facility is leased back and managed by public authority
BOOT (build, own, operate, transfer)	Public authority purchases services for fixed period after which ownership reverts to public authority
Alzira model	Private contractor builds and operates hospital, with contract to provide care for a defined population.

The main issues arising from this model system are

Cost:

These types of PPP model usually requires large sum of money to be paid to different constitutions of health.

Quality

Whereas they ensure that the project is finished in the given time and cost price, a compromise of quality was seen in different institutes.

Complexity

While these models are wildly accepted for transport-based industries, the hospital systems operate on much higher-level complexity in terms of management of referral patients as well as management of all kinds of sick and triaged patients. Also, worth mentioning is the involvement of affiliated universities and research funders.

Flexibility

The major problem with such setups is the lack of flexibility and large number of fine charges in case of any small change that was not forwarded before

the actual change makes it difficult for private firms to go on this partnership.

An example of PPP draw backs:

Paddington Health Campus, London, England

A private financing initiative approach was chosen as the mechanism to consolidate several world-class teaching hospitals on a single site in west London. In 2000 an Outline Business Case estimated a cost of £300 million with completion by 2006. When the scheme eventually collapsed the budget had risen to £894 million, with completion projected by 2013. Preparation of the failed project cost £15 million. The official report highlighted the extreme complexity of the project, unclear lines of accountability and a failure by central government to clarify whether it supported the scheme.

Another qualitative study based in Iran was conductive using purposive sampling having 9members from government sector and 9 members from private firm to study the effects of PPP models. This study narrowed down the different reforms for the success of such models to changes in policies and laws, socio-cultural changes, correction of current mechanisms and processes as well as financial and capital capacity building.

Keeping all this mind, a stepdown unit was established at the department of pediatric surgery holy family hospital, it was cost effective and was ready in 2 months, the infrastructure was revamped and was almost unrecognizable at the end of the project. The finances were provided by non-profitable private pediatric welfare organizations. The concerned party was in liaison with the administrators of the hospital. The administrators included the medical superintendent, additional medical superintendent, deputy medical superintendent of different departments were included. Multiple meetings were held with the private funders, private construction builders, and hospital administrators before the startup of the project. The hospital administrators provided a lot of help regarding logistics and early grant of access to the facility to make the possible changes as early as possible. The hospital administrators have also promised to follow the SDU protocols in terms of staffing.

The Step Down unit has brought about a pleasant change for pediatric surgical patients in terms of active resuscitation of the pre operatively for the preparation of surgery. The infectious disease protocols are easier to follow as compare to before when our patients were kept in neonatal ICU with other sick patients leading to poor prognosis and morbidity. This unit has not only provided a place to lateral shift the patients for post operative care after high risk surgery but also provides an alternate to ICU if non mechanical ventilation is required. The admission protocols are seriously followed and patients kept there are continuously monitored by state of the art monitors being provided by the hospital administration. The warmers and incubators avoid the potential cause of mortality in neonates that is Hypothermia. The patient influx is increasing and critical patients are being managed more efficiently and survival rate has increased by 38%. When in past these patients were mainly shifted to different tertiary care facilities.

Regarding the maintenance of the unit, follow up meetings have been done with private funders as well as the hospital administrators.

So far the model followed has shown promising results but the striking difference in our model is that the private non profitable organizations involved in the project are working on welfare basis.

Short Communication

IN SOLIDARITY AND CELEBRATION, GLOBAL PERSPECTIVE OF NEUROLOGICAL SURGERY IN COVID-19

Mudassar Abbas Siddiqui[1],Sara Hanif[2]

[1] *MBBS, Post Graduate Trainee Neurosurgery. UHS*
[2]*MBBS, Post Graduate Trainee DA. UHS.*

Author's Contribution
[1,2] Conception of study

Corresponding Author
Dr. Mudassar Abbas Siddiqui,
[1] MBBS, Post Graduate Trainee Neurosurgery. UHS
Email: Mudassar786abbas@gmail.com

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Corona virus disease 19 was declared Pandemic in March 2020. This lethal virus not only affected the advanced countries economically and socially but low middle income countries were badly affected. In lower middle income countries like Pakistan it was difficult to make prompt decisions for prevention from this Pandemic. Hospital setups were most affected as the number of cases turned up. Due to low resources it was very difficult to handle the situation. Neurosurgeons equally faced this tough time, it was hard for neurosurgeons to decide that how to pursue in these crises when the virus was hitting the world so badly. It was a challenge to continue the routine work. Most unfortunate were the young neurosurgical learners and Residents. Both the academics and hand on skills were affected more. As compared to the non-lower middle income countries we faced many problems, as lack of adequate personal protective equipment, limited machines and instruments and very little knowledge about the virus and its impact. This causes healthcare workers and neurosurgeons to fall prey for this deadly virus. Sadly some lost their precious lives as well. Advanced studies and researches enhanced the knowledge and things were streamlined a bit. But the major problem still exists, which is academics, hand on skills and pre op and post op patient selection and patient care. And still a debate/research is required that how to overcome this issue and how to reduce the viral transmission via person to person. So that we can get rid of the virulence and can carry on our work regularly till the treatment is aired globally. As compare to Higher Income Countries here in Low Middle income countries surgeons face financial, technological and social disparities. In already existing disparities COVID-19 added an insult to the injury for Neurosurgeons, Residents and Young learners in LMIC's. Here in our setup we faced increased patient load and decreased workforce and obviously more decreased in COVID-19 days.

Despite in lack of resources and lack of training in particular fields we tried to keep providing best neurosurgical care to the patients. We set a triage during these pandemic days. Routine trauma cases needing abrupt Neurosurgical care

and High Risk cases were put on priority. Patients admitted via Outdoor Patient Department were admitted and being called one day before Surgery as it is routine to admit the patient in public hospitals on the OPD day in normal days. COVID testing is being done in hospital under strict surveillance before Surgery. No such rule was followed in Emergency Cases. Slow growing diseases or patients with mild diseases were given directions to take care at home, And in case of emergency they could come to the hospital emergency department.

Still more modifications and protective measures are required to coup up with this pandemic without stopping the learning process for junior aspirants of neurosurgery and patient care in LMIC's.

Recommendations

In the view of above circumstances local Government should be engaged for best possible provision of the facilities, proper workshops should be conducted regarding E-Learning, webinars and Virtual Skill learning these days. Free, online, short courses should be conducted for young Neurosurgical learners to enhance medical education in LMIC's. Proper Neurosurgical triage standard should be established worldwide so that every patient can get benefit without stressing the faculty and hospital assets.

Conclusions

In LMIC's more resources are required as compare to the High Income countries. General education to the patients and proper follow up is required. E-Learning should be promoted for Young Neurosurgeons. More research is required for providing best treatment and learning facilities in Low Middle income Countries.

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Original Article

Severity of 1st And 2nd Wave of COVID-19 Pandemic in Islamabad, Pakistan

Hassan Mumtaz[1], Farrukh Zaman[2], Qazi Muhammad Waleed[3], Zarghoona Gul[4], Anam Sayyar[5], Kinza Amir[6], Aamir Ghazanfar[7], Shahzaib Ahmed[8], Muhammad Hamza Naeem[9], Syed Abdul Ahad[10]

[1,6]House physician KRL hospital, Islamabad
[2]Consultant diabetologist and endocrinologist, KRL hospital, Islamabad
[3]House physician Ayub Medical College, Abbottabad
[4]House physician, PIMS hospital, Islamabad
[5]House Physician, Mayo hospital, Lahore
[7]Vascular surgeon, KRL hospital, Islamabad
[8,9]House officer, King Edward Medical University, Lahore
[10]House officer, Dow Medical University, Karachi

Author's Contribution

[2,6,7]Conception of study
[3,4]Experimentation/Study conduction
[5]Analysis/Interpretation/Discussion
[1]Manuscript Writing
[8,9] Critical Review
[10]Facilitation and Material analysis

Corresponding Author

Dr. Hassan Mumtaz, House physician, KRL hospital, Islamabad
Email: hassanmumtaz.dr@gmail.com

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Abstract

Introduction: The WHO has classified the COVID-19 outbreak as the world's sixth public health emergency (PHEIC). The epidemiological curve's waves depict the pandemic's development. With this research, we aim at evaluating patients' first and second curve features of the COVID-19 pandemic.

Materials and Methods: Between March 2020 and February 2021, all SARS COV-2 infection patients admitted to KRL Hospital Islamabad were studied cross-sectionally.

Patient admissions from September 2019 to August 2020 were split into two equal parts (i.e. 3 months each), with patients hospitalised from March 2020 to February 2021 being separated into a second equal portion (6 months each). Between April and September 2020, 57027 PCR tests were carried out.

Results: In this study, COVID-19 PCR positivity rate was 2.1% which equal to national positivity rate. The linear line shows the increasing trend of negative PCR tests, however, the negative PCR tests results flashed in the month of June. Mean length of hospital stay during the first wave was 10.5 and 14.5 during the second wave.

Conclusion: COVID-19 cases presented differently in both first and second waves of COVID-19 pandemic. The comparison of case presentation and severity of disease may help the healthcare professionals and epidemiologists to evaluate the treatment and management methods. It may highlight the effectiveness of administrative aspects of controlling the pandemic.

Introduction

The acute respiratory tract coronavirus 2 (SARS-CoV-2) that causes Coronavirus-19 (COVID-19) has spread throughout the globe, presenting a significant health danger to people all over the world. Spring and late summer/autumn are the two main times when occurrences are recorded in many countries [1-3]. When COVID-19 broke out on January 30, 2020, the World Health Organization (WHO) proclaimed it to be the sixth global public health emergency (PHEIC). On March 11, 2020, the WHO designated it a pandemic. As of February 26, 2020, Pakistan's population was estimated at 204.65.3,4 million [5]. At that time, the first case of COVID-19 was discovered in Karachi. In response to the epidemic, the government implemented a number of stringent preventive measures, such as house arrest and a three-month period of heightened social networking, performance and hard labour. With the return of social life in the country, everything had returned to normal, free of the need to don a mask and ensure the safety of others. When the number of patients with COVID-19 started increasing in August, it remained high until April of the following year. As a result, the government has been obliged to reinstitute harsh measures to keep the population safe, such as closing facilities and buildings, parks, restaurants, and cultural and sporting events, as well as imposing curfews. Pakistan's HIV/AIDS case count has risen and fallen over the last several years, and it seems to be stabilising or perhaps decreasing somewhat while this piece is being written. Several months ago, experts anticipated that the second wave of COVID-19 would appear. As soon as the restrictions were eased during the summer, the second wave started in mid-September 2020 and continued until March 2021. Whereas in other nations the second wave is much superior than the first. There have been almost twice as many deaths as there had been in the previous wave, which shows that hospital medical services came in second to none [8].

Among Islamabad hospitalised patients, researchers examined the intensity and features of the two waves of illness.

Material and Methods

Between March 2020 and February 2021, all SARS COV-2 infection patients admitted to KRL Hospital Islamabad were studied cross-sectionally.

Patient admissions from September 2019 to August 2020 were split into two equal parts (i.e. 3 months each), with patients hospitalised from March 2020 to February 2021 being separated into a second equal portion (6 months each). Between April and September 2020, 57027 PCR tests were carried out.

The research included all patients with a diagnosis of SARS-COV-2 (Covid Pneumonia) who had been admitted to the hospital. SARS-COV-2 infection was suspected but not confirmed in the lab, therefore those patients were omitted from the research. A SARS-COV-2 infection was identified via RT-PCR testing on bronchial swabs (nasopharyngeal / oropharyngeal) collected from patients with the disease.

Data was analysed using IBM SPSS version 24 (Armonk, New York, USA). The numbers in the research were created using descriptive statistics (frequencies). The KRL Hospital Islamabad Ethical Review Board gave their approval to this research project.

Results

Figure 1 shows the month wise data of all COVID-19 PCR tests conducted and positivity rate for COVID-19 infection during the first wave. 57027 tests performed till 30th September 2020. COVID-19 PCR positivity rate was 2.1% which equal to national positivity rate. The linear line shows the increasing trend of negative PCR tests, however, the negative PCR tests results flashed in the month of June. The following figure also shows the bulk of negative tests relative to positive PCR test results.

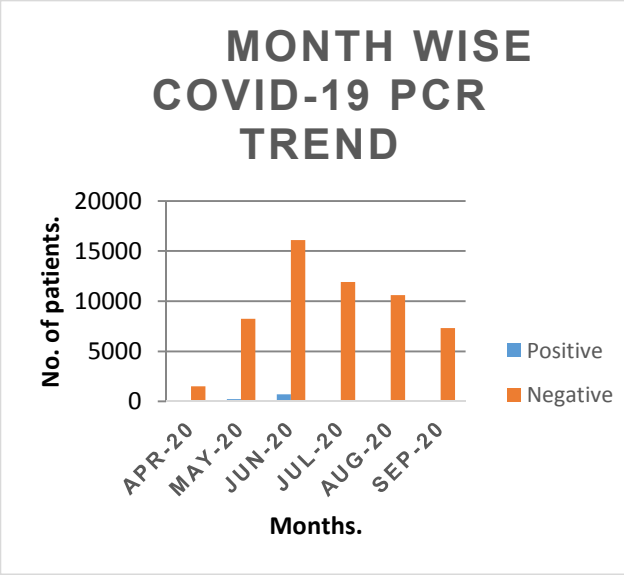

FIGURE 1 (1st wave): Month wise COVID-19 PCR Trend.

The severity of disease (COVID-19) was divided into the following four categories. 1. Asymptomatic; patients with positive PCR and zero symptoms were classified in this category. 2. Mild symptoms; patients having 100^0-102^0F fever, shortness of breath on exertion, body aches, maintaining >95% oxygen saturation at room air were grouped in this class. 3. Moderate symptoms; signs like high graded fever (101^0F – 103^0F), shortness of breath, myalgia's, oxygen saturation at 3-5 liters max with NIV nasal cannula were considered in this group. 4. Severe symptoms; symptoms like Fever (101^0F – 103^0F) shortness of breath, body aches, myalgia, prominent changes on imaging and difficulty in maintaining blood oxygen saturation with NIV nasal cannula (highly oxygen dependent) were indexed as severe symptoms. The results are explained in figure 2 and 3.

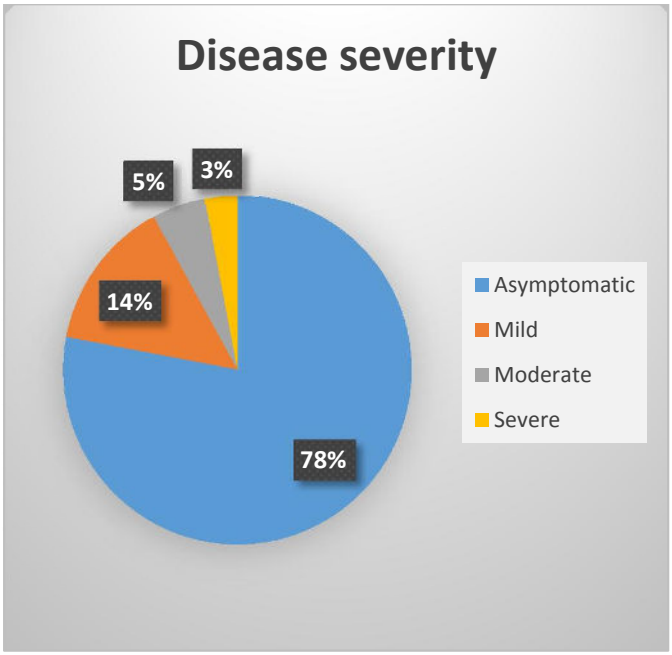

Figure 2 (1st wave): disease severity.

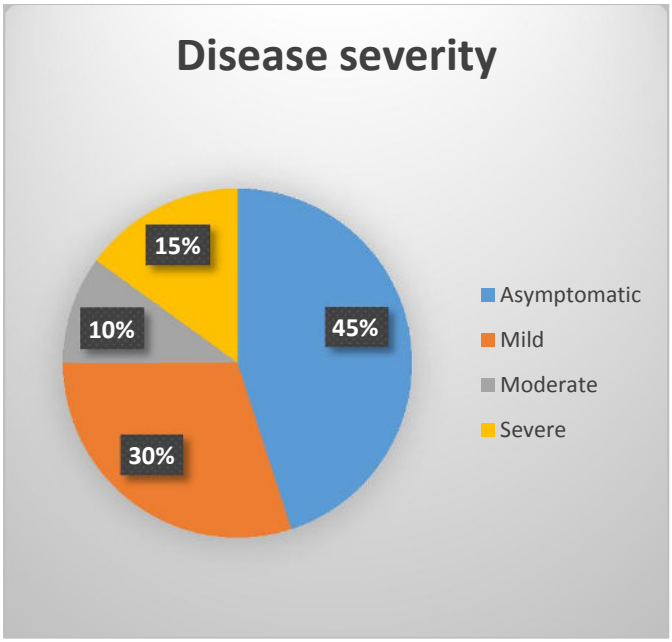

Figure 3 (2nd wave): disease severity

In the first wave, patients spent an average of 10.5 days in the hospital, with maximum and lowest stays of 17 and 4 days, respectively (mean). The second wave of patients had hospital stays ranging from 24 days to 5 days on average, with a range of 5 days to 24 days (mean).

Discussion

Pakistan is one of the most populous countries globally, which had about 0.9 million cases of COVID-19 until now [9]. The time span for the first wave ranged till August 2020, and that of the second was from September 2020 to February 2021, and both these waves had their peak for around about one month in which we reported the highest cases. It was observed that there was an inverted U wave pattern of seroprevalence of SARS CoV-2 infection; the same pattern was observed in another study [10]. One of the significant thing that came into account is the age of patients who were infected by the deadly and lethal virus, which was surprisingly younger people, children, and women, as also revealed by Fan G. et al [11] which may be due to poor compliance with social distancing and other Standard Operating Procedures (SOPs) may have resulted in spreading of the pandemic in younger patients. This may be due to some myths that the virus can only infect the elderly, which is a foolish thing to say, but these young people can also infect their own elderly, and when they do, the prudent time will be gone.

The high incidence of seropositive COVID-19 in younger patients resulted in depression in the case fatality rate, as shown by Iftimie S et al. [12]. There were many reasons for decreased case fatality rate, which includes firstly, the younger the patients, the better would be the immunity; secondly, now we had better understandings, perceptions, and comprehension of pathophysiology of plague, thirdly, Dexamethasone was used frequently because of the results published by Horby PW et al. [13], and Remdisivir was also proved to be a benchmark in preventing death and mitigating the hospital stay of the patient, which other researchers also witnessed [14] and last but not least the Planned and organized effort of Government in implementing the smart lock-down policy was worth it. However, the treatment plan of COVID-19 patients was changed in the second wave, so it was impossible to compare the effectiveness of the management plan.

Although we had a high proportion of patients having moderate and severe symptoms in the second wave as compared to the first wave, which is contrary to other studies [15-16-17], the recovery rate wasn't changed despite the higher number of severe seropositive COVID-19 patients, which is mainly due to reasons mentioned above. At the same time, hospital stay remained consistent in both of the waves.

As Pakistan conducted lesser Real-Time Polymerase Chain Reaction (RT-PCR) tests than other major countries of the world, it would be useless to compare the number of the confirmed cases of SARS CoV with that of foreign countries. However, considering the number of deaths in western countries is much more than in Pakistan, albeit the exact reason is not known, genetic makeup could also be the reason for significantly fewer deaths [18].

This study has some limitations, including a small sample size and uni-centric research, due to which we couldn't apprehend the bigger picture. And due to limited resources and restricted contact tracing measures, we can only locate the tip of the iceberg, but the real problem which should be addressed wasn't in our hands. The cases of re-infection couldn't be examined in detail because of the lack of facilities that depict viral genome, and the determinants of infectivity in first and second waves couldn't be studied in detail. And as we know, there was a whole different set of medications in treatment for COVID-19 patients in both waves, so that will be unfruitful to compare the effectiveness of medicines.

In summary, we had a slightly higher seroprevalence of COVID-19 in the second wave; it was more common in younger patients. At the same time, the hospital admission tenure in both of the waves was the same. There were more severe and moderate category cases, but now, the mortality rate hasn't changed because of having a better approach towards this ailment. Pre-existing comorbidities in the second

wave were the same as that of the first one. Developing countries like Pakistan cannot afford different waves of COVID-19 because our healthcare is always working on its total efficiency; any more addition will result in the collapse of the system. Our only way out from this is to vaccinate the mob as much as possible so that the level of herd immunity can be achieved. Being healthcare professionals, our moral and ethical obligation is to spread awareness about the disease and the vaccine. And we also have to break myths which is one of the biggest obstacles in not getting the jab.

Conclusion

Covid-19 pandemic struck the world extremely hard in terms of world wide spread and mortality. The pattern of COVID-19 spread and severity varied during first and second waves of the pandemic. The account of the changes in the behavior of the waves of the pandemic is crucial for the evaluation of the preparedness for the pandemic. The evolution of the pandemic can be halted by active surveillance and adequate measures to bring the epidemiologic curve to the baseline.

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Original Article

FACTORS ASSOCIATED WITH COVID-19 VACCINE HESITANCY IN GENERAL POPULATION OF RAWALPINDI/ISLAMABAD: A CROSS-SECTIONAL STUDY

Mushayada Irshad[1], Amber Rashid[2], Akbar Waheed Syed[3], Tahira Sadiq[4], M. Waseem Shahid[5], Hadiya Farooq[6]

[1]*Pharmacology department, Islamic International Medical College, Rawalpindi*
[2]*Pharmacology department, Islamic International Medical College, Rawalpindi*
[3]*Head of Pharmacology department, Islamic international medical college, Rawalpindi*
[4]*Community medicine department, Islamic international medical college, Rawalpindi*
[5]*Dermatology department, Military Hospital, Rawalpindi*
[6]*MBBS, Regular Medical Practitioner*

Author's Contribution

[1,2,6] Conception of study
[1,2,5] Experimentation/Study conduction
[3] Analysis/Interpretation/Discussion
[1,2,4] Manuscript Writing
Critical Review
[5,6] Facilitation and Material analysis

Corresponding Author

Mushayda Irshad
MBBS, Resident Mphil, Islamic international Medical College, Rawalpindi
Email: mishy2360@gmail.com

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Abstract

Introduction: A lot of controversies have been circulating regarding the COVID-19 vaccine. This has led to an increased hesitancy regarding the vaccine among the general population. This study aimed to evaluate the responses of the general population regarding different factors associated with the COVID-19 vaccine hesitancy.

Materials & Methods: A validated pretested questionnaire was used. Individuals having education till intermediate and who were not vaccinated against Covid-19 were included in the study. Individuals fulfilling the above criteria who were visiting the government hospitals of Rawalpindi and Islamabad were invited to participate in the study.

Results: A total of 185 individuals participated in the study. There were 106 (57.3%) males and 79 females (42.7%). The majority of the participants (n = 104, 56.2%) did not believe that the COVID-19 vaccine was effective, believed (n = 103, 55.7%) in the conspiracy theories on social media, did not trust the vaccine quality in Pakistan (n = 147, 79.5%) and thought that COVID-19 was not even a real disease (n = 178, 96.2%). A significant majority (n = 179, 98.6%) also reported not to have adequate information regarding the role vaccine has in preventing the spread of the disease.

Conclusion: Lack of knowledge and awareness regarding COVID-19 and its vaccine has led to high levels of hesitancy among people. The government needs to run educational and awareness campaigns to inform people regarding the disease and the role of the vaccine in its prevention. Strict legislative measures also need to be implemented to ensure better results.

Key words: *COVID-19, Pandemic, Vaccine hesitancy*

Introduction

The outbreak of of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has exceeded many early predictions and has created an evolving global public health and economic crisis.[1] This pandemic has spread to 220 countries and territories infecting over 188 million people and killed over 4 million individuals as of July 2021.[2] Moreover, it has exhausted the healthcare system and negatively impacted the social and psychological well-being of millions of individuals around the globe.[3] As we face the most catastrophic pandemic of this century, we must realize that many more serious illnesses and avoidable deaths are likely from the repercussions of Coronavirus Disease 2019.[4] In order to the curb the spread of this highly contagious virus in the absence of any effective therapy or vaccine, the governments around the world resorted to extreme social distancing and quarantine measures, specially to protect the people at high risk.[5] As a consequence, large economical disruptions have been created globally. The global cumulative output loss from the pandemic crisis are expected to be around nine trillion US dollars for the year 2020 and 2021.[6]

The presence of vaccines is the key element to control the spread of infections. However, vaccine hesitancy, which makes people delay accepting the vaccination or refuse it completely despite its availability, remains a barrier to full population inoculation against the highly infectious disease.[7] Ever since the initiation of the concept of vaccination, a significant part of the population has been reluctant to get vaccinated. Research conducted in the US during the COVID-19 pandemic to determine the willingness of public to get vaccinated revealed a general decline in acceptance of a potential vaccine and increased vaccine hesitancy.[8] Another survey revealed that a greater hesitancy in getting vaccinated is reported among those with lower education, unemployed individuals, younger populations, and certain ethnic and racial minority groups.[9] Similarly, studies across Europe also revealed hesitancy among a large proportion of the population to get vaccinated initially.[10] However, majority of the adults in Britian have now received or are willing to receive the vaccine. Surveys across UK have indicated that people from some ethnic minorities (Blacks, Pakistani and Bangladeshi) exhibit greater vaccine hesitancy.[11]

Till mid-September 2021, 42.6% of world population has received at least one dose of the vaccine. 5.82 billion doses have been administered worldwide and 29.5% are being administered each day.[12] Only 1.9% population of low-income countries have received one dose of the vaccine. Canada has around 70% and United Kingdom has around 68% of their population vaccinated with US, France, Italy and Germany close behind at over 50%. The Asian continent has received a total of 2.17 billion doses of vaccines, the highest vaccination rate achieved in China (1.39 billion, over 40%) and India (381.47 million, 22%). Unfortunately, Pakistan has only been able to administer vaccine in around 5% of the population so far (19.88 million).[12]

Success of immunization programs calls for high rate of vaccine acceptance and coverage. Therefore, just the availability of safe and effective vaccines is not enough, they also have to be accepted by the community at large in order to confer population benefit.[8] According to WHO, there are various factors that may influence an individual's willingness to get vaccinated; confidence, complacency and convenience. Confidence denotes the individuals perception of not being able to trust the vaccine (safety, efficacy) or the vaccine provider(competence of healthcare systems), complacency denotes the people's perception of vaccines deemed unnecessary, not understanding the risks associated with the disease and convenience involves the availability, affordability and delivery of the vaccines to the individuals in a comfortable environment.[13]

Research has shown that vaccine attributes, political factors and individual attitudes and characteristics contribute to greater hindrance in immunization programs.[8] Surveys reveal that people are generally

unsure about the effectiveness of the vaccine and are concerned about its safety and adverse effects.[14] Many myths and conspiracy theories have sprouted in Pakistan regarding the COVID-19 vaccine. One such conspiracy theory has been raised by two well-known politicians in Pakistan claiming the pandemic to be a grand illusion and a conspiracy against Muslim countries. This theory, widely discussed in the local community is one of the leading factors to vaccine hesitancy in certain groups throughout Pakistan.[15] Moreover, many individuals have been reported to prefer natural immunity over getting vaccinated. Misinformation about vital oils, colloidal silver, consumption of zinc, ginger, some Indian spices and other myths about how to treat and defend against COVID–19 without any scientific basis continue to circulate across web-based media.[16]

Such myths and conspiracy theories have continued to captivate many individuals' minds on vaccination throughout Pakistan. Therefore, vaccine hesitancy remains a significant challenge. This is one of the reasons that our country has not been able to eradicate polio yet; Pakistan is still one of the two remaining countries in the world where poliomyelitis is still categorized as an endemic infectious disease. Some of the factors that hindered the countrys anti-polio drive were reports of low vaccine consistency, concerns regarding dosing, religious bans and speculations about the presence of an active virus in the vaccine.[14] It is imperative to make the public understand the importance of vaccination and encourage acceptance, this can be achieved by focusing on the factors deterring people from the vaccine and addressing their misconceptions and fears regarding it. The aim of the present study was to determine the common factors that dissuade the public from getting vaccinated in Pakistan.

Materials and Methods

This cross-sectional multicentre descriptive study was conducted in three months duration from April to June 2021. Data was collected from 5 major government hospitals of Rawalpindi and Islamabad. General population visiting to these hospitals as patient or attendant was targeted. The WHO sample size calculator was used to calculate the sample size. COVID-19 hesitancy rates from the table 3 of the study by Sallam et al was used for the sample size calculation.[7] With a significance level of 5% and 90% power, a test value of the population proportion of 71.8% and an anticipated value of the population proportion of 58.5% found a sample of 134 to be adequate. Convenience sampling technique was used. Individuals having education till intermediate and who were not vaccinated against Covid-19 were included in the study. Those who were below the age of 19 years were excluded. A structured, pre-validated questionnaire[17] was used to collect face to face data. The questionnaire consists of two sections, first demographic details and second included ten questions regarding the hesitancy to get the COVID-19 vaccine. After validation by 3 experts, pilot testing was done. Ethical approval was taken from the ethical review committee (Riphah/IRC/21/37) of Islamic International Medical College. After taking verbal permission from concerned departments, the questionnaire was distributed. Data was collected by researchers themselves in various hospitals of Rawalpindi and Islamabad i.e Railway general hospital, Benazir Bhutto hospital, Holy Family hospital, PIMS and polyclinic hospital. The data was analyzed using SPSS version 26.0. Frequencies and percentages were calculated for categorical variables including education, age groups, gender and responses for different questions. Difference in responses between male and female participants was compared by applying chi-squared test. A p value of 0.05 or less was considered to be significant.

Results

A total of 185 participated in the study. Out of these 185, there were 106 males and 79 females. About two-thirds of the sample was in the age bracket of 20-40 years, with 86 (46.5%) participants being between 20-30 years old and 51 (27.6%) between 31-40 years of age. Most of the participants had at least

completed their matriculation (n=129, 69.8%). The demographic details are shown in table I.

Table I Demographics

Demographic Variable		Frequency (%)
Age Groups (Years)	20-30	86 (46.5%)
	31-40	51 (27.5%)
	41-50	28 (15.1%)
	51-60	17 (9.2%)
	60+	3 (1.6%)
Gender	Male	106 (57.3%)
	Female	79 (42.7%)
Qualification	Primary	34 (18.4%)
	Middle	22 (11.9%)
	Matric	51 (27.6%)
	Intermediate	78 (42.2%)

The response frequencies of different questions regarding COVID-19 vaccine hesitancy have been shown in table II. The responses for both male and female participants have been illustrated. As seen, a greater proportion of females believed that the vaccine is effective against the virus ($p < 0.001$). Also, a significantly greater number of females believed the vaccine would have side effects that would negatively impact their health ($p = 0.035$. Other than that, there were no major differences in the views of male and female participants.

Table III Frequency of COVID 19 Hesitancy Reponses per Gender (n = 185)

		Male	Female	Total	P Value
Do you think the vaccine will be effective against covid-19?	Yes	35 (33%)	46 (58.2%)	81 (43.8%)	***0.001***
	No	71 (67%)	33 (41.8%)	104 (56.2%)	
Do you think it will be difficult for you to take out time for vaccination?	Yes	30 (28.3%)	30 (38%)	60 (32.4%)	0.164
	No	76 (71.6%)	49 (62%)	125 (67.6%)	
Do you think healthy people and those who have recovered from covid require vaccine?	Yes	56 (52.8%)	47 (59.5%)	103 (55.7%)	0.367
	No	50 (47.2%)	32 (40.5%)	82 (44.3%)	
Do you believe in various conspiracy theories circulating on social media regarding vaccination?	Yes	55 (51.9%)	48 (60.8%)	103 (55.7%)	0.229
	No	51 (48.1%)	31 (39.2%)	82 (44.3%)	
Do you think the vaccine will have side effects/allergies which may affect your health?	Yes	14 (13.2%)	20 (25.3%)	34 (18.4%)	***0.035***
	No	92 (86.8%)	59 (74.7%)	151 (81.6%)	
Do you think vaccines will not be available easily at vaccination centers?	Yes	2 (1.9%)	0 (0%)	2 (1.1%)	0.508
	No	104 (98.1%)	79 (100%)	183 (98.9%)	
Do you have enough information regarding role of vaccine to prevent spread of covid-19?	Yes	0 (0%)	6 (7.6%)	6 (3.2%)	***0.005***
	No	106 (100%)	73 (92.4%)	179 (96.8%)	
Do you trust quality of vaccine being	Yes	23 (21.7%)	15 (19%)	38 (20.5%)	0.652
	N	83	64	147	

provided in Pakistan?	o	(78.3 %)	(81%)	(79.5 %)	
Do you believe that covid is NOT a real disease?	Yes	6 (5.7%)	1 (1.3%)	7 (3.8%)	0.242
	No	100 (94.3 %)	78 (98.7 %)	178 (96.2 %)	
Do you think going to a crowded vaccination center will make you ill?	Yes	29 (27.4 %)	13 (16.5 %)	42 (22.7 %)	0.08
	No	77 (72.6 %)	66 (83.5 %)	143 (77.3 %)	

Discussion

Although vaccination has been reported to have high efficacy rates against microbial infectious diseases, people still hesitate to get vaccinated. The hesitance towards vaccination sprouts from multiple controversies.[18] In the modern age, these controversies are even more exaggerated due to the impact of social media. The current pandemic has been accompanied by a lot of fear, psychological impact, and uncertainty. [14]

The present study aimed to assess the perceptions of the general population in Islamabad and Rawalpindi regarding hesitance towards the COVID-19 vaccine. Interestingly, most of the participants (n = 104, 56.2%) did not believe that the vaccine is effective. A study by Sallam et al. in Jordan reported around 25% vaccine acceptance. [7]In our study, a greater proportion of males (n = 71, 67%) denied the efficacy of the vaccine as compared to females (n = 33, 41.8%). Similarly, a study in Australia regarding vaccine hesitancy reported that females (n = 614, 83%) were more likely to agree with the statement that getting vaccinated is a good way of protecting them from infection. [19] This is in contrast to most findings globally; males have been reported to be more accepting of the vaccine owing to the of increased risk of COVID-19 associated mortality.[20] Moreover a study conducted in France regarding COVID vaccine hesitancy reported a strong association (p<0.001) between female gender and outright refusal of vaccine.[21] In our study, the majority of the participants (n = 125, 67.6%) thought that taking out time to get vaccinated is not a problem for them.

Surprisingly, a significant proportion of the participants also believed that they do require the vaccine (n = 103, 55.7%). Since this question was not further explored, it is quite possible that the participants may have been considering the vaccine requirement for travelling or other administrative purposes.

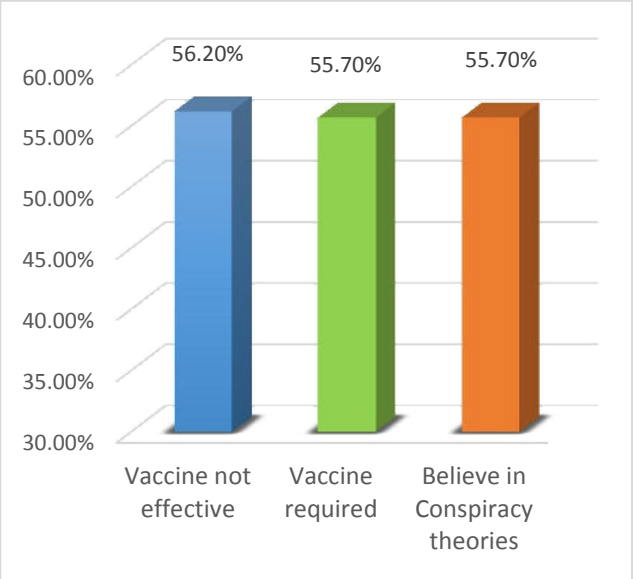

Figure. I Proportions of most significant Item Responses

Most of the participants (n = 103, 55.7%) also believed in the conspiracies circulating in the media regarding the COVID-19 vaccine. In contrast to our findings, Abbas et al. reported that majority of the people in their study did not believe in the conspiracies regarding COVID vaccine.[14] A study by Sallam et al. reported that females are more likely to believe conspiracy theories as compared to males (p<0.001).[7]

Another interesting finding of our study was that the majority (n = 151, 81.6%) of the participants did not believe that the vaccine would have significant adverse effects. A greater number of males (n = 92, 86.8%), as compared to female (n = 59, 74.7%) thought that the vaccine will not have significant adverse effects. These results imply that adverse effects of the vaccine were not a major concern for the participants. However, in contrast to our findings, a study by Abbas et al. in Sindh pointed out that a significant number of people (n= 464, 59.9%) were doubtful of the safety of the vaccines considering its quick preparation.[14]

Almost all of the participants (n = 179, 98.6%) were confident that the vaccines have been made widely available and are accessible to the general population. However, they (n = 147, 79.5%) did not trust the quality of the vaccine. A study in Sindh by Abbas et al. showed that most of the people were not aware of the availability of vaccine (n=503, 65%), however, more than half of them (n= 407, 52.6%), were trusting of its potency. Moreover, in our study almost all of them (n = 178, 96.2%) did not even consider COVID to be a real disease. Interestingly, only a small proportion (n = 42, 22.7%) thought that going to a crowded vaccination center would make them sick. This also implies that most of the population does not consider COVID to be a communicable disease and that social distance is not a necessary precaution.

The COVID-19 pandemic has changed the way the world has been working. However, a significant proportion of the Pakistani population still does not believe that COVID is even a real disease. Based on this assumption, they do not consider getting vaccinated to be important. As a result, only 4 million people have been fully vaccinated till 15th July 2021 in Pakistan.[22] Our study suggests that the majority of the population believes in different conspiracy theories regarding the COVID-19 vaccine and that may be the single most important factor preventing them from getting vaccinated. If fear and anxiety are the reasons people are not getting vaccinated, then the causes of their fears must be addressed. The government needs to focus more on educating people regarding the impact of COVID-19 and the significance of getting vaccinated. In order to increase the vaccinations, it is of utmost significance that the general population is taken on board.

This study had certain limitations. Firstly, a relatively small sample size was used for this study. Also, the data was conducted in lower middle class. Future studies should record the perceptions of the people from rural settings as well.

Conclusion

Lack of knowledge and awareness regarding COVID-19 and its vaccine has led to high levels of hesitancy among people. The government needs to run educational and awareness campaigns to inform people regarding the disease and the role of the vaccine in its prevention. Strict legislative measures also need to be implemented to ensure better results.

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Original Article

Parental Stress in Parents of Children with Chronic Physical, Metabolic and Sensory-Motor Disorders & Disabilities

Bilal Shoukat Awan[1], Darakhshaan Awan[2], Mahnoor Sohail[3], Ramesha Tahir[4], Kashif Tousif[5], Zuhair Ali Rizvi[6]

[1,3,4,5] *Fourth year medical student, Rawalpindi Medical University, Rawalpindi.*

[2] *Final Year medical Student, Rawalpindi Medical University, Rawalpindi.*

[6] *Senior medical officer, Shifa International Hospital, Islamabad*

Author's Contribution

[1,6] *Conception of study*
[1,3] *Experimentation/Study conduction*
[2,3,4,5,6] *Analysis/Interpretation/Discussion*
[1,2,3,4] *Manuscript Writing*
[1,2,3,5] *Critical Review*
Facilitation and Material analysis

Corresponding Author

Bilal Shoukat Awan
Fourth year medical student, Rawalpindi medical University, Rawalpindi
bilal.awanjs@gmail.com

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Abstract

Background & Objective: Parental stress is an aversive psychological reaction to parental duties, experienced typically when the demands of being a parent are not matched with the perceived resources available. Chronic illness or disability in a child represents a significant life stressor that can disrupt families in ways that at times can be more disabling than the physical condition itself. This study aims to compare mean stress scores in the parents of children with sensory-motor disorders, chronic physical disorders, and metabolic disorders using the Parental Stress Scale (PSS).

Methods: This descriptive cross-sectional study was conducted at Benazir Bhutto Hospital and Holy Family Hospital in Rawalpindi, Pakistan, for one year (January 2018 to January 2019). Parents of 195 children with permanent disabilities were interviewed using a non-probability consecutive sampling technique. Parental stress was determined using the Parental Stress Scale questionnaire via one-on-one interviews . The data were analyzed using IBM SPSS Statistics for Windows, Version 20.0. (Armonk, NY: IBM Corp.). Descriptive statistics were applied. Mean parental score was compared between parents of children with chronic physical, sensory-motor, and metabolic disorders, and $p<0.05$ was considered statistically significant.

Results: Mothers of 148 (75.9%) while fathers of 47 (24.1%) children were interviewed. Of 195 children included in the study, 105 (53.8%) were male while 90 (46.2%) were female. Mean age of the children was 6.2±3.9 years. Sixty-five (33.3%) children had sensory-motor diseases, 66 (33.8%) had chronic physical disorders, and 64 (32.8%) had metabolic disorders. Mean PSS came out to be 68.46±6.91. Stress was present in nearly all parents; 85.12% (n=166) of parents had low stress scores (60-80) and 5.13% had high stress scores (>80). Mothers had a higher PSS score (68.64±6.89) compared to fathers (67.87±7.01) (p=0.508). Parents of children with sensory-motor and metabolic disorders experienced more stress than parents of children with chronic physical disorders (p= 0.013).

Conclusion: In Pakistan, the stress scores of parents of children with chronic disorders are extremely high. Since mothers were found to be more affected by parental stress, remedies should be devised to ameliorate the situation. There is a dire need to address this issue and improve the quality of life through raising awareness, launching support groups, proper counseling and stress management therapy.

Keywords: *Parental Stress, Disabilities, Handicap, Sensory-motor loss*,

Introduction

Childhood chronic illness or disability represents a significant life stressor that can disrupt family life. The stress of the condition may be more disabling than the physical condition itself. A child's chronic illness may influence the parents' psychological adjustments and raising a child with any chronic disease is a demanding task for the parents [1]

Parental stress is basically an 'unpleasant psychological reaction to the requirements of being a parent, usually when the requirements of being a parent are unparalleled with the perceived resources accessible to the parent'. All parents may experience some degree of parenting stress (low degree of parenting stress) but it is seen that high parenting stress levels may have grave hostile effects on the family and their psychological health and overall robustness. Several theories suggest that parenting stress is decided by child, parent, family, and ecological characteristics that have impact on one another and contribute to aftereffects [2]. Parents of children suffering from sensory diseases experience raised stress and are more exposed to probable negative outcomes than parents of children having other disabilities [3].

Children with developmental disabilities often display more problematic behavior than their typically developing peers, which often leads to multiple adaptations by parents [4]. Stress has been defined as an emotional and behavioral response to an unpleasant event [5].

Moreover, chronic health conditions in childhood are increasing [6], and parents' distress interferes with assimilating new information at diagnosis. Parents report of having no information or misinformation, and they may distrust health-care professionals [7]. Parents' distress predicts the child's psychological adjustments and reduces the parents' ability to manage the condition effectively chronic disease [8]. Parents who have children with chronic conditions are disposed to increased level of stress, it is crucial not only to spot such stress in families with a child with a chronic condition but also to identify the factors that influence the stress levels [9].

These parents not only face age-typical caregiver tasks but also responsibilities related to illness management, such as dealing with health care providers or counterbalance the child's noncompliant behavior. Other sources of parental stress are unpredictability, lack of certainty of child's condition and worries about child's unpropitious prognosis. Also, raised levels of parenting stress are due to decline of familial resources like financial burdens and socioeconomic parameters, and clash between care giving tasks and other commitments may develop a sense of incompetence in the parenting role and affinity of the parent-child relationship [10,11].

This study's objective was to compare the mean stress scores using the Parental Stress Scale (PSS) in parents of children suffering from sensory-motor mental disorders, chronic physical disorders, and psychological disorders. We also investigated the potential effects of certain demographic variables, such as parental gender, child gender, and parental education on the parents' stress scores. Data regarding presence of parental stress in parents of disabled children is very scarce, especially when compared with the scale of the problem. Investigating the prevalence of parental stress in Pakistani population and identifying its characteristics and associations with various factors would provide information for formulating programs to spreading awareness about this grave issue. In addition, it would also push for exploring remedies to improve mental health and the quality of life for these parents.

Material and Methods

The study was conducted in the Pediatrics Department of Benazir Bhutto Hospital and Holy Family Hospital, Rawalpindi, for one year (January 2019 to January 2020) after ethical approval was granted by the Institutional Research Forum of Rawalpindi Medical University. A total of 195 participants were included in the study using a non-probability convenient sampling technique. Parents of children aged 1 to 16 years who have chronic physical diseases (e.g., diabetes, epilepsy, renal problems, and leukemia), difficulties in sensory-motor modalities (e.g., blindness, deafness, intellectual disability, and cerebral palsy), and social psychological problems (e.g., autism, attention deficit hyperactivity disorder, conduct disorders, oppositional disorders deficit disorders, and learning disabilities) were included in the study. We excluded the parents of multiple children with disabilities. Parents with other life stressors such as financial or marital issues or previously diagnosed psychological disorders were excluded.

Parents were interviewed in their native language according to the PSS Questionnaire [12]. Age and gender of the parents and the disabled child, birth order, type of disability, and parental education were noted. We compared the PSS with parental education, child gender, parental gender, and different disease groups. A score of 60% was considered a benchmark for the presence or absence of stress. Scores of 60% to 80% indicated low stress, and scores of >80% indicated high stress.

Descriptive statistics were applied for age, numbers of children, and PSS score. Means and standard deviation were determined. Mean PSS score was compared between parents of children with chronic physical, sensory-motor, and metabolic disorders, and $p<0.05$ was considered statistically significant.

Results

This study involved a total of 195 children (53.8%; n=105 males). The mean age of the children was 6.2±3.9 years. Mothers of 148 (75.9%) while fathers of 47 (24.1%) children were interviewed. Mean parental age was 31.7±5.7 years.

Fifty-eight parents (29.7%) were uneducated, 14 (7.2%) had primary school-level education, 81 (41.5%) had secondary level of education, 29 (14.9%) had matriculation level, while only 13 (6.7%) were educated to an intermediate level. Concerning the three disease groups, 65 (33.3%) children had sensory-motor diseases, 66 (33.8%) had chronic physical disorders, and 64 (32.8%) had metabolic disorders. Table no.1 illustrates the statistics of above observations.

Mean PSS came out to be 68.46±6.91. Stress was present in nearly all parents; 85.12% (n=166) of parents had low stress scores and 5.13% had high stress scores (>80).

Mean PSS was slightly higher for mothers (68.64±6.89) as compared to fathers (67.87±7.01) (p=0.508). This resulted in a corresponding difference in stratification as a higher percentage of mothers (90.58%, n= 134) having stress when compared with fathers (89.36%, n= 42) (p=0.872). Parents of 91.43% (n=96) disabled male children and 88.88% (n=80) of disabled female children had some degree of stress (p=0.786). Ninety-four percent (n=116) of parents who received secondary level, college and university education (n=123) were stressed, compared with 83.33% (n=60) parents with primary or no education. Table no.2 demonstrates above-mentioned observations.

Discussion

Limitative disorders in children can lead to stress not only for the individuals but also has significant association between the presence of disease in children and subsequent parental stress scores. Feizi et al. stated that parents of

children with sensory-motor mental, chronic physical, or psychological disorders have elevated stress indices [18]. Our study results align with these findings ($p<0.05$). Sabih et al. also confirmed this finding in his study based on autistic children [19]. Metabolic disorders like diarrhea in infants and toddlers can also lead to anxiety and agitation for parents [20].

Herring et al. revealed that the diagnosis alone resulted in lesser parental stress, rather the children's emotional and behavioural problems played a more significant role [21]. Compared with mothers, fathers reported significantly less stress in relation to parenting their child [21-22]. This trend was also seen in our study, however it was statistically insignificant. Sabih et al. also reported that mothers of disabled children undergo raised parenting stress and a greater impact than fathers [18]. On the other hand, our results align with Picardi et al.'s findings, who inferred that there was no difference between mothers and fathers for objective burden and depressive and anxiety symptoms [23]. Therefore, both the parents share a very similar view regarding the family's difficulties and challenges [13]. Several studies suggest that families of children with disabilities suffered from psychological problems. Furthermore we also found association between extra parental care for such children and stress scores [14-17]. Our child study gender found a higher percentage of parents experienced stress when the affected child was male, as compared to females. This trend was see in an Iranian study by Feizi et al. that concluded that parental stress scores in mothers of girls and mothers of boys showed considerable differences [19]. In addition, they also found out that the mothers of children with chronic physical problems who had attended college experienced more stress than mothers with lower education levels, which is also seen in our study where parental stress levels are higher in educated parents [19]. Parents of children belonging to all three disease groups experience increased yet different stress levels; the stress is comparatively higher in sensory-motor and metabolic disorders. Seltzer et al. also described that parents of children with developmental issues suffered from increased stress leading to depression and anxiety compared with parents of children with other diseases [24].

Our study has some potential limitations. First, the sample size is small as this study is conducted in government-sector hospitals of Rawalpindi. Second, quality of life should have been measured. The last worth mentioning limitation is that, this is a cross-sectional study thus valid for particular time and population.

Conclusion

In Pakistan, the stress in parents of children with chronic disorders is alarmingly high. This parental stress varies with the type of illness, as well as by parental gender, the gender of the affected child and educational status of parents. Parents of children with sensory-motor and metabolic disorders experience more stress than parents of children with chronic physical disorders. Parental stress, along with child disability, can lead to mental health problems for the parents and can lead to family dysfunction. Therefore, it is the need of the hour to take necessary steps and provide opportunities to address this issue through proper counseling of parents of disabled children.

Table 1: Description of Physical, Metabolic and Sensory-Motor Disabilities			
Type of illness	**Disease**	**N**	%
Sensory motor (n=65, 33.3%) Results	Epilepsy	26	13.3
	Cerebral Palsy	20	10.3
	Deaf and Dumb	14	7.2
	Blindness	3	1.5
	Motor Neuron Disease	2	1
Metabolic Disorders (n=66, 33.8%)	Transverse Myelitis	18	9.2
	Nephrotic Syndrome	17	8.7
	Developmental Delay	6	3.1
	Asthma	2	1
	Cystic Fibrosis	2	1
	Decompensated Chronic Liver Disease	2	1
	Idiopathic Thrombocytopenia Purpura	2	1
	Leukemia	2	1
	Lymphoblastic Lymphoma	2	1
	Afibrinogenemia	1	0.5
	Aplastic Anemia	1	0.5
	Chronic Diarrhea	1	0.5
	Hemophilia	1	0.5
	Hodgkin's Lymphoma	1	0.5
	Hypothyroidism	1	0.5
	Intestinal Tuberculosis	1	0.5
	Kwashiorkor	1	0.5
	Liver Abscess	1	0.5
	Non-Hodgkin's Lymphoma	1	0.5

	Myeloma	1	0.5
	Retinoblastoma	1	0.5
	Thrombocytopenia	1	0.5
	Rickets	17	8.7
	Down Syndrome	8	4.1
	Cleidocranial Dysotosis	7	3.6
	Hydrocephalus	6	3.1
	Microcephaly	5	2.6
	Meningomyelocele	3	1.5
	Rheumatic Heart Disease	3	1.5
	Ventricular Septal Defect	3	1.5
	Arthritis	2	1
	Bulbar Palsy	1	0.5
	Dilated Cardiac Disease	1	0.5
	Hip Joint Dislocation	1	0.5
	Juvenile Rheumatoid Arthritis	1	0.5
	Patent Ductus Arteriosus	1	0.5
	Renal Rickets	1	0.5
	Spina Bfida	1	0.5
	Muscular Dystrophy	3	1.5
Total		195	

Table 2: Association of Parental Stress Score with various factors

		Parental Stress Score			Total	p-valvue
		No Stress (<60)	Low Stress (60-80)	High Stress (>80)		
Parental Gender	Male	5 (10.63%)	39 (82.98%)	3 (6.38%)	47	0.872
	Female	14 (9.46%)	127 (85.81%)	7 (4.73%)	148	
Affected Child Gender	Male	9 (8.57%)	90 (85.71%)	6 (5.71%)	105	0.786
	Female	10 (11.11%)	76 (84.44%)	4 (4.44%)	90	
Parental Education	Uneducated	9 (15.52%)	46 (79.31%)	3 (5.17%)	58	0.284
	Primary	3 (21.43%)	10 (71.42%)	1 (7.14%)	14	
	Secondary	5 (6.17%)	73 (90.12%)	3 (3.70%)	81	
	College	1 (3.45%)	25 (86.21%)	3 (10.34%)	29	
	University	1 (7.69%)	12 (92.31%)	0	13	
Types of Illness	Sensory-Motor	4 (6.15%)	60 (92.31%)	1 (1.54%)	65	0.013*
	Chronic Physical	11 (16.67%)	48 (72.72%)	7 (10.61%)	66	
	Metabolic Disorders	4 (6.25%)	58 (90.62%)	2 (3.12%)	64	

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Original Article

Awareness Of Mothers Regarding the Weaning Practices and Factors Affecting Them: A Descriptive Cross-Sectional Study

Tayyab Mumtaz Khan[1], Sana Mansoor[2], Manahil Jamil[3], Malik Shehr Yar[4], Kiran Mujahid[5] Zohaib Saleem[6]

[1] *BSC, MBBS, House Officer, Rawalpindi Medical University and Allied Hospitals, Rawalpindi.*
[2,3] *MBBS, House Officer, Rawalpindi Medical University and Allied Hospitals, Rawalpindi.*
[4] *MBBS, Post Graduate Trainee, Medicine Department, Holy Family Hospital, Rawalpindi.*
[5] *Student at The University of Faisalabad, Faisalabad.*
[6] *Student at University of Agriculture, Faisalabad.*

Author's Contribution

[1] *Conception of study*
[2] *Experimentation/Study conduction*
[1,3] *Analysis/Interpretation/Discussion*
[1,2,4] *Manuscript Writing*
[4,5] *Critical Review*
[5,6] *Facilitation and Material analysis*

Corresponding Author

Dr. Tayyab Mumtaz Khan
House Officer,
Rawalpindi Medical University and Allied Hospitals,
Rawalpindi
Email: tayyab.mkhan98@gmail.com

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Abstract

Background: Exclusive breastfeed after 6 months of age is not adequate for the growing body of infants, so, the start of weaning at this age is very essential for the proper growth of infants and the prevention of malnutrition.

Objectives: Weaning practices are affected by various factors; hence, this study was conducted to assess the awareness levels of mothers regarding weaning practices and factors impacting them.

Material and Methods: This descriptive cross-sectional study was conducted among the mothers of infants in the general population of Rawalpindi. Convenient sampling was applied to recruit participants. A self-structured proforma was used to collect data which was analyzed via IBM SPSS version 25. The Chi-square test was used to assess the association between awareness regarding weaning and factors affecting it.

Results: There was a high percentage of mothers who were not aware (33.90%) of age at which weaning should start, type of feed used for weaning (39.80%), and quantity of food that should be given to infants during weaning (41.50%). Awareness of mothers regarding the age of weaning was affected significantly by all included factors (Mother's age, Mothers' educational status, Mother's working status, Socioeconomic status, and Parity). However, in the current study, awareness of mothers regarding the type of food for weaning was affected significantly by four of the included factors except for mother's working status, whereas, awareness regarding the quantity of food for weaning was affected significantly only by three factors with the exclusion of mother's working status and socioeconomic status.

Conclusion: In a nutshell, there is a high prevalence of unawareness among mothers regarding weaning. Various factors affect awareness, and by controlling these factors we can improve awareness about weaning and subsequently, we can also achieve improvement in the growth of infants and prevent malnutrition.

Key Words: *Awareness, Weaning, Mothers, Infants, Cross-Sectional.*

Introduction

Breast milk is the most appropriate available milk for infants because it is exclusively modified to their needs and meets the caloric requirements of an infant till the age of 6 months (1). The American Academy of Pediatrics recommends feeding infant only breast milk for the first six months of its life (2). After the age of six months, breast milk alone cannot deliver all the energy and protein required for the development of the infant (3). Furthermore, according to WHO: exclusive breastfeeding for 6 months has many benefits for both, the infant and the mother, but after the age of 6 months, an infant's requirement for nutrition starts to surpass what is provided by breast milk, and supplementary foods are needed to meet those requirements (4).

The period from birth to 12 months of age includes the period of exclusive breastfeeding i.e., the first 6 months, and the weaning period i.e., the period of reducing breastfeeding and introducing foods other than breast milk to the infant's diet (5). These foods are generally soft and mushy e.g., formula milk, mashed fruit and vegetables, and rice, chickpea and, lentil-based diets (6,7). Moreover, in low-socioeconomic societies, weaning is often accompanied by low health and undernourishment, primarily as a result of weaning foods that are not equipped to meet the infant's requirements (8). Poor weaning practices during infancy results in protein-energy malnutrition and contribute to impairment of cognitive and social development, resulting in poor productivity in later life (9). Malnutrition and Nutrient deficits during the weaning period have been reported from Pakistan (1) and many other developing countries (3,10). Additionally, a study in India has suggested that persistent undernutrition in the country is associated with inadequate feeding practices (11).

Studies have found several factors affecting the weaning process. They include the mother's age, education, occupation, parity, socioeconomic status, and past experience of weaning (12, 13). Awareness of mothers regarding the factors affecting the weaning process will help in planning interventions to improve weaning practices. According to our knowledge, studies have been conducted in developing countries regarding weaning practices, a study was conducted at the National level in Lahore in 2016, which showed that awareness among mothers of infants about weaning practices is inappropriate and inadequate (14). In the presence of international and national studies regarding weaning practices, our study aims to assess the awareness of mothers about weaning practices and factors that affect them, in the local population of Rawalpindi, as there is no recent survey has been conducted to evaluate this. After assessing awareness and evaluating the factors which impacting it, we would be able to plan interventions and controlling the factors affecting weaning practices. This would consequently lead to the growth of healthy infants and the prevention of illnesses due to malnutrition.

Materials and Methods

We conducted a descriptive cross-sectional study among mothers of infants in the general population of Rawalpindi, Pakistan, from May 2021 to July 2021. Study sample size was calculated via WHO calculator and it was 358 with confidence interval of 95%. Participants were selected via convenient sampling and according to our established inclusion and exclusion criteria for this study. Mothers with infants of age 6-12 months and who had started weaning were included in the study, whereas, infants below the age of 6 months, who had not started weaning were excluded. Before the collection of data, the aim of the study was also explained to the participants and informed consent was acquired from each participant. Data was collected through a self–structured proforma, including demographic details of the

mother and infant, and Awareness of the mother regarding weaning practices.

Assessment of Demographic details of the study population included Infant gender, Age of Mother and infants, Mother's educational status, mother's working status, parity, and Socioeconomic Status. For the evaluation of awareness of mothers regarding weaning practices, we asked the mothers about the age at which weaning should be started, the type of food that should be given to the infants during weaning and the quantity to be given for weaning. Furthermore, we assessed mothers' awareness about the type of supplementary feeding, the preferred food for weaning, whether the mother has decreased breastfeed or not, the reason for not starting supplementary feed at 6 months, age at which supplementary feed of Siblings started, discontinuation of supplementary feed during mother and infant's illness and lastly about the source of information regarding weaning practices.

Data analysis was performed via IBM SPSS Version 25. Descriptive and inferential statistics were used. First, we described the quantitative variables, by descriptive statistics. Then Chi-square analysis was applied to evaluate the relationship between Awareness of mothers about the age at which weaning should start, type of food should be given during weaning, the quantity of feed during weaning should be given, and factors that may affect it directly or indirectly e.g., mother's age, mother's educational status, mother's working status, socioeconomic status, and parity. P-value less than 0.05 was taken as statistically significant.

Results

Out 118 participating mothers, 218 (61.0%) had female infants whereas, 140 (39.0%) had male infants. Our study includes infants of the age 6-12 months, which were further divided into two groups including, 6-9 months (218 i.e., 61%) and 10-12 months (140 i.e., 39%).

Table I demonstrates, the proportion of awareness in mothers of infants about the age at which weaning should start and the relationship between awareness regarding age at which weaning should be started and factors affecting them. Awareness about the age of weaning was associated significantly with the mother's educational status, age of mother, mother's working status, socioeconomic status, and parity. Literate mothers, working women, mothers with age range 20 to 30 years, mothers belonging to middle-class, and mothers with higher parity were more aware of the age at which weaning should be started in infants.

Table I: Awareness Regarding Age of Weaning and Factors Affecting It

Parameter		Awareness regarding Age of Weaning		Chi- Square
		Yes	No	P- value
Total=358		237 (66.10%)	121 (33.90%)	
Mother's Educational status	Illiterate N=155 (43.20%)	55 (35.29%)	100 (64.70%)	0.0001
	Literate N=203 (56.80%)	182 (89.55%)	21 (10.45%)	
Age of Mother	< 20 years N=82 (22.90%)	76 (92.59%)	6 (7.41%)	0.008

	20-30 years N=182 (50.80%)	109 (60.0%)	73 (40.0%)	
	30-40 years N=67 (18.60%)	40 (59.09%)	27 (40.91%)	
	>40 years N=27 (7.60%)	12 (44.44%)	15 (55.56%)	
Mother's Working status	Working Women N= 106 (29.70%)	91 (85.71%)	15 (14.28%)	0.003
	House wife N=252 (70.30%)	146 (57.83%)	106 (42.17%)	
Socioeconomic Status	Lower Class N=200 (55.90%)	124 (62.12%)	76 (37.88%)	0.022
	Middle Class N=137 (38.10%)	107 (77.78%)	30 (22.22%)	
	Upper Class N=21 (5.90%)	6 (28.57%)	15 (71.43%)	
Parity	<3 N=121 (33.90%)	48 (40.0%)	73 (60.0%)	0.0003
	>3 N=237 (66.10%)	188 (79.48%)	49 (20.52%)	

Table II displays, Awareness of mothers of infants regarding the type of food to be given during weaning and its association with factors impacting it. Awareness regarding the type of food for weaning was affected significantly by the mother's educational status, age of mother, socioeconomic status, and parity, although it was not affected by the working status of mothers significantly. Literate mothers, working women, mothers with age more than 40 years, mothers with upper-class status and with higher parity were more aware of the type of food which should be used for weaning.

Table II: Awareness Regarding Type of Food for Weaning and Factors Affecting It

Parameter		Awareness regarding Type of Food for Weaning		Chi- Square
		Yes	No	P- value
Total=358		216 (60.20%)	142 (39.80%)	
Mother's Educational status	Illiterate N=155 (43.20%)	64 (41.17%)	91 (58.83%)	0.0002
	Literate N=203	151 (74.62%)	52 (25.38%)	

	(56.80%)			
Age of Mother	< 20 years N=82 (22.90%)	67 (81.48%)	15 (18.52%)	0.001
	20-30 years N=182 (50.80%)	91 (50.0%)	91 (50.0%)	
	30-40 years N=67 (18.60%)	30 (45.45%)	37 (54.55%)	
	>40 years N=27 (7.60%)	27 (100.0%)	0 (0.0%)	
Mother's Working status	Working Woman N=106 (29.70%)	70 (65.72%)	36 (34.28%)	0.424
	House Wife N=252 (70.30%)	146 (57.83%)	106 (42.17%)	
Socioeconomic Status	Lower Class N=200 (55.90%)	106 (53.03%)	94 (46.97%)	0.041
	Middle Class N=137 (38.10%)	88 (64.44%)	49 (35.56%)	
	Upper Class N=21 (5.90%)	21 (100.0%)	0 (0.0%)	
Parity	<3 N=121 (33.90%)	51 (42.50%)	70 (57.50%)	0.005
	>3 N=237 (66.10%)	164 (69.23%)	73 (30.77%)	

Table III presents, Awareness of mothers of infants about the quantity of food to be given during weaning and the link between this awareness and factors influencing it. Awareness regarding the quantity of food for weaning was impacted significantly by the mother's educational status, age of mother, and parity, however, it was not affected by the working status of mothers and socioeconomic status of mothers significantly. Awareness level regarding the quantity of food to be given during weaning was higher among literate mothers, working women, mothers with age more than 40 years, mothers with upper-class status and with higher parity.

Table III: Awareness regarding Quantity of food for Weaning and Factors affecting it

Parameter		Awareness regarding Quantity of Food for Weaning		Chi- Square
		Yes	No	P- value
Total=358		209 (58.50%)	149 (41.50%)	
Mother's Educational status	Illiterate N=155 (43.20%)	61 (39.21%)	94 (60.79%)	0.0001
	Literate N=203 (56.80%)	148 (73.13%)	55 (26.87%)	
Age of Mother	< 20 years N=82 (22.90%)	64 (77.78%)	18 (22.22%)	0.003
	20-30 years N=182 (50.80%)	100 (55.0%)	82 (45.0%)	
	30-40 years N=67 (18.60%)	21 (31.81%)	46(68.19%)	
	>40 years N=27 (7.60%)	24 (88.89%)	3 (11.11%)	
Mother's Working status	Working Woman N=106 (29.70%)	70 (65.72%)	36 (34.28%)	0.300
	House Wife N=252 (70.30%)	140 (55.42%)	112 (44.58%)	
Socioeconomic Status	Lower Class N=200 (55.90%)	106 (53.03%)	94 (46.97%)	0.054
	Middle Class N=137 (38.10%)	82 (60.0%)	55 (40.0%)	
	Upper Class N=21 (5.90%)	21 (100.0%)	0 (0.0%)	
Parity	<3 N=121 (33.90%)	48 (40.0%)	73 (60.0%)	0.004
	>3 N=237 (66.10%)	161 (67.94%)	76 (32.06%)	

Table IV indicates feedback and percentages of responses of participants regarding the various aspects of weaning.

Table IV: Demonstration of Feedback about Weaning

Questions	Feedback	No. of responses	Percentage
Preferred Food	Breast feed	55	15.30%
	Bottle feed	133	37.30%
	Mixed feed	170	47.50%
Supplementary feed started at 6 months	Yes	209	58.50%
	No	149	41.50%
Reason for not starting supplementary feed at 6 months	Baby refused	28	7.60%
	Social cause	58	16.10%
	Unawareness	56	15.30%
	Not applicable	216	60.00%
Age at which supplementary feed stared to sibling	Not applicable	21	5.90%
	6-9 months	222	61.90%
	10-12 months	115	32.20%
Type of Supplementary feed given	Formula diet	88	24.60%
	Homemade food	200	55.90%
	Fruits	70	19.50%
Supplementary Feeding discontinued during mother's illness	Yes	237	66.10%
	No	121	33.90%
Supplementary feeding discontinued during Child's illness	Yes	255	71.20%
	No	103	28.80%
Frequency of Breast feeding reduced during weaning	Yes	185	51.70%
	No	94	26.30%
	Stopped	79	22.00%
Source of information regarding Awareness of supplementary Feed	Doctor	43	11.90%
	Family member	197	55.10%
	Media	118	33.10%

Discussion

Weaning after the age of six months, is necessary for proper growth of infants. Researches have shown that proper weaning practices lead to adequate growth of infants (15). But unfortunately, the awareness among the mothers of infants is still inadequate regarding weaning practices in both first class and third class countries, however, unawareness is markedly high among mothers of developing countries like Pakistan and India (14), (10).

Our study has assessed the awareness of mothers of infants regarding weaning and has also highlighted the factors that impact weaning practices among infants. According to results of our study, awareness level among regarding the exact age at which weaning should start, type of

food should be given during weaning, and quantity of food for weaning, is still not up to the mark and need to be increased. 66.10% of our study population were aware about the exact age of weaning, while 33.90% were still not aware. Similarly, awareness regarding the type of food and kind of food was still at not that level, where should be. Only 60.20% participants about type of food and 58.50% participant regarding quantity of food were aware while 39.80% and 41.50% were not aware about these two essential aspects of weaning practices. A study that was conducted in India has showed consistent results and overall high level of unawareness (21.10%) about proper weaning (3)

Weaning practices is impacted by various factors, so by controlling these factors, we would be able to improve weaning practices. Our study has displayed that, awareness concerning age of weaning was influenced by mother's age (p=0.008), mother's educational level (p=0.0001), mothers working status (p=003), socioeconomic status (p=0.022), and parity (p=0.0003) statistically significantly. Awareness about type of food for weaning was correlated with mother's age (0.001), mother's educational status (p=0.0002), socioeconomic status (p=0.041), and parity (p=0.005) significantly, however, not by mother's working status with significantly (p=0.424). Likewise, awareness relevant to quantity of food, was affected by mother's age (p=0.003), mother's educational status (p=0.0001), and parity (p=0.004) significantly, while not significantly by mother's working status (p=0.300) and socioeconomic status (p=0.054). In literature, a study has that was conducted in Rural Sindh, Pakistan, reported similar finding (16). Our study has suggested that overall, awareness level was higher among literate, working women, mothers with middle and upper class status, and mothers with high parity, than illiterate, house wives, mothers with lower class status and lower parity, while mixed trend of lower and higher level awareness for age of mothers. So, by controlling these factors we could improve weaning practices and the consequently the health of growing infants.

Other important findings, in this study were, percentages of different aspects of weaning practices. Most commonly feed for weaning was mixed feed (47.50%), most of the participating mothers stared weaning at the age of 6 months (58.50%), most reason for not starting supplementary feed a six months was social cause (16.10%), similarly, in most of the cases, complimentary feed was started to siblings at 6 months (61.90%), homemade feed was most common supplementary feed (55.90%), feed was reduced in illnesses of both mothers (66.10%) and infants (71.20%), frequency of breast feed was reduced in most of the cases (51.70%), and the most common source of information concerning to weaning was family member (55.10%). A research has presented similar findings (3).

So, our study suggests that by controlling factors that impact awareness of mothers regarding weaning we could improve, weaning practices and subsequently, the health and growth of infants could be optimized.

Limitations

Although we collected data with best possible accuracy, but still our study has some limitations, first of all is self-structured, in which we might have skipped some aspects related to weaning and the other one is exclusion mothers with infants who had any structure abnormality. Further, researches are required to assess the weaning practices among the mothers of infants with structure abnormality, so that, we

could improve their best possible growth as well.

Conclusion

Awareness of mothers about the age of weaning is affected significantly by mother's age mother's educational status, mother's working status, socioeconomic status, and parity. Awareness of type of food for weaning was affected significantly by same factors with exception of mother's working status while Awareness about the quantity of food was also showed significant results for three of these factors with exception of two factors i.e., working status of mothers and socioeconomic status. There was still a high percentage of mothers who were not aware of the weaning practices. By providing proper awareness to this percentage of we can avoid malnutrition and illnesses that are caused by improper weaning practices.

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Original Article

Severity of Late Onset Sepsis and Factors Affecting it Among the Neonates in a Tertiary Care Hospital: A Cross-Sectional Study

Tayyab Mumtaz Khan[1], Somia Bibi[2],Bilal Sharif[3],Sania Seemab[4],Malik Shehr Yar[5] ,Madeeha Mumtaz[6]

[1]BSC, MBBS, House Officer, Rawalpindi Medical University and Allied Hospitals, Rawalpindi.

[2,3,4]MBBS, House Officer, Rawalpindi Medical University and Allied Hospitals, Rawalpindi.

5MBBS, Post Graduate Trainee, Medicine Department, Holy Family Hospital, Rawalpindi.

6Lecturer at Government Rabia Basri Graduate College for Women, Walton Road, Lahore.

Author's Contribution

[1] Conception of study
[2,4] Experimentation/Study conduction
[1,3] Analysis/Interpretation/Discussion
[1,2,4] Manuscript Writing
[2,4,5] Critical Review
[3,5,6] Facilitation and Material analysis

Corresponding Author

Dr. Tayyab Mumtaz Khan
House Officer,
Rawalpindi Medical University and Allied Hospitals,
Rawalpindi
Email: tayyab.mkhan98@gmail.com

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Abstract

Background: Sepsis is a major health problem all over the world, and it's more lethal among neonates because of their inadequate and developing immunity. Late-onset sepsis (LOS) develops when neonates get an infection from the community or the hospital and it has a very poor prognosis in neonates. It gets influenced by many maternal and neonatal factors.

Objectives: This study was conducted with the objectives to assess the severity of LOS and the factors that determine it.

Material and Methods: This cross-sectional was conducted in a tertiary care hospital of Rawalpindi, Pakistan from June 2021 to August 2021. Participants were enrolled through nonprobability convenient sampling and fixed inclusion and exclusion criteria. Informed consent was taken from parents of all neonates and the objectives of the study were explained to them. Data was collected by self-designed proforma. Data was analyzed via descriptive and inferential statistics using IBM SPSS v 25. Chi-Square test was applied to determine the link between the severity of LOS and various included factors while a p-value less than 0.05 was considered significant.

Results: Severity of LOS was influenced significantly by mother's education, mother's parity, gender, gestational age, birth weight, cord clamping, congenital abnormality, feeding type, feeding hygiene, the passage of central catheter, while the impact of mother's age and socioeconomic status was insignificant. The Incidence of severe degree of LOS was higher among neonates whose mothers' had, illiterate educational status, young age, parity >3, lower-class status, and those neonates who had, male gender, preterm birth, low birth weight, early cord clamp, congenital abnormality, bottle feed, poor feeding hygiene, and the central catheter.

Conclusion: In brief, the severity of the late-onset sepsis is affected by various maternal and neonatal factors. By proper handling of these factors, we could bring a decline in neonatal mortality, and consequently, it would lead to a decrease in load over limited resources of public sector hospitals and a decline in burnout among physicians.

Key Words: *Severity, Sepsis, Factors, Neonates, Hospital.*

Introduction

Late-onset sepsis (LOS) develops when neonates get an infection, either from community or hospital from the 4th day of life till the 4th month of life (1), (2), (3). The symptoms and signs of LOS included, irritability, lethargy, skin color changes (grey or pale), feeding difficulty, fever, increased sleep apnea episodes, increased capillary refill time of more than 2 seconds, respiratory distress (chest retraction, cyanosis, nasal flaring and increased respiratory rate more than 60 breaths per minutes), raised oxygen supplementation need, and tachycardia (more than 180 beats per minutes), (4). These symptoms and signs along with investigations like CRP (C-reactive protein), TLC (Total Leucocytes count), decreased platelet count, decreased neutrophil count, blood culture, urine routine examination, urine culture, and, x-rays of various parts of the body lead to the diagnosis of the sepsis in neonates.

Despite huge advancements in the medical field, sepsis is one of the major causes of death among neonates around the globe. Out of 130 million newborns, more than 4 million die at the start of their lives, especially in the neonatal period of four weeks (5), (6). The neonatal mortality rate is at alarming levels in third world countries of the world, and it is estimated that more than 10,000 neonates pass away every single day (7). The neonatal mortality rate is improved all over the world, however, the major neonatal mortality in Asia occurs in three countries including, India, Pakistan, and Bangladesh (5). So, more strict action for the prevention of mortality is required in these countries.

Sepsis is impacted by versatile factors and these factors are related to both mothers and neonates. The maternal factors are those, that are linked strongly with mothers and these include, mother's age, mother's educational status, mother's parity, and socioeconomic status (9), (10), (11), (12). Neonatal factors include gender, gestational age, birth weight, cord clamping time, congenital disorder, feeding type, feeding hygiene, and central catheter (1), (2), (3), (5), (13), (14), (15), (16).

Although multiple studies have been presented all over the world related to late-onset sepsis at national and international levels (5), (13), (14), however, the recent studies that could explain factors that affect late-onset sepsis among neonates are few or almost none. We conducted this study to find out various neonatal and maternal risk factors. Some of these risk factors are preventable, therefore, by sensitizing health care providers and the general public about these preventable risk factors, we could decrease incidence and severity of LOS. The prevention of neonatal sepsis will improve neonatal mortality rate and will decrease the load on limited resources of public sector hospitals. Consequently, burnout incidence among physicians will also go down.

Material and Methods

We conducted this comparative cross-Sectional Study in the neonatal intensive care unit (NICU) of a tertiary care hospital of Rawalpindi, Pakistan among neonates who had been diagnosed with late-onset sepsis from June 2021 to August 2021. The sample size was calculated through the WHO calculator and it was 325 with a confidence interval of 95%. We selected the study population through a nonprobability convenient sampling and established inclusions and exclusion criteria. Only neonates with the age range between 4 to 28 days were taken in the study while the age less than 4 days and more than 28 were excluded from the study. We could add infants too in our research to assess LOS in them as well, but as we conducted this study in NICU where only neonates whose age ranges between 4 days to 28 days get admission, hence we excluded elder ones, although the age limit for LOS in literature is 120 days (3). Data was taken via self-designed proforma, before the beginning of data collection, we took informed consent from the parents of neonates and the objectives of the research were explained to them. Proforma had three portions, the first was related to demographic details, second was about the severity of late-onset sepsis (sepsis that develops after 4th days till 28th of life)

based on signs, symptoms, and lab findings. The third portion was relevant to factors that impact sepsis severity. In demographic details, we inquired information related to the age of neonates (in days), gender of neonates (male or female), mother's age (younger =less than 30 years or Elder= Above than 30 years), mother's education (Literate or Illiterate), mother's parity (Less than 3 or more than 3), and mother's socioeconomic status (Lower Class or Middle class). In the second portion, sepsis was diagnosed via clinical signs and symptoms along with CRP (C-reactive proteins), TLC (Total lymphocytes count), TNC (total neutrophil count), PC (platelet count), and chest X-ray. Signs and symptoms for sepsis included fever, feeding difficulty, skin color changes (Mottled colored), lethargy, Irritability, frontal bulging, tachycardia or bradycardia, tachypnea, apnea, cyanosis, nasal flaring, substernal or chest retraction, and grunting. Diagnostic values of laboratory investigations CRP, TLC, TNC, and PC were more than 10mg/L, more than 30,000/mm^3 or less than 4000/mm^3, less than 1000/mm^3, and less than 100,000/mm^3 respectively. On X-ray patchy or full lobe consolidation was taken diagnostic. These laboratory findings have been used in various researches for the diagnosis of LOS all over the world (17), (18). Sepsis was divided into three grades on the basis of clinical picture and investigations. These grades included mild, moderate, and severe. Neonates who had presented with fever, lethargy, Irritability, tachypnea, tachycardia, and poor feeding along with raised TLC, and raised CRP, were considered to have mild sepsis. Neonates who had additional signs, symptoms, and decrease platelet count (thrombocytopenia) along with the clinical picture and lab findings of mild sepsis, were labeled to have moderate sepsis. Additional signs and symptoms for moderate sepsis included frontal bulging, skin color changes (mottled colored skin), increased capillary refill time (more than 2 seconds), and hypotonia. Neonates with severe sepsis had respiratory distress (apnea, nasal flaring, chest or substernal retraction, and cyanosis), seizures or even coma and neutropenia (decreased neutrophil count), and X-ray findings along with signs, symptoms, and lab findings of mild and moderate sepsis (19). The third portion of the proforma of questions related to risk factors that influence the severity of sepsis other than demographic factors. Factors were categorized into maternal and neonatal. Maternal factors were mainly demographic, therefore, these were mentioned in the first portion of proforma which was related to demographic details. Factors relevant to the neonates consisted of gestational age (Preterm=less than 37 weeks, Term=37 to 41weeks), birth weight (Normal: 2.5kg or more, Low birthweight: less than 2.5kg), cord clamping (Early mean within one minute after delivery or Late means after five minutes of delivery), presence of congenital abnormally (Yes or No), feeding type (breast or bottle), feeding hygiene (Good or Poor), and central catheter passed (Yes or No). After the collection of data, data analysis was conducted through IBM SPSS version 25. We applied descriptive and inferential statistics in our study. First descriptive statistics were used to quantify quantitative variables then inferential statistics via Chi-Square test was put into action to know how various risk factors influence late-onset sepsis in neonates or the relationship between risk factors and LOS severity. Value of p less than 0.05 was set as statistically significant.

Results

From a total of 325 participants, male neonates were 190 (58.50%) and female neonates were 135 (41.50%). The mean values for the study population of gestational age, age, and weight were 39 week, 18 days, and, 3.24 kg respectively. Percentages of three degrees of sepsis based on above mentioned, are shown in figure I , the most frequent degree of sepsis was mild with a percentage of 53.66%, moderate had intermediate frequency with a percentage of 30.08%, whereas, severe sepsis with a percentage of 16.26% least had the least frequency.

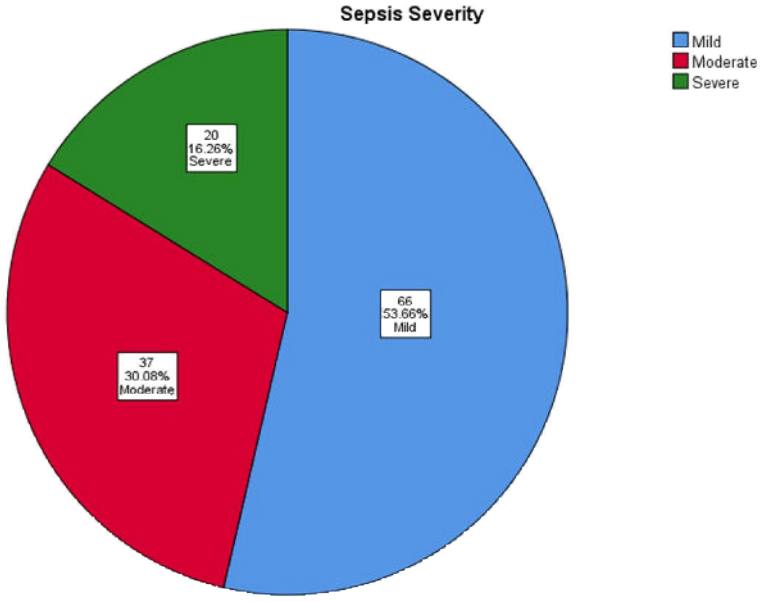

Figure Ⅰ indicates the percentage of each degree of sepsis on the basis of its severity.

Table Ⅰ displays, the correlation between various included maternal factors and severity of LOS. Frequency of severe sepsis was more common in neonates whose, mothers had illiterate educational status, young age, high parity (more than 3), and lower-class socioeconomic status.

Table Ⅰ: Percentages of LOS degrees and Maternal Factors affecting it.

Parameter		Late Onset Sepsis Severity			Chi- Square
		Mild	Moderate	Severe	
Total=325		174 (53.66%)	98 (30.08%)	53 (16.26%)	P- value
Mother's Educational status	Illiterate N=201 (61.80%)	119 (59.20%)	42 (21.10%)	40 (19.70%)	
	Literate N=124 (38.20%)	55 (44.50%)	55 (44.50%)	14 (11.00%)	0.018
Age of Mother	Elder N=162 (49.90%)	98 (60.50%)	45 (27.70%)	19 (11.80%)	
	Younger N=163 (50.20%)	85 (52.20%)	47 (28.80%)	31 (19.00%)	0.725

Mother's Parity	<3 N=137 (42.30%)	84 (61.50%)	47 (34.60%)	6 (3.90%)	0.006
	3> N=188 (57.70%)	90 (47.90%)	50 (26.80%)	48 (25.30%)	
Socioeconomic Status	Lower Class N=246 (75.60%)	104 (42.30%)	60 (24.40%)	82 (33.40%)	0.239
	Middle Class N=79 (24.40%)	29 (36.70%)	29 (36.70%)	21 (26.60%)	

Table Ⅱ (A and B) manifests that association between different included neonatal factors and severity of LOS. Incidence of severe sepsis was higher in neonates who had male gender, preterm birth, low birth weight, early cord clamping, congenital abnormality, bottle feeding, poor feeding hygiene, and passage of central catheter.

Table Ⅱ (A): Percentages of LOS degrees and Neonatal Factors affecting.

Parameter		Late Onset Sepsis Severity			Chi-Square
		Mild	Moderate	Severe	P- value
Total=325		174 (53.66%) (%)	98 (30.08%)	53 (16.26%)	
Gender	Male N=190 (58.50%)	71 (37.50%)	79 (41.70%)	40 (20.80%)	0.0001
	Female N=135 (41.50%)	103 (76.50%)	19 (13.70%)	13 (9.80%)	
Gestational Age	Preterm N=90 (27.60%)	29 (32.40%)	21 (23.50%)	40 (44.10%)	0.001
	Term N=235 (72.40%)	145 (61.80%)	77 (32.60%)	13 (5.60%)	
Birth Weight	Normal Weight N=206 (63.40%)	119 (57.70%)	71 (34.60%)	16 (7.70%)	0.003
	Low Birth Weight N=119 (36.60%)	56 (46.70%)	26 (22.20%)	37 (31.00%)	
	Early N=156 (48.00%)	70 (45.30%)	49 (31.20%)	37 (23.50%)	0.049

Cord Clamping	Late N=169 (52.00%)	106 (62.70%)	49 (28.80%)	14 (8.50%)	
Congenital Abnormality	Present N=63 (19.50%)	8 (12.50%)	29 (45.80%)	26 (41.60%)	0.0001
	Absent N=262 (80.50%)	167 (63.60%)	68 (26.20%)	27 (10.20%)	

Table Ⅱ(B): Percentages of LOS degrees and Neonatal Factors affecting it.

Parameter		Late Onset Sepsis Severity			Chi- Square
		Mild	Moderate	Severe	P- value
Total=325		174 (53.66%)	98 (30.08%)	53 (16.26%)	
Feeding Type	Breast N=211 (65.00%)	135 (63.80%)	66 (31.30%)	10 (5.00%)	0.0001
	Bottle N=114 (35.00%)	40 (34.90%)	32 (27.90%)	42 (37.20%)	
Feeding Hygiene	Good N=124 (38.20%)	84 (68.10%)	37 (29.80%)	3 (2.10%)	0.002
	Poor N=201 (61.80%)	90 (44.70%)	61 (30.30%)	50 (25.00%)	
Central Catheter	Yes N=108 (33.30%)	31 (29.30%)	23 (21.90%)	54 (49.80%)	0.0006
	No N=217 (66.70%)	143 (65.90%)	74 (34.10%)	0 (0.00%)	

Discussion

Sepsis is one of the leading causes of mortality among neonates, despite the great improvement in the medical field. Sepsis is affected by various factors, of which some are controllable and they need special measures to prevent deteriorating effects of sepsis.

In this study, we calculated the percentages of the mild, moderate, and severe LOS based on clinical signs, symptoms, and lab findings as mentioned in the material and method portion. The percentages of mild, moderate, and severe LOS were 53.66%, 30.08%, 16.26% respectively. Incidence of severe sepsis was higher in neonates whose mothers had illiterate educational status, young age, lower-class status, higher parity, and neonates who had male sex, less gestational age, low birth weight, early cord clamping, congenital abnormality, bottle feeding, poor feeding hygiene, and central catheter.

Subsequently, we noted the association between the severity of LOS and factors impacting it. In this phase of analysis, we evaluated the impact of maternal factors on the severity of LOS one by one. The role of mother mothers' education was significant (p=0.018) in the determination of severe LOS frequency and sepsis frequency was higher among neonates with illiterate mothers. Similar results were found in research that was carried out in Bangladesh (9). Next, we noted that neonates with mothers who had higher parity, had also a higher incidence of severe LOS and the effect of mothers' parity was significant (p=0.006) on LOS severity. A study that was conducted in Ghana reported similar results (10). Then we observed that in spite of the insignificant (p=0.725) effect of mothers' age on LOS severity, the severe LOS frequency was higher among younger mothers' neonates and this proposal of our research project was identical to research in literature that was carried out at the United States Of America, even though in this research the impact of mothers' age on LOS severity was significant (11). At the end of this phase of analysis, we noticed that although the occurrence of severe LOS was higher among the lower class of participants, nevertheless the impact of socioeconomic status in our study result was insignificant (p=0.239). Research of Nigeria showed consistent results, however, with the significant impact of socioeconomic status on LOS severity (12).

After determining the maternal factor's impact on LOS severity, in the next and last phase of data analysis, we checked the impact of neonatal factors on LOS severity separately. The frequency of severe LOS was relatively higher among neonates, who had male gender with statistically significant variation (p=0.0001) and it was also detected in another Pakistani research that was conducted in Peshawar (1). Neonates with preterm birth had a greater incidence of severe LOS as compared to neonates with term birth with significant difference (p=0.001) Different studies also displayed similar findings in their results (1), (3). The birth weight impacted LOS severity among neonates significantly (p=0.003) as well and a higher incidence of severe LOS among neonates with low birth weight was noted and this finding was supported by research of United States of America (2). Early cord clamping was also a culprit in increasing LOS severity frequency significantly (p=0.049), while, late cord clamping was protective and this observation was also present in the results of a research that was carried out at United States of America (13). Congenital abnormality had also raised severe LOS frequency significantly (p=0.0001) among neonates according to our study's results and in literature, a study of Taiwan also reported similar findings (14). Breastfeeding was protective against LOS severity while bottle-feeding was found to increase LOS severity significantly (p=0.0001). Research that was conducted at Peshawar, Pakistan also presented the protective role of breastfeeding against LOS (5). Poor feeding hygiene was associated significantly (p=0.002) with the raised frequency of severe LOS. A study of the United States of America also showed that poor feeding hygiene is one of the important risk factors in determining LOS severity (15). The presence of the central catheter

in neonates during their stay at NICU was also linked significantly (p=0.0006) with a higher incidence of severe LOS. American studies also suggested alike role of the central catheter as a culprit in the determination of LOS severity (15), (16).

Our research has provided information that is valuable, about the LOS severity and factors that impact its severity. Maternal factors cause higher LOS incidence because of inadequate measures taken by mothers for infection prevention that lead to transmission of infection to neonates, while, neonatal factors cause an increased prevalence of LOS could be either due to immunity at developing phase means inadequate immunity, or non-hygienic practices for the care of neonates, both of these lead to LOS incidence. Our study has suggested that LOS is affected by various maternal and neonatal factors, so by controlling modifiable factors, we could improve neonates' health and consequently, a decline in mortality of neonates.

Limitations

Although our research has added very significant knowledge regarding the severity of sepsis prevalence and factors that affect it, however, our study had some limitations. One limitation was its cross-sectional design because of it this study could not help us to reach the exact causal relationship between the severity of LOS and factors. The second one included self-designed proforma, which might have led to omitting of some other factors that might affect the severity of LOS. The third one is that we only included neonates with age ranges from 4 to 28 days, although we could add infants as well as the age limit of LOS is 120 days, and inclusion of infants might bring the effect of age in a different way on LOS.

Conclusion

In short, our study has helped us to reach a point where we can say that LOS is impacted significantly by divergent maternal and neonatal factors which consist of mother's education, mother's parity, gender of a neonate, gestational age, birth weight, cord clamping time, congenital abnormality, feeding type, feeding hygiene, and central catheter, while mother's age and socioeconomic status had no statistically significant effect. Hence, by taking specific measures for these factors we could bring a reduction in the incidence of LOS, a decline in LOS severity, and improvement in neonatal mortality. Subsequently a decline in load over limited resources of public sector hospitals and a decrease in burnout among physicians.

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We would like to thanks all the participants of study.

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Original Article

Assessment Of Satisfaction Level Of Students Of Rawalpindi Medical University Attending Online Classes

Malik Shehr Yar[1], Hassan Mumtaz[2], Mehwish Mehmood[3],Syed Muhammad Ismael[4]

[1]*Resident Internal Medicine, Hfh*
[2]*MPH: Health Services Academy, Islamabad*
[3]*Resident Surgeon, Nescom Hospital*
[4]*Dow University Of Health Sciences*

Author's Contribution

[1] Conception of study
[2,4] Experimentation/Study conduction
[3] Analysis/Interpretation/Discussion
[1,3] Manuscript Writing
[2] Critical Review
[3,5] Facilitation and Material analysis

Corresponding Author

Dr. Malik Shehr Yar,
Resident Internal Medicine, HFH
Malikshehryar786@gmail.com

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Abstract

Introduction: Coronavirus, a deadly pathogen, killed hundreds of thousands of people worldwide. It brought revolutionary changes with it, maintaining social distance, wearing a mask, getting vaccinated became a new normal after the pandemic. Moreover, it also ruined medical education and the system had to undergo a transition phase from physical to online classes. Whenever we discuss the education system, it would not be fair to conclude the discussion without knowing students' opinion, are they satisfied or not.

Methodology: In order to find out, we carried out a cross-sectional study at Rawalpindi medical university(RMU), using a preformed Bolliger and halup 2012 survey with additions and modification, 240 participants responded to the survey form, all of the students were undergraduate MBBS students, for analyses SPSS version 24 was used.

Results: The results highlighted that the preferred platform was MS teams. Regarding interaction, communication, collaboration, students were dissatisfied. Students preferred face to face learning over online classes, were not comfortable and overall satisfied with online classes.

Conclusion: In spite of technological advancements, the primitive format of teaching is still the best way, especially in third world countries. There are several barriers that need to be overcome for successful implementation and transition to an online system of education.

Keywords*:* Quality Improvement, medical education, online learning, student satisfaction, faculty satisfaction, health profession education, COVID-19.

Introduction

Pandemic a terrifying word simply means a disease spread over a large area or the whole world. In recent times this word became popular with coronavirus outbreak [1]. Covid-19 virus made history by spreading throughout the world drastically without giving anyone a chance to take any preventive measures. Where it did destroy economies, businesses, several industries, education was also put to halt as social gatherings were strictly prohibited as a measure to flatten the curve [2]. The world had to gather itself and come up with a solution to keep people healthy and alive, and support education and income sources. In order to revive and continue education and secure the future of our youth [3].

E-learning was a suitable alternative which helped students take the lectures and avoid social gatherings remaining safe at their homes. Moreover, it had far reaching impacts on the mental health as it made people psychologically depressed, anxious as they were cut off from the external environment, with media showcasing number of deaths around the globe further filled people with fear which also had an impact on their academic performance [4].

In third world countries like Pakistan there are immense hurdles in the way of e-learning like speed and connectivity issues of the internet, electricity shutdown, lack of environment to name a few [5]. It's a fresh thing to most of the population, people are not introduced to it, so to adapt to the system takes time.

This study was conducted to assess the effectiveness of online classes and whether students are comfortable and satisfied. As student's satisfaction with the kind of education he is getting is necessary to ensure his interest, to keep him engaged, to boost his confidence and to produce the maximum out of him, to check whether these classes are providing a healthy learning environment [6].

It will help to recognize if there is a knowledge gap created by virtual learning, do students need some training sessions to use online platforms fruitfully. This will help evaluate any possible reforms and improvements needed to be made in order to improve learning experience and to enhance students' interest. This will highlight the difficulties in adapting to the e-learning in poor countries and how obstacles can be removed, and virtual learning can be made feasible and accessible [7].

Material and Methods

Faculty at Rawalpindi Medical University (RMU) took immediate steps, came up with a plan and soon shifted the whole physical classes format to virtual learning to minimize the loss of medical students and to start the learning process, virtual classes commenced from September using different platforms like Google or MS teams and zoom. For the assessment of student's satisfaction regarding online setup, a cross-sectional study was done, a pre-validated Bolliger and Halup 2012 survey was used with some modifications and new questions [8]. The online questionnaire was disseminated among MBBS students from 1st till final year of RMU using forums like e-mail and WhatsApp. 240 students voluntarily participated in the survey.

The questionnaire was divided into three parts. Socio-demographics: This section included name, email, year of study, gender, age, and field of study. The second section included yes/no questions and question asking about which platforms were used and preferred by students. The last section of the questionnaire consisted of liker-type questions with option from 1-5, with 1 being strongly disagree and 5 = strongly agreeing. It consisted of questions regarding effectiveness, satisfaction, and implications of virtual learning.

Results were obtained and statistical analysis was done using SPSS version 24. For liker scale questions descriptive analyses was used, and 28 items were encoded with 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree.

To determine the significance and correlation of satisfaction scales, gender and year of study-based differences chi-square test was performed and values of $p<0.05$ were considered significant. A detailed analysis was done, and results are presented in percentages.

Results

240 students responded to the survey form, out of which more than ¾ of the population were

females. Mean age of the students was 20.57. All the participants were MBBS students from first till final year. First years were predominant with 42% of the respondent population, the least number of students were from second year contributing less than 10%. (Refer to table.1)

		N	%
Gender	Male	50	20.7
	Female	189	78.6
Years of study	First year	101	42.1
	Second year	22	9.3
	Third year	51	21.4
	Fourth year	26	10.7
	Fifth year	36	15.0
Age	15	2	0.7
	18-23	219	91.4
	24-28	19	7.9

Table 1. Socio-demographics.

Initially, students were asked about whether university came up with online classes or not, 100% of the population replied positively, when they were asked regarding any prior experience of online classes before the pandemic ¾ replied in affirmation.

Moreover, students were inquired about any training sessions for online classes except for few all of the responses were negative. Students were asked about whether they prefer online or physical classes, majority of the responses were in favor of disagreement. (Refer table 2) Online classes are being conducted through different platforms, students were asked about which platform they prefer 60% of them were in favor of MS teams, 20% in favor of zoom and 11% in favor of Google teams, next they were asked about the platform used by their institute RMU, ¾ of the population replied MS teams, rest were Google teams and zoom.

	Yes N(%)	No N(%)
Have there been any online classes for your batch during covid-19	238(99.3%)	2(0.7%)
Have you had any experience of online classes before covid-19 pandemic	170(70.7%)	70(29.3%)
Were there training sessions regarding online classes	19(7.9%)	221(89.3%)
Do you prefer online classes over physical classes	41(17.1%)	190(79.3%)

Table no .2

Section 3 of the questionnaire consisted of liker scale questions, when the students were asked about interaction with teacher, effective addressing of queries, clear communication about topic, satisfaction with faculty availability, did they felt to be a part of class bulk responses showed strong disagreement. Then comes the assessment of technological implications whether it be communication through email, download durations or connectivity issues a set of balanced reactions were seen. Technical issues caused students to miss classes and there were frequent interruptions in classes on technical grounds. Furthermore, the principal part of the survey contained questions regarding satisfaction based on number of classes, self-directed assignments, quality of interaction, collaboration, level of effort required for online classes, and student feedback highlighted their dissatisfaction.

Questionnaire concluded with the outcome questions like level of understanding, comfortability in participating in online classes, application of the information learnt online, advocate and overall satisfaction of online classes none the less again students were not satisfied as overall the results reflected. Students also felt skill deficient. (Refer table 3)

					SD/D	N	SA/A
		M	SD(n)	N(n)	%(N)	%(N)	%(N)
Instructor	Interaction with teacher was easier online	2.26	81	58	60.7	24.0	15.0
	All your queries addressed more effectively during online teaching	2.25	67	50	65.0	21.0	13.6
	There was clear communication about topic and assignment	2.49	67	50	53.6	21.0	25.7
	I am satisfied with faculty availability and accessibility	2.51	120	65	50.0	27.0	22.9
	I felt to be the part of class and belonged to the online session.	2.28	33	41	61.4	17.0	21.5
technology	I am satisfied with online communication including email and announcements	3.01	41	51	36.4	21.4	42.1

	I am satisfied with the download duration of the content shared	2.89	41	60	37.4	25.0	37.1
	I have internet and connectivity issues at home so difficult to attend online classes.	2.88	43	41	47.1	17.1	35.7
Setup	Missed classes due to technical faults	3.41	26	50	25.7	21.0	53.6
	Time taken by download material was longer and it made you irritated	3.25	21	70	27.1	29.3	43.5
	Were there frequent break during online session due to technical issue	3.18	33	58	30.7	24.3	45.0
implications	It has financial implications due to family's financial condition	2.19	84	39	67.9	16.4	15.7
	Staying on screen for a long time was difficult	4.11	14	19	13.6	7.9	78.5

satisfaction	I am satisfied with the number of online sessions/teaching hours	2.59	63	57	51.4	23.6	30.7
	I am satisfied with self -directed assignments	2.61	48	60	49.3	25.0	25.7
	I am satisfied with the quality of interaction between me and faculty	2.39	60	67	55.0	27.9	17.1
	I am satisfied with collaborative activities during online learning	2.18	69	63	63.6	26.4	10.0
	I am satisfied with the level of effort during online classes	2.58	60	56	49.3	23.6	27.1
others	Online session offered flexible timings for classes	2.38	63	56	58.6	23.6	17.9
	I enjoyed working on projects assigned online	2.38	62	67	55.7	27.9	16.5
Overall outcomes	I can relate to level of understanding with other students	2.40	58	56	57.1	23.6	19.2

	I am comfortable with participating in online classes	2.59	62	43	52.1	17.9	30.0
	I am able to apply what I learnt during online classes	2.40	67	60	55.0	25.0	20.0
	I felt skill deficiency as compared to physical classes	3.94	26	26	15.0	10.7	74.3
	I will recommend online classes to others	1.96	115	48	70.7	20.0	9.3
	I am satisfied with online learning as compared to face to face	1.91	125	31	74.2	12.9	12.9
	My level of satisfaction encourages me to advocate online classes	1.91	120	41	72.9	17.1	10.0
	Overall I am satisfied with online classes at my institute	2.33	87	53	56.4	22.1	21.4

Table no.3 SD= strongly disagree, D=disagree, N=neutral, SA=strongly agree, A=agree.

Significant association can be seen between gender and their preferences for learning as majority of the females disagreed when asked if they would prefer online classes over in-person classes while majority of the males agreed with it.

A substantial number of females disagreed on recommending virtual classes to others while the majority of the males agreed to it, proving its association with the gender. (Refer table 4)

parameters	Gender				p
	Male		Female		
	Disagree N(%)	Agree N(%)	Disagree N(%)	Agree N(%)	
Quality of					

interaction during online classes	20(8.6%)	29(12.1%)	111(46.4%)	77(32.1%)	0.12
Did you feel skill deficient during online classes	3(1.4%)	46(19.0%)	33(13.6%)	156(65.0%)	0.34
Would you prefer online classes over face to face learning	26(10.7%)	24(10.0%)	153(63.6%)	36(15.0%)	0.001
Would you recommend online classes to others	27(11.4%)	22(9.3%)	142(59.3%)	46(19.3%)	0.03
Overall were you satisfied with online classes	24(10.0%)	26(10.7%)	110(45.7%)	79(32.9%)	0.43

Table no. 4 cross-tabulation of gender

Insignificant association can be seen between year of study and choices regarding interaction, skill deficiency, preference of online classes over face-to-face learning and overall satisfaction because the trends in responses from each year were more
or less the same so there is no significant difference. (Refer table 5).

Parameter	Years of study										p
	1st		2nd		3rd		4th		5th		
	Agree N(%)	Disagree N(%)	Agree N(%)	Disagree N(%)	Agree N(%)	Disagree N(%)	Agree N(%)	Disagree N(%)	Agree N(%)	Disagree N(%)	
Quality of interaction during online classes	48(20.0%)	53(22.1%)	86(3.6%)	14(5.7%)	26(10.7%)	26(10.7%)	9(3.6%)	17(7.1%)	15(6.4%)	21(8.6%)	0.73
Did you feel skill deficient during online classes	84(35.0%)	17(7.1%)	22(9.3%)	0(0.0%)	28(20.0%)	3(1.4%)	21(8.6%)	5(2.1%)	27(11.4%)	9(3.6%)	0.07
Would you prefer online	24(10.0%)	77(32.1%)	7(2.9%)	15(6.4%)	17(7.1%)	34(14.3%)	3(1.4%)	22(9.3%)	10(4.3%)	26(10.7%)	0.78

classes over face to face learning											
Would you recommend online classes to others	27(11.4%)	74(30.7%)	7(2.9%)	15(6.4%)	17(7.1%)	34(14.3%)	3(1.4%)	22(9.3%)	15(6.4%)	21(8.6%)	0.55
Overall were you satisfied with online classes	53(22.1%)	48(20.0%)	7(2.9%)	15(6.4%)	17(7.1%)	34(14.3%)	10(4.3%)	15(6.4%)	17(7.1%)	19(7.8%)	0.44

Table no. 5 cross-tabulation year of study

Discussion

Online learning is adapted throughout the world due to Covid19 SOP's. And to assess students' satisfaction we conducted this study. At RMU MS teams were used as a mode of teaching, and the majority of students preferred MS teams, while in another study it was reported that zoom was the popular platform among students [9].

In this study, overall males were more satisfied with online learning than females, and it is contrary to what was highlighted in another study which indicates that females were more satisfied with e-learning [10].

When it comes to preference of e-learning over face-to-face learning, majority students were in favor of face-to-face learning, and the identical thing is being reported by study conducted in Switzerland [11]. Private and public sector universities differ in standards and have a better quality of environment, but the students there also did not prefer online learning [12].

This study revealed that students felt skill deficient and less productive and there are plenty of factors contributing to it, psychological AND social anxiety is one of the leading cause that led to downfall of skills among students [13,14].

Having a knowledge of student's satisfaction regarding mode of learning is an essential tool for the betterment of students and faculty, this makes this study of immense importance [15]. Our study didn't take into account the post-graduate and sub specialty students, they were also on the receiving end, as professional exams were canceled, clinics were rescheduled, leading to waste of time and disturbing mental health [16].

There are far greater challenges to online learning than highlighted in this study, internet instability, electric shutdowns, availability of a smartphone or laptop, financial implications, staying on screen for long time periods causes problems, lack of awareness and training, designing of content etc [17,18]. Furthermore, living in a developed country can reduce certain difficulties as those countries and well-facilitate, with a better quality of time, but still cannot compensate for the face to face learning.

When it comes to overall satisfaction of students, faculty plays a pivotal role. Because teachers pave the path for students by boosting their confidence, encouraging, and engaging them in productive

activities, giving them advice, beneficial for carving a bright future. So, one of the key reasons behind student's dissatisfaction with online learning. Though there was online interaction with teachers, but it was also difficult for teachers to control the class, manage workload and convey the message properly [19]. Therefore for the success of the virtual education system, training sessions should be organized for both teachers and students [20]. It is a very vast topic and taking into account every possible thing is almost next to impossible.

Strengths and Difficulties

This study highlights student's perspective regarding online, it is conducted in a public sector university of a developing country so it will enlighten us with the problems and difficulties in the way of virtual learning. Our study did not included students in other faculties and faculty members. It also didn't take into account the psycho-social factors of covid19.

Conclusion

After a thorough analysis of the results and literature review it can be concluded that covid19 pandemic brought many changes to daily lives, and medical education is no exception. Virtual education came up with a great alternative as education continued during tough times, but world is adapting to it gradually and more research is required to improve the experience of online learning.

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Original Article

Incidence of Neonatal Jaundice and its Determinants: A Hospitals based Cross-Sectional Study

Tayyab Mumtaz Khan[1], Zartasha Qayyum[2], Yumnah Anwar[3], Kaiynat Maqsood[4,]Malik Shehr Yar[5],Bilal Sharif[6]

[1]*BSC, MBBS, House Officer, Rawalpindi Medical University and Allied Hospitals, Rawalpindi.*

[2,3,4,5]*House Officer, Rawalpindi Medical University and Allied Hospitals, Rawalpindi.*

[6]*MBBS, Post Graduate Trainee, Medicine Department, Holy Family Hospital, Rawalpindi.*

Author's Contribution

[1] *Conception of study*
[2,4] *Experimentation/Study conduction*
[1,3] *Analysis/Interpretation/Discussion*
[1,2,4] *Manuscript Writing*
[4,5] *Critical Review*
[3,5,6] *Facilitation and Material analysis*

Corresponding Author

Dr. Tayyab Mumtaz Khan
House Officer,
Rawalpindi Medical University and Allied Hospitals,
Rawalpindi
Email: tayyab.mkhan98@gmail.com

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Abstract

Background: Jaundice is one of the major reasons for which neonates come to hospitals. Jaundice is characterized by yellow discoloration of skin and sclera along with associated symptoms and signs which include fever, poor feeding, and lethargy among patients. Jaundice is affected by various maternal and neonatal risk factors, however, they are understudied in our region.

Objectives: our study was carried out to evaluate the incidence of neonatal jaundice and factors that impact it.

Material and Methods: This comparative cross-sectional study was conducted among neonates in tertiary care hospitals of the Rawalpindi, from May 2021 to August 2021. The sample size of the study population was 307 and participants were enrolled in study via the established standards of inclusion and exclusion along with nonprobability convenient sampling. Data was collected after taking informed consent. Data analysis was done through descriptive and inferential statistics via the Chi-Square test. P-value less than 0.05 was set significant.

Results: The Incidence of Neonatal jaundice in our study population was 29.70%. Neonatal jaundice was impacted by neonatal factors significantly by gender (p=0.01), gestational age (p=0.008), birth weight (p=0.003), sepsis (p=0.02), hypothermia (p=0.03), and cord clamping (0.05). Likewise, maternal factors were also linked with neonatal Jaundice significantly, and these included maternal age (p=0.0001), breastfeeding frequency (p=0.008), gestational diabetes (p=0.002), hypertension (p=0.001), premature rupture of membrane (p=0.003), and blood incompatibility (p=0.0003)

Conclusion: In brief, neonatal jaundice is affected by both neonatal and maternal factors. Addressing these factors can decrease hyperbilirubinemia-related neonatal morbidity and mortality.

Keywords: *Incidence, Neonatal, Jaundice, Determinants, Hospital, Cross-sectional*

Introduction

Neonatal jaundice is a physiological event in babies that occurs in almost more than half of the term and 80% of preterm newborns and presents with yellowish staining of the skin, conjunctiva, and the sclera (1), (2). Jaundice can also be an indication of an illness that results in raised serum or plasma bilirubin levels (3). This is an aftereffect of the increased breakdown of red cells or diminished hepatic discharge of bilirubin causing an irregularity between bilirubin synthesis and conjugation, which brings about raised bilirubin levels (2), (4). Jaundice is usually seen in newborns when the concentration of bilirubin reaches 5 mg/dL (1), (5).

Jaundice on the primary day of life is consistently pathologic, and dire consideration is expected to discover its causes. Jaundice in most cases is because of hemolysis and infection (7). Physiological hyperbilirubinemia usually appears after the 1st 24 hours and within two weeks. Although it gets settled with the development of the liver of neonates, however, it is still one of the most widely recognized reasons for hospitalization of the term and preterm newborn children in neonatal clinics (8), (9). There is an essential concern related to jaundice because of the association between raised levels of unconjugated bilirubin and neurotoxic impacts causing long-term sequelae including cerebral palsy, hearing loss, and kernicterus (10).

Neonatal jaundice is affected by multiple factors, which include both neonatal and maternal factors. Neonatal factors include neonatal gender, gestational age, birth weight, sepsis, hypothermia, and cord clamping (7), (11), (12). The maternal factors comprised maternal age, breastfeeding frequency, gestational diabetes, hypertension, premature rupture of membranes, and blood incompatibility (13), (14), (15). Identification of these factors can facilitate early diagnosis, and provide a better prognosis.

Despite various researches that have been conducted all over the world to assess the incidence of neonatal jaundice and its risk factors, the latest researches regarding neonatal jaundice and factors affecting it are few, therefore, in the presence of few or absence of new studies that could explain new neonatal incidence and factors affecting it, our study aims to determine the current frequency of neonatal jaundice and risk factors for it. Identification of incidence of neonatal jaundice and factors that determine it would help in the prevention of complications of neonatal jaundice like cerebral palsy and kernicterus. This would subsequently lead to a decrease in load on limited resources of public sector hospitals and a decline in burnout among physicians.

Materials and Methods

We carried out this descriptive Cross-Sectional study in neonatal units of allied hospitals of Rawalpindi Medical University (RMU) Rawalpindi, Pakistan from May 2021 to August 2021 among neonates who were admitted with any of the following complaints .i.e. fever, poor feeding, lethargy, vomiting, and yellow discoloration of skin or sclera. Serum bilirubin analysis was also performed of all babies to rule out neonatal jaundice. The Study population size was determined through the WHO calculator and it was 307 with a confidence interval of 95%. We selected the research population by nonprobability convenient sampling and through established inclusion and exclusion criteria. Neonates with the age range between 4 to 28 days were taken in the study while age under 4 days and more than 28 or had any congenital abnormality, were excluded from the study. Information was taken through self-designed proforma, before the start of information assortment, we took informed consent from the guardians or parents of the neonates, and the objectives of the research were disclosed to them. Proforma had two segments, first was composed of neonatal information related to demographics and neonatal risk factors for jaundice. Neonatal information included, age in days, gender (male or female), gestational age (Before 37 week= Preterm while from 37 to 42 weeks = Term), birth weight (Low birth weight= less than 2.5kg, whereas 2.5kg to 4.5kg =Normal weight), sepsis (clinical picture which included fever, lethargy, irritability, feeding difficulty, tachycardia, tachypnea, nasal flaring, chest or substernal retraction, and

cyanosis along with lab findings like C- reactive proteins more than 10mg per L, Total leucocyte count more than 30,000/mm^3 or less than 4000/mm^3, platelets less than 100,000/mm) hypothermia (temperature less than 97.7F), and cord clamping (Early within 1 minute of birth whereas, Late means after 5 minutes of birth), while, jaundice itself was based on serum bilirubin level (Yes or No on the basis of serum bilirubin levels and serum bilirubin level more than 5mg/dL, or 86 µmol/dL was an indicator of the presence of jaundice). Clinical findings and investigation findings that had been used for the diagnosis of sepsis and jaundice in this study have already been used in other researches as well (5), (6). Second, part of proforma was about maternal risk factors that impact neonatal jaundice among neonates, and these included, maternal age (Younger = age less than 30 years, Elder= age more than 30years), gestational diabetes (Yes or No), hypertension (Yes or No), premature rupture of membrane (PROM) (Yes or No), blood ABO or Rh incompatibility between mothers and neonates (Yes or No), and breastfeeding frequency at birth of the baby (Normal=more than 8 times per day or Decreased =less than 8times per day). After the collection of all relevant information, we entered data into IMB SPSS version 25 and performed the analysis of it. We applied descriptive and inferential statistics in our study. First descriptive statistics were utilized to measure quantitative factors then inferential statistics were put into action through the Chi-Square test to know that either, included maternal and neonatal factors were associated or not with neonatal jaundice. The value of p under 0.05 was set as genuinely significant.

Results

Out of 307 participants in this study, 165 (53.70%) neonates had male gender, while 142 (46.30%) neonates had female gender. Regarding the incidence of neonatal jaundice, in our study population 217 (70.68%) neonates did not have jaundice while 90 (29.32%) neonates had jaundice. The means of various included quantitative variables like gestational age, age, birth weight, and serum total bilirubin were, 39 weeks, 15 days, 3.4k g, and 8.9 mg/dL respectively.

Figure I shows the percentage of neonates who had neonatal jaundice, along with the percentage of neonates who did not have jaundice.

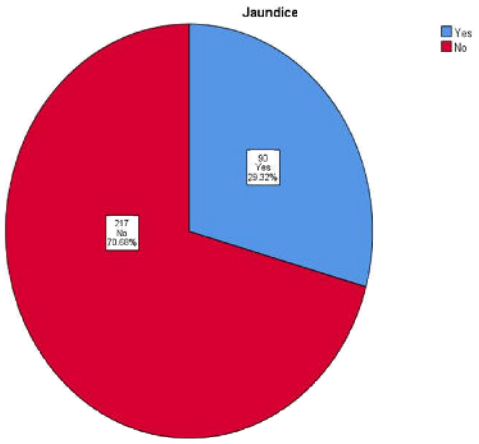

Figure I shows the percentage wise division of study population based on presence or absence of jaundice.

Table I highlights that gender, gestational age, birth weight, sepsis, hypothermia, and cord clamping timing significantly influence the incidence of neonatal jaundice. The incidence of neonatal jaundice was higher among neonates who had male gender, preterm birth, low birth weight, hypothermia, and late cord clamping in contrast to neonates who had female gender, term birth, normal birth weight, normal temperature, and early cord clamping.

Table Ⅰ : Incidence of Neonatal Jaundice and Neonatal Factors influencing it.

Parameter		Neonatal Jaundice		Chi- Square
		Yes	No	
Total=307		90 (29.32%)	217 (70.68%)	P- value
Gender	Male N=165 (53.70%)	69 (41.82%)	96 (58.18%)	0.01
	Female N=142 (46.30%)	21 (14.78%)	121 (85.22%)	
Gestational Age	Term N=171 (55.70%)	33 (19.30%)	138 (80.70%)	0.008
	Preterm N=136 (44.30%)	57 (41.91%)	79 (58.09%)	
Birth Weight	Normal N=186 (60.60%)	36 (19.35%)	150 (80.65%)	0.003
	Low N=121 (39.40%)	54 (44.62%)	67 (55.38%)	
Sepsis	Absent N=214 (69.70%)	33 (15.42%)	181 (84.58%)	0.02
	Present N=93 (30.30%)	57 (61.29%)	36 (38.71%)	
Hypothermia	Absent N=256 (83.40%)	63 (24.61%)	193 (75.39%)	0.03
	Present N=51 (16.60%)	27 (52.94%)	24 (47.06%)	
Cord Clamping	Early N=223 (72.6%)	45 (20.18%)	178 (79.82%)	0.05
	Late N=84 (27.40%)	45 (53.57%)	39 (46.43%)	

Table Ⅱ manifests that the impact of maternal factors which include of mother's age, breastfeeding frequency, gestational diabetes, hypertension, premature rupture of membrane, and blood incompatibility on neonatal jaundice is significant statistically. Neonatal jaundice incidence was higher among neonates whose mothers had old age, reduced breastfeeding frequency to their babies at birth, gestational diabetes, hypertension, premature rupture of membrane, and blood incompatibility, in comparison with neonates whose mothers had young age, normal breastfeeding frequency to their babies

at birth, absence of gestational diabetes, normotensive, no premature rupture membrane, and no blood incompatibility.

Table Ⅱ: Incidence of Neonatal Jaundice and Maternal Factors influencing it.

Parameter		Neonatal Jaundice		Chi- Square
		Present	Absent	P- value
Total=307		90 (29.32%)	217 (70.68%)	
Age of Mother	Younger N=206 (67.10%)	45 (21.84%)	161 (78.16%)	0.0001
	Older N=101 (32.90%)	45 (44.55%)	56 (55.45%)	
Breastfeeding Frequency	Normal N=171 (55.70%)	9 (5.27%)	162 (94.73%)	0.008
	Reduced N=136 (44.30%)	81 (59.55%)	55 (40.45%)	
Gestational Diabetes	Absent N=233 (75.90%)	57 (24.47%)	176 (75.53%)	0.002
	Present N=74 (24.10%)	33 (44.59%)	41 (55.41%)	
Hypertension	Absent N=220 (71.10%)	35 (15.91%)	185 (84.09%)	0.001
	Present N=87 (28.30%)	77 (88.51%)	10 (11.49%)	
Premature Rupture of Membrane	No N=205 (66.80%)	71 (34.64%)	134 (65.36%)	0.003
	Yes N=102 (33.20%)	19 (18.63%)	83 (81.37%)	
Blood Incompatibility	Absent N=219 (71.30%)	45 (20.55%)	174 (79.45%)	0.0003
	Present N=88 (28.70%)	45 (51.14%)	43 (48.86%)	

Discussion

Our study presented very useful information regarding Neonatal Jaundice and its determinants that are related to neonates and mothers.

Before the evaluation of the association between neonatal jaundice and included factors in research, we assessed the incidence of jaundice among the study population based on serum bilirubin level along with clinical symptoms and signs like yellow discoloration of skin and sclera, fever, lethargy, irritability, and poor feeding or decreased feeding, and it was 29.7%. Various studies have used serum bilirubin levels for the diagnosis of neonatal jaundice all over the world along with clinical pictures (1), (5). Another Pakistani study has reported an almost similar incidence of the prevalence of neonatal jaundice as our study presented (1).

In the next step of data analysis, we applied Chi-Square analysis to check that which factors impact neonatal jaundice incidence significantly and which factors do not influence it significantly. In this step of data analysis, first, we assessed the association of neonatal factors with the incidence of neonatal jaundice and then maternal factors related to the incidence of neonatal jaundice.

We found that all listed neonatal factors which included their gender (p=0.01), gestational age(p=0.008), birth weight(p=0.003), sepsis(p=0.02), hypothermia (p=0.03), and cord clamping(p=0.05), were significantly associated with the incidence of neonatal jaundice. Incidence of neonatal jaundice was higher among the neonates who had male gender, preterm birth, low birth weight, sepsis, hypothermia, and late cord clamping. Different Pakistani studies and one Nepali study proposed similar findings and showed higher incidences of jaundice among neonates who had male gender, preterm, low birth weight, sepsis, hypothermia, and late cord clamping in contrast to neonates who had female gender, term birth, normal birth weight, no sepsis, normothermic, and early cord clamping (1), (11), (12).

Subsequently, we noted that all enlisted maternal factors which consisted of their mother's age (p=0.0001), breastfeeding frequency (p=0.008), gestational diabetes (p=0.002), hypertension (p=0.001.), premature rupture of membrane (p=0.003), and blood incompatibility (p=0.0003), were significantly linked with the incidence of neonatal jaundice. Incidence of neonatal jaundice was higher among the neonates whose mothers had old age, reduced breast frequency, gestational diabetes, hypertension, premature rupture of membrane, and blood incompatibility in contrast to neonates whose mothers had young age, normal breastfeeding frequency, no gestational diabetes, normotensive, no premature rupture of membrane, and no blood incompatibility. Various researches that were conducted in different countries including Iran, Sweden, and India reported findings in their results that support the findings of our study (13), (14), (15), (16), (17).

.This study has provided the latest knowledge regarding the incidence of neonatal jaundice and some of the factors that impact it. Community and health authorities should emphasize on prevention of factors that determine neonatal jaundice prevalence so that morbidity and mortality associated with neonatal jaundice can be prevented. Moreover, by this strategy, the burden on limited resources of public sector hospitals of developing counties like Pakistan would be reduced.

Limitations

Even though this study has highlighted the recent incidence of neonatal jaundice and factors affecting it, however, this study has some limitations as well. These limitations are because of the self-designed proforma that we used in the study and its cross-sectional study type. Self-designed proforma might have led us to miss some other important risk factors of neonatal jaundice and because of the cross-sectional nature of the study we might have missed the real causal relationship between neonatal Jaundice and included risk factors. Furthermore, we have not studied the cause of jaundice that either jaundice is physiological or pathological. Therefore, further studies are required to explore the association of risk factors with an underlying cause of neonatal jaundice.

Conclusion

Our study suggests an overall high incidence of neonatal jaundice among neonates who were admitted in neonatal units of allied hospitals of RMU, and it's influenced by various neonatal and maternal factors. List of these neonatal factors includes neonatal gender, gestational age, birth weight, sepsis, hypothermia, and cord clamping. The maternal factors are the mothers' age, breastfeeding frequency at birth, gestational diabetes, hypertension, premature rupture of membrane, and blood incompatibility. Health authorities along with parents should take steps that could prevent preventable risk factors so that we could prevent the lethal and permanent consequences of neonatal jaundice like kernicterus and cerebral palsy.

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Original Article

In Vitro Fertilization by Intracytoplasmic Sperm Injection; Outcomes of Micro-Dose Flare-Up, Gnrh Antagonist, And Long Protocols In Patients With A Poor Ovarian Response

Hassan Mumtaz[1], Afifa Akbar Ali[2], Hamza Amin[3], Shahzaib Ahmed[4], Ayesha Saqib[5], Faiza Tabassum[6], Hamza Ehsan[7], Hamza Naeem[8], Hadin Darian Khan[9], Muhammad Abu Bakar Shahid Chishti[10]

1. *House physivian, KRL Hospital Islamabad, Pakistan*
2. *Afifa Akbar Ali Resident Gynaecologist, HFH*
3. *Doctor of Physical therapy (DPT) Foundation university Islamabad (FUI)*
4. *King Edward Medical University Lahore, Pakistan*
5. *Doctor of Physical Therapy Foundation University Islamabad*
6. *Doctor of Physical Therapy (FUI)*
7. *Doctor of Physical Therapy (FUI)*
8. *House Officer Mayo Hospital Lahore*
9. *Shalamar Medical and Dental College Lahore*
10. *King Edward Medical University Lahore*

.

Author's Contribution

[1,2] Conception of study
[3,5] Experimentation/Study conduction
[4] Analysis/Interpretation/Discussion
[7] Manuscript Writing
[8,9] Critical Review
[6] Facilitation and Material analysis

Corresponding Author

Dr Shahzaib Ahmad[2], King Edward Medical University Lahore, Pakistan; shahzaib.ahmad@kemu.edu.pk;

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Abstract

Introduction: In vitro fertilisation utilises a variety of techniques. After their first IVF cycle, those who were treated with micro-dosing or GnRH antagonist protocols, which were thought to be ineffective, will be compared to people who were treated with lengthy GnRH protocols and had poor ovarian responses and low IVF cycle egg yields.

Materials and Methods: A retrospective cohort study was carried out by KRL Hospital's Obstetrics and Gynecology Department from September 2014 to February 2019. It was determined that patients who were treated with IVF's first cycle and found to be poor responders after ovarian stimulation needed micro-dose flare-up (Group 1), GnRH antagonist (Group 2), and prolonged GnRH agonist (Group 3). (Group 3: 77 patients).

Results: The basal FSH levels in Group 3 were much lower than those in the other groups (p0.05). Metaphase II oocyte counts were similar across the groups 1, 2; however, the mean AFC of the group 3 was much higher than that of either of the other groups (p0.05). Group 3 had greater clinical pregnancy rates than groups 1 and 2 (22,9% vs. 13-7%) and 14-44 percent, however the difference was not statistically significant. The live birth rate in Group 3 was considerably greater than in the other groups (21.4 percent) (9.7 percent and 10.3 percent , respectively; p0.05).

Conclusion: Poor responders undergoing IVF may have the option of a long protocol. The presence of ovarian reserve markers is critical for the success of IVF in women who have had difficulty conceiving naturally.

Key Words: Poor responder, micro-dose flare-up, GnRH antagonist, long protocol, IVF, pregnancy outcomes

Introduction

There are many ovarian stimulation protocols discussed during IVF. There have been many studies that connect the use of ART to more cycles failing to respond to ovarian stimulation (OS) treatments (ART). 9 to 24% of individuals receiving IVF treatment have trouble tolerating OS [1.]. POR, or "poor ovarian response," may refer to a number of different medical conditions. Human Reproduction and Embryology experts agree that POR occurs when two of the three conditions listed below are met (ESHRE). In the past, you've had an abnormal ovarian reserve test, such as an AFC count of 5–7 follicles or an AMH level of 0.5–1.1 ng/ml (Anti-Mullerian Hormone), which may indicate POR. Let me give you two concrete instances to better understand: (2). POSEIDON classification (Patient-Oriented Strategies Encompassing Individualized Oocyte Number) has recently been proposed as a method to identify patients who are poor responders to treatment. These four categories are further divided based on the ovarian reserve features (AFC 5 or AMH 1,2 or 1,2) and the amount of retrieved oocytes after regular stimulation (3).

POR may be improved by using various ART therapy plans. There are a number of stimulation regimens and adjuncts (such as DHEA, Growth hormone, and others) available if the patient has a poor response. However, none of them are as effective or superior in terms of evidence-based research as GnRH agonist and antagonist. (4). Endogen gonadotropin suppression without inhibiting hypophysis and the first flare-up of endogen gonadotropins is theoretically advantageous for the antagonist treatment since it results in greater recruiting of follicles (6). The lengthy therapy is not universally accepted by specialists, however, since it improves follicular synchronisation in individuals who have had a poor response (7).

GnRH antagonist therapy is often used to treat postoperative rhinitis (8). NOR was greater with the antagonist protocol than with prolonged treatment, while NOR was lower with flare-up protocol, according to a Cochrane study of various OS techniques in poor responders (9). Previous Cochrane reviews have shown that lengthy protocols had greater rates of both CPR and NOR than short procedures (10). Further randomised controlled studies (RCS) showed similar findings on the NOR between long and short treatments (11). This lack of solid data makes it difficult to decide which treatment regimen is best for patients who have had a poor response to previous treatments. (9). These regimens cannot be advised due to a lack of evidence, since POR is defined differently according on the nation in which the patient resides. An enormous amount of past study examined how well the three primary treatment methods performed for various patient groups on a binary basis.

Consequently, we aimed at comparing outcomes between the outcomes of patients who had been stimulated with a long GnRH protocol in their first cycle and had a poor response to gonadotropins, as well as the outcomes of patients who were treated with a micro-dose or antagonist protocol in their first cycle and were presumptively low responders before stimulation.

Material and Methods

From September 2014 to February 2019, the Obstetrics and Gynecology Department performed a retrospective research. There's no such thing as an ethics committee at a university. Looking into whether or if there were underlying health problems in women who applied to the clinic and subsequently began IVF treatment was something we did. There were no abnormalities seen in the men's sperm counts, motility, or ejaculatory function. If this is the case, they are no longer included. People were divided into three groups based on their IVF technique using micro-dose GnRH antagonist (Group 2) and extended GnRH agonist (Group 1). (Group 3).

There was a research done on those who were anticipated to be poor responders due to their age, baseline FSH or AFC that looked at how they reacted. After ovarian stimulation, all patients in the first group received a micro-dose of clomiphene citrate, whereas those in the second group received an antagonist regimen. A long-acting luteal GnRH-agonist was administered to patients in the control group if their first IVF cycle had poor egg yields, or if

they were older, had low baseline FSH, or had AFC. After stimulation, the NOR 5 levels were increased in all participants in the long-agonist group (Group 3). If a patient's cycle produced more than 5 oocytes, their study eligibility was revoked. Endocrine diseases such as polycystic ovarian syndrome, hypothyroidism or hyperprolactinemia and severe male factor infertility were also eliminated..

There were only two groups present: group 1 began taking a modest dosage of OC for 21 days on the first day of the previous cycle (Desolett; Organon, Netherlands). At 80 grammes per day, the patient started taking leuprolide acetate (Lucrin; Abbott, France) on the second day of menstruation. She was then reduced to 40 grammes SC twice daily as maintenance. On the third day of the cycle, the patients received 300-450 IU/day of recombinant FSH (Gonal-F; Serono, Turkey). Prior to receiving hCG, patients got leuprolide acetate and recombinant FSH.

To begin the third day of the cycle, individuals in Group 2 were administered Recombinant FSH 300–450 IU/day, and daily cetrorelix 0.25 mg/day (Cetrotide; Asta Medica, Germany) until hCG injections were given.

When the pituitary suppression was verified (E2 level 50 pg/ml) during the mid-luteal phase of the previous cycle, leuprolide acetate (1 mg) was administered to begin the phase and end it. Later, the dosage of recombinant FSH was increased to 300–450 IU/day, and the dose of leuprolide acetate was cut in half (0.5 mg). It was necessary to have the recombinant FSH and leuprolide acetate on hand right up until the hCG injection was given. After then, they were thrown away.

The dosage of gonadotropin was fine-tuned based on blood E2 levels and serial ultrasound evaluations of follicle growth in response to the ovaries' stimulatory behaviour. The Voluson 730 Pro equipment was used for all of the sonographic testing (GE Healthcare Austria GmbH & Co OG). As soon as ultrasonography showed the largest leading follicles with an average diameter of 17-18 mm, the patient was administered 250 micrograms of choriogonadotropin alfa (Ovitrelle, Merc Serono, Italy) in an effort to encourage ovulation. The hCG injection was given 36 hours before the transvaginal oocyte retrieval procedure. There were no retrieval failures when ISCI was applied to all of the metaphase II oocytes. For high-quality or excellent embryos, a flexible catheter was utilised with equal blastomere and 20 percent cytoplasmic fragmentation under transabdominal ultrasound monitoring (grade I [high-quality]: embryos with no cytoplasmic fragmentation; grade II [good-quality]: embryos with 20 percent cytoplasmic fragmentation). Two to three days had passed since the oocyte retrieval procedure (Wallace; Irvine Scientific, Santa Ana, CA).

Prior to the transfer, patients received luteal phase support and vaginal progesterone (P) supplementation (Crinone 8 percent gel, Serono). Ultrasonography was used to detect a clinical pregnancy when a gestational sac or a developing foetus showed signs of cardiac activity. When a viable foetus is born before the 23rd week of pregnancy, it is called a live birth. The primary outcome measures in this research were the live birth rates (LBR) per patient and the use of cardiopulmonary resuscitation (CPR) (CPR). Aside from it, secondary outcomes were the number of mature oocytes, NOR, and estradiol levels one day after the hCG injection. The fertilisation rate was calculated by comparing the number of fertilised oocytes with the total number of mature oocytes collected. Data was analysed using SPSS, a social science statistical software programme (SPSS, version 21.0, Statistics, 2013, Chicago, IBM, USA). In data studies based on normal distribution, normality tests such as the Kolmogorov-Smirnov test were used. The mean values of the stimulation protocol groups were compared using one-way analyses of variance (One-way ANOVA) and the Bonferroni post hoc test. Discrepancies between analysed categorical data sets were searched for using the Chi-square test. To compare fertilisation rates, researchers used the chi-square test. For categorical data, we utilised percentages, whereas for continuous variables, we used mean standard deviation. p0.05 was chosen as the level of statistical significance.

Results

This research included 318 patients in all. One hundred and thirty-six patients (42.8 percent) were assigned to Group 1, 105 (33.3 percent) to Group 2, and 77 (24.2 percent) to Group 3. Group features are presented on a granular level in table 1. There was no difference in the average age across the groups. The BMIs of the groups were similar, and neither was the length of time the women had been trying to conceive nor the reasons of their infertility. Group 3 had substantially greater mean AFC (5.5 1.9) than groups 1 (4.8 1.7) and 2 (4.7 2.0) (p0.05), while group 3 had significantly lower mean baseline FSH levels (7.8 2.7) than groups 1 and 2 (9.3 3.9, 9.7 4.6, respectively) (p0.05)

Table 1. Comparison of basal characteristics of patients between groups

Variables (318 patients)	**Group 1 (Micro-dose) [1] (n=136)**	**Group 2 (Antagonist) [2] (n=105)**	**Group 3 (Long agonist) [3] (n=77)**	***p-value***
Age (year)	36.4 ± 4.3	36.1 ± 5.3	35.1 ± 3.5	O.13O
Duration of infertility (month)	107.7 ± 68.5	96.5 ± 71.3	100.2 ± 62.5	O.436
Basal FSH (mIU/ml)	9.3 ± 3.9 [3]	9.7 ± 4.6 [3]	7.8 ± 2.7 [1,2]	O.OO9
Antral follicle count	4.8 ± 1.7 [3]	4.7 ± 2.0 [3]	5.5 ± 1.9 [1,2]	O.OO5
BMI (kg/m²)	23.1 ± 2.3	22.7 ± 2.7	23.2 ± 2.5	O.345
Causes of infertility	n (%)			O.214
Mild male factor	47 (34.6)	27 (25.7)	29 (37.7)	
Unexplained	52 (38.2)	53 (50.5)	37 (48.1)	
Tubal	22 (16.2)	16 (15.2)	7 (9.1)	
Mixed	15 (11)	9 (8.6)	4 (5.2)	

The results were shown as the average standard deviation (SD) and as a percentage (percent). BMI stands for body mass index, while FSH stands for follicle-stimulating hormone. A p-value of 0.05 was deemed significant when differences between groups were shown with a Superscript (n).

Table 2 shows the differences in ovarian stimulation parameters between the two groups. Both groups had comparable stimulation durations, progesterone and LH levels on the trigger day, and these results hold true throughout the whole study. A greater total dosage of gonadotropins was taken by patients in group 1 than in group 3 (3714.71120.7) (p0.05). Group 3 had substantially higher mean estradiol levels on the day of the hCG trigger (1148.0 546.7) than just group 2 (933.9 427.3) (p0.05). Between groups, there were no differences in mean endometrial thickness, number of follicles less than 17 mm in diameter, or cycle cancellation rates. NOR was comparable between groups, as were the quantity of metaphase II oocytes and the number of transplanted embryos. The ovum collection process in groups went well with no complications. p=0.645) found no difference in fertility rates across the three groups (70,6%, 69%, and 67%).

Table 2. Comparison of ovarian stimulation results and pregnancy outcomes between groups				
Variables (318 patients)	**Group 1 (Micro-dose) (1) (n=136)**	**Group 2 (Antagonist) (2) (n=105)**	**Group 3 (Long agonist) (3 (n=77)**	***p-value***
Duration of stimulation (day)	11.5 ± 1.9	11.O ±2.5 (1)	10.8 ± 2.1	O.O54
Total dose of gonadotropin(IU)	4189.5 ± 1252.7 (3)	3994.1 ± 1397.9	3714.7 ± 1120.7 (1)	O.O33
E2 level on hCG day (pg/ml)	1O54.2 ± 5O6.O	933.9 ± 427.3 (3)	1148.0 ± 546.9 (2)	O.O45
LH level on hCG day (IU/L)	3.O ± 2.1	3.6 ± 3.2	3.3 ± 2.7	O.475
Progesterone level on hCG day (ng/ml)	O.8 ± O.5	O.8 ± 0.6	1.0 ± 0.7	O.166
Number of follicles ≥17 mm on hCG day (mm)	2.1 ± 1.O	1.9 ± 1.O	2.0 ± 1.3	O.294
Endometrial thickness on hCG day (mm)	1O.4 ± 2.3	1O.1 ± 2.4	10.7 ± 2.0	O.179
Cycle cancellation rate, n (%)	12 (8.8)	8 (7.6)	7 (9.1)	O.924
Number of Oocytes retrieved	3.2 ± 1.3	3.1 ± 1.4	3.4 ± 1.9	O.41O
Number of MII Oocytes	2.7 ± 1.2	2.5 ± 1.3	2.9 ± 1.4	O.138
Fertilization rates, n of PN (%)	262 (7O.6)	183 (69.1)	150 (67)	O.645
Number of transferred embryos	1.8 ± O.8	1.7 ± O.7	1.6 ± 0.7	O.1O4
Clinical pregnancy rate, per patient, n (%)	17 (13.7)	14 (14.4)	16 (22.9)	O.214
Live birth rate, per patient, n (%)	12 (9.7)	10 (1O.3)	15 (21.4)	O.O42

A mean and standard deviation (SD) were used to calculate the data. Estradiol (E2), luteinizing hormone (LH), and human chorionic gonadotropin (hCG) are all abbreviations for the same hormone. M2, PN: Pronucleus, MII: Metaphase II. A p-value of 0.05 was deemed significant when differences between groups were shown with a Superscript (n).

For all three groups, a clinical pregnancy was obtained in 47 out of 291 individuals (or 16.2%). There was a statistically insignificant difference between the CPR in group 3 and that in groups 1 and 2, even though group 3 had a greater CPR. 37 out of 291 women who went into labour gave birth live (12.7 percent). Group 3 had significantly greater LBR than groups 1 and 2 (21.4% vs. 9.7% vs. 10.3%, respectively; p=0.05).

Discussion

Recent years have witnessed a rise in the usage of GnRH antagonist and micro-dose flare-up regimens in patients who don't react well to the extended luteal protocol. POR patients were compared to each other using micro-dose flare-up and GnRH antagonist regimens (5, 12-14). Only a single RCT has compared the IVF results of these procedures side by side with a lengthy protocol in people who don't react well to treatment, therefore further research is needed (11). Despite the fact that NOR and the quantity of metaphase II oocytes were

similar across groups in our research, the LBR was significantly greater in the protracted luteal group compared to the micro-dose flare-up and GnRH antagonist regimen.

It was shown that when comparing the micro-dose group to the long agonist regimen, both the pregnancy rate (PR) and the cancellation rate (CR) rose substantially (PR) and dropped significantly (CR) (15, 16). Kdous et al., on the other hand, discovered no significant difference in PR across groups (17). In one RCT, there were no changes in oocyte counts or pregnancy outcomes between the two groups (18). The lengthy flare-up treatment, on the other hand, had substantially greater CPR and NOR than the short procedure, according to a recent Cochrane study (10). Although short flare protocols didn't reflect micro-dose flare protocols, the findings couldn't be utilised to compare short flare protocols with longer ones.

In comparison to the lengthy treatment, the GnRH antagonist regimen had greater NOR, implantation, and PR overall (9, 19). NOR did not vary substantially between the two groups in Sunkara et alrecent .'s RCT, with a non-significantly greater OPR in the antagonist group (11). In a recent meta-analysis, Lambalk et al. found comparable NOR, CPR, OPR, and LBR in two groups (20). For those who don't react well to GnRH antagonists, one RCT showed that a lengthy agonist regimen led to better NOR and CPR than the GnRH antagonist group (21).

There are conflicting results in the literature when comparing the micro-dose flare-up to a GnRH antagonist regimen. Similar NOR and pregnancy rates were observed in both groups by Kahraman et al., but the micro-dose group had greater E2 levels (5). Schmidt et al. found no changes in E2 levels between the two groups on the day of hCG, NOR, or CPR in their study (13). Additionally, Merviel et al. found comparable NOR, OPR, and CPR in a recent randomised controlled trial (22). It was discovered by Boza et al. that peak E2 levels and CPR did not vary across groups despite a substantial increase in the number of metaphase II oocytes in the micro-dose group (23). According to Ghaffari et alrecent .'s RCT, both groups had comparable NOR and CPR. However, the LBR in the micro-dose group was considerably greater (24). CPR and OPR did not vary across groups in another RCT, however NOR and the total number of metaphase II oocytes were greater in the antagonist group. Davar et al. The antagonist treatment regimen they employed, however, included GnRH antagonist as well as an oestrogen priming inhibitor seven days before stimulation (25). The GnRH antagonist group's CPR and OPR increased significantly, although the difference was not statistically significant, according to Fasouliotis et al (12). OPR was also shown to be substantially greater in groups receiving antagonists compared to controls, even though E2 levels were higher in the micro-dose group one day after hCG injection (14). According to our findings, there were no significant differences in terms of NOR, CPR, or LBR between the two groups (5, 13, 22).

A substantial increase in LBR was seen in our study's long agonist group compared to the other groups. Sunkara et al. recently evaluated all of these procedures and discovered that the GnRH antagonist group had nonsignificantly greater OPR than the other groups (11). The authors speculate that the limited sample size contributed to the lack of significance. The retrospective research design may have contributed to our findings. The relatively favourable prognosis of patients in the long GnRH group may possibly account for the increased pregnancy rates in this group, despite the fact that the mean age was comparable in both. Patients with the lowest FSH and the greatest AFC on the third day of the cycle were included in the extended protocol group, which may have contributed to the positive outcomes. For individuals who don't react well to other treatments, the long agonists may represent POSEIDON Groups 1 or 2. Prognostic variables such as ovarian reserve metrics, in addition to the stimulation regimen, seem important on IVF outcomes in excellent prognosis poor responders as POSEIDON Group 1 and 2. The homogeneity of the study population could not be given in its entirety, although three different stimulation regimens were tested at the same time in our investigation. These +*-findings contribute to the growing body of data that long-term administration of an agonist may improve response rates in patients who have previously failed to react.

Conclusion

IVF success rates are heavily influenced by a woman's ovarian reserve. A lengthy ovarian

stimulation regimen may have a beneficial impact on IVF conception results in women who are poor responders but have excellent ovarian reserve indicators before stimulation.

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Original Article

Improvement in Hemoglobin levels after Intravenous Iron Therapy in Anemic Children

Anum Qayyum[1],Irshad Hussain[2],Sami Ullah[3],Zohaib Raza[4],Ayisha Tariq[5],Sara shohab[6],Hassan Mumtaz[7]

[1] *Child Specialist, Uhealth International Hospital, Islamabad*
[2] *DMO Paediatrics, KRL Hospital Islamabad*
[3] *Medical Officer: IHITC Islamabad*
[4,5,6] *Resident Paediatrics: Holy Family Hospital Rawalpindi*
[7] *Medical Officer: Clinical Research Center Shifa International Hospital Islamabad*

Author's Contribution

[1] *Conception of study*
[2] *Experimentation/Study conduction*
[3,4] *Analysis/Interpretation/Discussion*
[5] *Manuscript Writing*
[7] *Critical Review*
[6] *Facilitation and Material analysis*

Corresponding Author

1. *Dr. Hassan Mumtaz*
Medical Officer: Clinical Research Center,Shifa International Hospital Islamabad

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Abstract

To see how much an intravenous iron treatment raises haemoglobin levels in children with iron deficiency anaemia who aren't improving with oral iron supplements.

A Quasi-experiment carried out at the POF Hospital in Wah Cantt's Department of Pediatrics. A total of 50 youngsters were tracked from October 2017 to March 2018. Venofer, an iron sucrose formulation, is administered in the prescribed dosage using a mathematical calculation. It was administered to patients as an indoor case over the course of an hour with a 1:1 dilution of normal saline, and Hb was repeated after a time of four weeks once again.

According to our findings, the average age of the 50 children was 6.9 years, with a standard deviation of 2.98 years. 62 percent of the participants were men, while 38 percent were women. Hemoglobin levels were 6.12 g/dl at baseline, with a standard deviation of 1.15, and 8.20 g/dl after treatment completion, with a standard deviation of 2.02. Hemoglobin levels rose on average by 2.08 g/dl, with a standard deviation of 0.87.

We found a mean increase in haemoglobin of 2.08 g/dl with an SD of 0.87 in children with iron deficiency anaemia not responding to oral iron supplementation with intravenous iron treatment.

Keywords: mean rise in hemoglobin level, intravenous iron therapy, children, iron deficiency anemia, oral iron supplementations.

INTRODUCTION

Iron deficiency anaemia is characterised by a steady fall in serum ferritin levels, resulting in lower haemoglobin concentrations than in people of the same age and sex who are not iron deficient. People with poor socioeconomic level are more likely to have anaemia, especially developing children and pregnant women, who have an increased need for iron [2]. It is well recognised that iron deficiency anaemia in children is a serious public health issue, and it is the most common type of micronutrient insufficiency in both developing and developed nations, affecting both men and women [3]. Anemia affects about 43% of children under the age of 5 worldwide, with iron deficiency anaemia accounting for half of these cases [4]. Around 10% of healthy Pakistani youngsters are affected [5].

Of all the reasons, inadequate intake of dietary iron is one of the common causes of iron deficiency anemia. Increase iron demand during growth span, malabsorption, inadequate consumption and loss of blood are some other reasons [6]. Other causes include ingestion of certain plant components in vegetables and tea (e.g., phytates), calcium and cow's milk proteins which inhibit iron absorption [7]. Iron deficiency anemia in children is associated with slower reaction time, poor cognition, behavioral issue, low grade school performance and poor motor skills [8]. Treatment of iron deficiency anemia includes iron enriched diet along with oral iron supplement.

Some patients encountered problems with oral iron therapy like poor compliance, intolerance, unpleasant taste and gastrointestinal disturbances so parenteral iron administration may be offered in this case [9]. There are a number of different intravenous iron formulations. When it comes to iron dextran and iron gluconate, there are a variety of side effects to consider, but iron sucrose therapy is safe and effective no matter what the underlying reason may be. The mean increase in haemoglobin after 4 weeks of treatment was 2.21+0.87 g/dl in children who did not react well to oral iron therapy [5].

We face inadequate control of oral ironsupplementation in children with iron deficiency anaemia in Pakistan, where it is extremely prevalent. The use of parenteral iron as an alternative therapy to oral iron as well as studies on its efficacy in children is very limited in Pakistan [5].

We wanted to conduct this study to estimate the mean rise of hemoglobin with parental iron administration and to implement this treatment as a new alternative in the patient not responding to oral iron therapy.

For children with iron deficiency anaemia who didn't react to oral iron supplementation, our primary goal was to assess the mean increase in haemoglobin levels.

MATERIALS AND METHODS

POF Hospital in Wah Cantt, Malaysia, carried out this quasi-experimental research. From 12 October 2017 until 12 March 2018, the research study lasted six months.

We used the WHO's sample size calculator to figure out the sample size, and the results are as follows: 95 percent confidence interval, mean haemoglobin increase of 2.21 + 0.875 milligrammes The research had an absolute precision of 0.25 and comprised 50 participants.

In this case, Non Probability Convenience Sampling was utilised as the sampling technique.

Inclusion Criteria:

Children with age ranging from 1 to 12 years visiting outpatient department, both genders & children having Iron deficiency anemia (Hb < 8 g/dl) not responding to 3 months of oral iron therapy from pediatrics OPD

Exclusion Criteria:

Children having Anemia due to gastrointestinal or pulmonary blood loss, Severely anemic child requiring transfusion with red cell concentrate (Hb < 4g/dl), Anemia due to malabsorption syndromes like celiac disease, tropical sprue, inflammatory bowel disease & Anemia of chronic disease (chronic kidney disease, chronic liver disease), Patient with hemoglobinopathy & Known hypersensitivity to iron sucrose.

DATA COLLECTION PROCEDURE:

The Institutional Ethical Committee gave its blessing, and the parents gave their

informed permission. A detailed history and physical examination was carried out. Duration and compliance of oral iron therapy was also be inquired. Hemoglobin and ferritin levels were taken. Patients fulfilling the inclusion criteria and agreed for intravenous iron therapy was given iron sucrose preparation (venofer) according to dose calculated as formula mentioned below.

Required iron dose (mg) = (Target Hb - Actual Hb)g/dl × weight(kg) × 0.24 + 15 × weight (kg)[6]

Maximum daily dose was 6mg/kg and given in divided doses every 3-7 days until total dose was given to the patient. Patient was tested with test dose before giving first dose. The therapy was given to patients as indoor case over a period of 1 hour with 1:1 dilution with normal saline. After four weeks of giving intravenous iron therapy, response was assessed by taking Hb (g/dl) again. Child was excluded from study if he develops any disease causing blood loss (hemorrhage, melena, epistaxis, or haematemesis) or receives blood transfusion. These were managed accordingly by the department of medicine depending upon the severity of the condition. All data was noted down on a Performa.

DATA ANALYSIS PROCEDURE:

SPSS version 16 was used for data entry and analysis. Quantitative and qualitative factors were assessed using descriptive statistics. Quantitative variables (age, hemoglobin level before therapy, hemoglobin level after therapy) was measured as mean + S.D. For qualitative variable (gender) frequency and percentage was calculated. Test of significance was paired sample T test. Stratification was used to manage effect modifiers including patient age, weight, and therapy duration. A paired sample T test was used once stratification had taken place. The results were deemed statistically significant when the P value was less than 0.05.

RESULTS

Age distribution among 50 children as analyzed as 29(58%) children were in age range 1-6 years and 21(42%) children were in age range 7-12 years. Mean age was 6 years with SD ± 2.98. Gender distribution among 50 children was analyzed as 31(62%) children were male and 19(38%) children were female, as described in table 1.

Weight distribution among 50 children as analyzed as 28(56%) children had weight <15 Kgs and 22(44%) children had weight >15 years. Mean weight was 15 Kgs with SD ± 12.371. Duration of treatment among 50 children as analyzed as 26(52%) children had duration of treatment < 4 weeks while 24(48%) children had duration of treatment >4 weeks. Mean duration of treatment was 4 weeks with SD ± 4.472, has been described in table no 2. The mean doses required were 24.76 mg Iron sucrose.

Status of hemoglobin level 50 patients was analyzed as mean hemoglobin level at baseline was 6.12 g/dl with SD ± 1.15 while mean hemoglobin level after treatment was 8.20 g/dl with SD ± 2.02. Mean rise in hemoglobin level was 2.08 g/dl with SD ± 0.87, has been described in table no 3.

Stratification of rise in hemoglobin level with respect to age, gender is given in table no 4. Weight and duration of treatment Stratification is given in table no 5.

TABLE NO 1. Age, Gender, Frequency of WEIGHT DISTRIBUTION & Treatment Duration. Distribution

		FREQUENCY	PERCENTAGE
Age	**1 - 6 years**	29	58%
	7-12 years	21	42%
Gender	**Male**	31	62%
	Female	19	38%
WEIGHT	**≤ 15 kg**	28	56%

	>15kg	22	44%
TREATMENT DURATION	**≤ 4 weeks**	26	52%
	>4 weeks	24	48%

TABLE NO 2. MEAN HAEMOGLOBIN LEVEL

HB Level	**Before treatment (baseline)**	**After treatment**	**mean rise in Hb level**	**T Test**
	Mean and SD	**Mean and SD**	**Mean and SD**	
Mean and SD	6.12 g/dl ± 1.15	8.20 g/dl± 2.02	2.08 g/dl + 0.87	0.0001

TABLE NO 3. STRATIFICATION OF MEAN RISE IN HB LEVEL W.R.T AGE & Gender DISTRIBUTION

Age Group		**Hb Level**		**T Test**
		Pre Hb	**Post Hb**	
		Mean and SD	**Mean and SD**	
1- 6 years	n=29	6.87 g/dl ± 2.09	8.77 g/dl± 3.27	0.0108
7 -12 years	n=21	6.71 g/dl ± 1.93	8.56 g/dl± 3.22	0.0295
Gender				
Male	n=31	6.58 g/dl ± 1.97	8.46 g/dl± 3.18	0.0069
Female	n=19	6.63 g/dl ± 1.82	8.61 g/dl± 3.34	0.0294

TABLE NO 4. STRATIFICATION OF MEAN RISE IN HB LEVEL W.R.T WEIGHT DISTRIBUTION & Treatment Duration

Weight		**Hb Level**		**T Test**
		Pre Hb	**Post Hb**	
		Mean and SD	**Mean and SD**	
≤ 15 kg	n=28	6.71 g/dl ± 1.78	8.35 g/dl± 3.25	0.0229
>15 Kg	n=22	6.58 g/dl ± 1.67	8.63 g/dl± 3.37	0.0143
DURATION OF TREATMENT				
Before 4 weeks	n=50	6.11 g/dl ± 1.14	6.23 g/dl± 1.22	0.6125
After 4 weeks	n=50	6.13g/dl ± 1.17	8.25 g/dl± 2.05	0.0001

DISCUSSION

Iron deficiency anaemia is characterised by a steady fall in serum ferritin levels, resulting in lower haemoglobin concentrations than in people of the same age and sex who are not iron deficient. People with poor socioeconomic level are more likely to have anaemia, especially developing children and pregnant women, who have an increased need for iron [2]. It is well recognised that iron deficiency anaemia in children is a serious public health issue, and it is the most common type of micronutrient insufficiency in both developing and developed nations, affecting both men and women [3].

According to our findings, the average age of the 50 children was 6.9 years, with a standard

deviation of 2.98 years. Children made up 62% of the population, with women accounting for 38% of the population. Average weight was 15 kg, while the standard deviation was 12.371 kg (kg). The average treatment time was 5 days, with a standard deviation of 4.472 days. Hemoglobin levels were 6.12 g/dl at baseline, with a standard deviation of 1.15, and 8.20 g/dl after treatment completion, with a standard deviation of 2.02. Hemoglobin levels rose on average by 2.08 g/dl, with a standard deviation of 0.87.

A research by Arshed A et al [10] found that children who did not react well to oral iron therapy responded well to parenteral iron therapy, with a mean increase in haemoglobin of 2.21+0.87 g/dl after 4 weeks of treatment.

Another study by Roganovi J et al [11] found similar results after administering 76 intravenous iron infusions to twelve youngsters. Hemoglobin levels ranged from 6.5 to 10.6 g/dl before therapy (SD=1.7). Hemoglobin levels ranged from 11.0 to 13.2 g/dl after two months (SD=1.0). Within two months of receiving intravenous iron, haemoglobin concentration increased by 2.7 g/dl (from 0.4 to 5.4 g/dl) significantly (p=0.005). Parenteral iron treatment resulted in a median haemoglobin increase of 2.7 g/dl in only two months for these patients. Only a little side effect was noted.

In another study, done by Danko I et al [12], the mean age was 5 years, with an SD of 3.121 years. Children made up 60% of the population, with 40% being female. Hemoglobin levels were 6.18 g/dl at baseline, with a standard deviation of 1.21, and 9.20 g/dl after treatment completion, with a standard deviation of 2.01. Children with iron deficiency anaemia treated with intravenous iron treatment had a mean increase in haemoglobin of 3.02 g/dl and an SD of 1.07 g/dl.

Similar results were found in a research by Vijay N Yewale et al [13] that included 73 of the 81 children that were examined. There was a substantially greater increase in Hb in the ferrous ascorbate group after 12 weeks than in the colloidal iron group (P 0.01) When compared to colloidal iron, a significantly greater percentage of children who received ferrous ascorbate (64.86 percent vs. 31.03 percent; P 0.01) became non-anemic.

According to a research conducted in the United States, 1500mg of iron supplementation is optimal for anaemic individuals who are iron deficient, and a modified Ganzoni formula should be used to calculate the appropriate dosage [14]. Researchers in Boston found that iron sucrose was both safe and effective in increasing haemoglobin levels in healthy adults [15].

According to a study, iron sucrose is safe and effective in children's therapeutic settings, and ferumoxytol is presently being studied [16].

Limitations:

The main limitations of this study is small sample size and lack of randomization of the participants of the study. We recommend researchers to conduct a randomized control trial investigating the effect of IV iron sucrose on a larger population.

CONCLUSION

Our study concludes that mean rise in hemoglobin level was 2.08 g/dl with SD ± 0.87 with intravenous iron therapy in children with iron deficiency anemia who did not respond oral iron supplementations.

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Original Article

MATERNAL AND FETAL OUTCOME AMONG PREGNANT WOMEN PRESENTING WITH MILD, MODERATE AND SEVERE THROMBOCYTOPENIA

Aima Athar[1], Humera Noreen[2], Shagufta Saeed Sial[3]

[1]Post Graduate Trainee FCPS, Department of Obstetrics and Gynaecology, Benazir Bhutto Hospital, Rwp.
[2]Assistant Professor, Department of Obstetrics and Gynaecology, BBH, Rwp.
[3]Dean Obstetrics and Gynaecology, RMU and Allied hospitals, Rwp.

Author's Contribution

[1,2] Conception of study
[1] Experimentation/Study conduction
[1,2]Analysis/Interpretation/Discussion
[1] Manuscript Writing
[2,3] Critical Review
Facilitation and Material analysis

Corresponding Author

Dr Aima Athar
Post Graduate Trainee FCPS, Department of Obstetrics and Gynaecology, Benazir Bhutto Hospital, Rwp
dr.aimaathar@gmail.com

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Abstract

Background: Anemia is the most frequent haematological problem in pregnancy, followed by thrombocytopenia. Thrombocytopenia complicates about 8% of pregnancies, with the majority of these cases occurring in the third trimester.
Objective: To find out whether pregnant women with mild, moderate, or severe thrombocytopenia had a better pregnancy outcome.
MATERIAL AND METHODS: A descriptive research was carried out at Benazir Bhutto Hospital in Rawalpindi's Department of Obstetrics and Gynecology. All pregnant women in the study had a full blood count done. The research comprised 116 women with a platelet count below 150 103/L. A manual platelet count was used to validate the results. The ladies were split into three groups based on their platelet counts. Blood tests are performed on each member of the first group to determine their platelet count (MILD). People in Group 2 have a platelet count of 50-100 x103/ul (MODERATE). Platelet count of 50 x103/L in the third group (SEVERE). There was a fetal-maternal result. Postpartum haemorrhage, method of delivery, requirement for platelet transfusion, and maternal death were all considered maternal outcomes. Baby's weight, Apgar score, and admission to the Neonatal Intensive Care Unit were documented as foetal outcomes.
RESULTS: Most of the women in my research were between the ages of 26 and 35. (57 percent). The population's median age was 29 years. The platelet count ranged from 32000 to 149000/L, with a mean of 109 x 103/L. Mild thrombocytopenia was seen in the majority of female patients in this study (64). In the current research, gestational thrombocytopenia accounted for 72 percent of instances of thrombocytopenia in pregnancy, with hypertension complicating pregnancy accounting for 15 percent of cases. One percent of patients had HELLP. Ten percent (12) of the women required platelet transfusion. Ninety-four percent of the women delivered by caesarean section, while the remaining six percent did it vaginally. Only maternal and obstetric reasons dictated the delivery method. Only one percent of the babies in our research had to be admitted to the neonatal intensive care unit, and 25 percent of the babies were too tiny for their gestational age.
CONCLUSION: However, in life-threatening situations like as HELLP syndrome, treating an expectant mother with severe thrombocytopenia may be difficult. When a woman's pregnancy is at high risk, close monitoring is necessary to catch problems early and provide her the care she needs quickly. This will help the baby and the mother live healthier lives. Due to its lack of connection to an unfavourable pregnancy outcome, gestational thrombocytopenia may be considered a benign disease.
KEYWORDS*: **Thrombocytopenia, Pregnancy induced hypertension, Pre-eclampsia, Eclampsia, HELLP syndrome.***

Introduction

Platelets, also known as thrombocytes, are derived from megakaryocytes in the bone marrow. Hemostatic platelets seal endothelial damage and serve as a surface for secondary hemostasis through the coagulation pathway. Platelets are engaged in primary hemostasis. Platelet concentrations in the blood range from 1,500,000 to 4,00,000/L in healthy individuals. Tissue macrophages remove them from circulation after 8-10 days of residence in the periphery.

The most essential element in determining whether or not a pregnant woman with thrombocytopenia should be treated is a clinical examination. Current or prior bleeding issues, family history of bruising, history of alcohol or drug addiction, previous obstetrical history, and transfusion history are all examples of medical history. Petechiae, ecchymosis, nose and gum bleeding, hematuria, gastrointestinal bleeding, and cerebral bleeding are all signs of thrombocytopenia.1.[1]

THROMBOCYTOPENIA IN PREGNANCY

Pregnancy-associated anaemia is the second most frequent haematological abnormality. If your platelet count is less than 1,50,000/L, you have thrombocytopenia. Pregnancy-related thrombocytopenia is readily detectable because to standard prenatal screening. When the platelet count is fewer than 50/L, clinical symptoms are rare unless there is a problem with platelet function.2

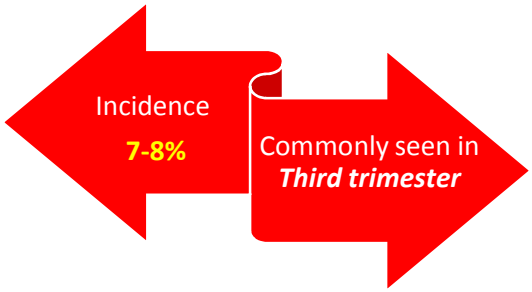
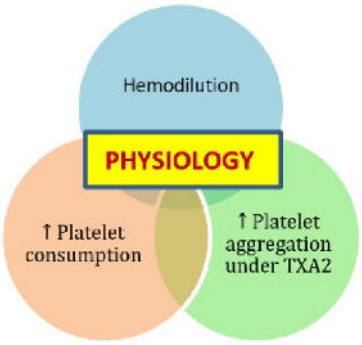


Figure1: Thrombocytopenia in pregnancy

THROMBOCYTOPENIA IN PREGNANCY – A Dilemma for Obstetrician:

For an obstetrician, dealing with thrombocytopenia presents a significant difficulty. Medical disorders that cause severe thrombocytopenia may have devastating effects on the mother and foetus, necessitating close monitoring and treatment. Antepartum and postpartum haemorrhage linked to thrombocytopenia are significant issues. As a result, an obstetrician must know how to treat patients with varying degrees of thrombocytopenia. When a caesarean section is necessary, there is an increased risk of anaesthetic problems, which may influence the delivery method. Thrombocytopenia is a frequent complication of pregnancy, and this research aims to provide insight on various facets of the condition, including the effect it has on medical professionals' choices and the difficulties faced by obstetricians and haematologists.

- According to the most recent recommendations, it is recommended that:
- Vaginal delivery is safe when platelet count is higher than 30,000/µL.
- Operative vaginal or cesarean deliveries the safe platelet count should be at least 50,000 platelets/µL.



FigFigure 2: Physiology of Thrombocytopenia

- The exact platelet number needed to achieve a safe epidural anesthesia is debated, but in most guidelines, the reference value is around 75,000-80,000/µL.
- Spontaneous bleeding may occur with < 20,000 platelets/µL.
- The risk of internal bleeding is increased if the platelet count falls below 10,000/µL.[3]

DEGREE OF THROMBCYTOPENIA:

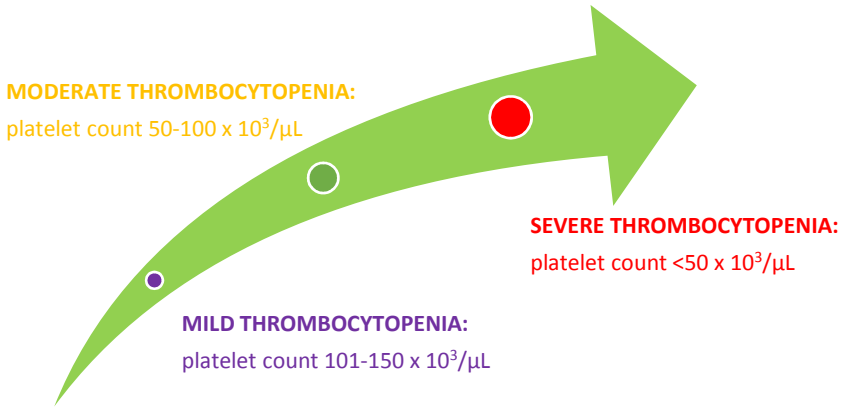


Figure 2: Degrees of Thrombocytopenia

Causes and Relative Incidence of Thrombocytopenia in Pregnancy

Table 1:Causes and relative incidence of thrombocytopenia in pregnancy

	Pregnancy-specific	Not pregnancy-specific
Thrombocytopenia	Gestational thrombocytopenia (70-80%)	Primary ITP (1-4%) Secondary ITP (<1%)* Drug-induced thrombocytopenia ** Type IIB von Willebrand disease ** Congenital thrombocytopenia **
Thrombocytopenia associated with systemic disorders	Severe preeclampsia (15-20%) HELLP syndrome (<1%) AFLP (<1%)	TTP/HUS ** Systemic lupus erythematosus ** Antiphospholipid syndrome ** Viral infections ** Bone marrow disorders ** Nutritional deficiency ** Splenic sequestration (liver diseases, portal vein thrombosis, storage disease, etc) ** Thyroid disorders **

*Secondary ITP includes isolated thrombocytopenia secondary to some infections (HIV, HCV, H. pylori) and to other autoimmune disorders such as systemic lupus erythematous. ** Rare (probably <1%)[4]

GESTATIONAL THROMBOCYTOPENIA: Automated blood counts in regular prenatal screening have increased the number of diagnoses of gestational thrombocytopenia, and the following five factors make it more likely:

- Asymptomatic
- No previous history of bleeding
- Preconception/early gestation normal platelet count
- Mild to moderate thrombocytopenia: >70 × 10^3/µL
- Returns to normal within 2-12 weeks postpartum

More than 75% of pregnant women with thrombocytopenia had this condition, which has an incidence of 8%. Pregnancy is not endangered by gestational thrombocytopenia. There's no obvious cause for this. [2,9,10]

IMMUNE THROMBOCYTOPENIC PURPURA ITP

- Idiopathic thrombocytopenic purpura or Autoimmune

Intake

Materials and Methods

All antenatal women underwent complete blood picture as per routine. The women with platelet count < 150 × 10 9 /L were included in the study. Further confirmation was done by manual platelet count. On the basis of platelet count the women were divided into three groups.

Group 1: platelet count 101-150 x 10^3/µL (MILD)
Group 2: platelet count 50-100 x 10^3/µL (MODERATE)
Group 3: platelet count less than 50 x 10^3/µL (SEVERE)

Specific investigations like coagulation profile (PT, APTT, FDP and fibrinogen) RFT and LFT were done only if clinically indicated. Other investigation was done as and when required. Complete and detailed work up of all cases

thrombocytopenic purpura (ATP).

- Incidence is 1/1,000-10,000 pregnancies
- Accounts for 3% of all pregnancies.
- It causes significant fetal thrombocytopenia (<50,000/μL), as antiplatelet antibodies may cross the placenta which could result in bleeding complications in the neonate.

PRE-ECLAMPSIA AND ECLAMPSIA :

- Preeclampsia accounts for 21% of cases of maternal thrombocytopenia. Thrombocytopenia is usually moderate to severe. Platelet count rarely decreases to <20,000/μL.
- Severe spectrum - the vascular endothelial damage produces microangiopathic hemolytic anemia, elevating liver enzymes along with thrombocytopenia and establishing a syndrome known as HELLP syndrome (hemolysis, elevated liver enzymes, low platelets).
- Hypertensive disorders occur in 7-10% of all pregnancies.
- HELLP complicates 4-12% of all women with preeclampsia.
- Neonates may be at increased risk for thrombocytopenia.[11]

OBJECTIVE: To describe the feto-maternal outcome among pregnant women presenting with mild, moderate and severe thrombocytopenia**.**

INCLUSION CRITERIA: All pregnant women with platelet count less than 150×10^3/μL, diagnosed with thrombocytopenia after the gestational age of 28 weeks.

EXCLUSION CRITERIA: Women with known history of drug

of Obstetrics and Gynaecology, BBH, Rawalpindi

STUDY PERIOD: 1st January, 2019 to 31st November, 2019.

SETTING: Department of Obstetrics and Gynecology, Benazir Bhutto Hospital, Rawalpindi, a tertiary care hospital affiliated with Rawalpindi Medical University.

was done to determine the cause of thrombocytopenia. History of petechiae, bruising, drug usage, viral infection, thrombocytopenia in previous pregnancy was taken. The data was recorded on printed proforma which included clinical details regarding demographic data, presenting complaints, obstetric and menstrual history, symptoms of thyroid dysfunction, associated medical illness like hypertension, or other cardiovascular diseases, diabetes mellitus, drug history and general physical examination, systemic examination, obstetrical examination including pelvic examination was done. Gestational age was established by menstrual history and clinical examination and confirmed by USG. All the cases were followed until delivery to record any complications like preterm labor, abruption, preeclampsia, any other morbidity. Duration of pregnancy at the time of delivery, indication of induction and mode of delivery including indication for instrumental delivery or caesarean section were recorded. Cord blood sampling of neonates was done for thrombocytopenia.

MATERNAL OUTCOMES RECORDED WERE:

- Need for platelet transfusion
- Maternal mortality
- Postpartum hemorrhage
- Mode of delivery

FETAL OUTCOMES RECORDED WERE:

- Weight of fetus
- APGAR score
- Still birth / IUD
- NICU admission

STUDY DESIGN: Descriptive study

STUDY POPULATION: All pregnant women presenting with platelet count less than 150×10^3/μL in the Department

STATISTICAL ANALYSIS: Data were analyzed by using SPSS version 22.0

Results

A total of 116 women were included in this study. Most of them were between 26-35 years age group (57%). The mean age in our study was 29.3 years, with majority being multiparas. Major bulk presented as asymptomatic with only 8 having antepartum hemorrhage.

Table 2: Group wise Age distribution

AGE GROUP	MILD n=75	MODERATE n = 39	SEVERE n= 2
15-25 years	30 40%	14 35.8%	1 50%
26-35 years	42 56%	24 61.6%	0 0%
36-45 years	3 4%	1 2.6 %	1 50%

Table 3: Age Distribution

AGE GROUPS	No. of cases n= 116
15-25 years	**45 (39%)**
26-35 years	**66 (57%)**
36-45 years	**5 (4%)**

Table 4: Groupwise Parity distributuon

PARTY	MILD n=75	MODERATE n = 39	SEVERE n= 2
PG	31 41.3%	13 33.3%	0 0%
P_2-P_5	35 46.7%	23 59%	1 50%
>P_5	9 12%	3 7.7%	1 50%

Table 5: Groupwise Presenting Complaints

PRESENTING COMPLAINTS	MILD n=75	MODERATE n = 39	SEVERE n= 2
Asymptomatic	**72 96%**	**35 89.7%**	**1 50%**
Antepartum hemorrhage	**3 4%**	**4 10.3%**	**1 50%**
Bleeding manifestations	**0 0%**	**0 0%**	**0 0 %**

Majority of the women had mild thrombocytopenia (64.7%). 33.5 % had moderate and only 1.8% had severe thrombocytopenia.

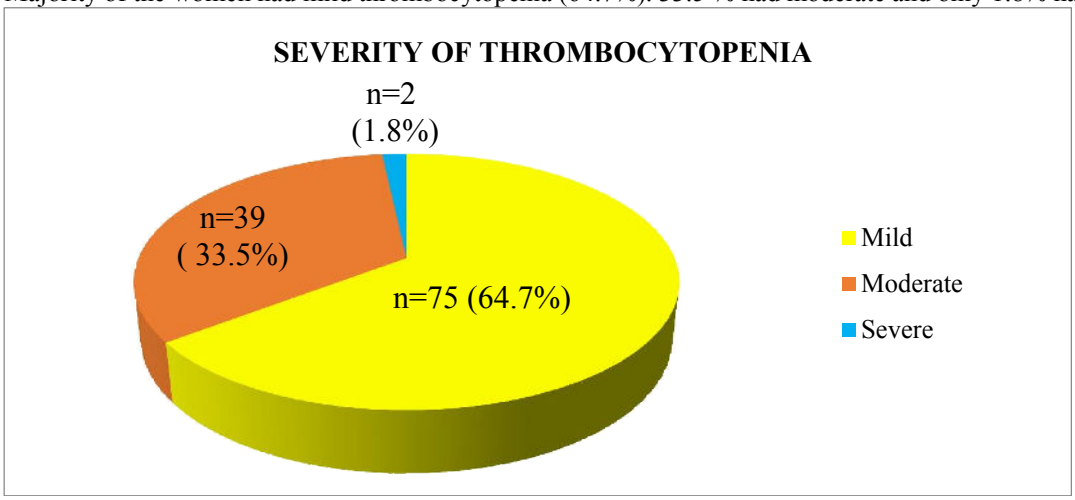


Figure 3: Severity of Thrombocytopenia

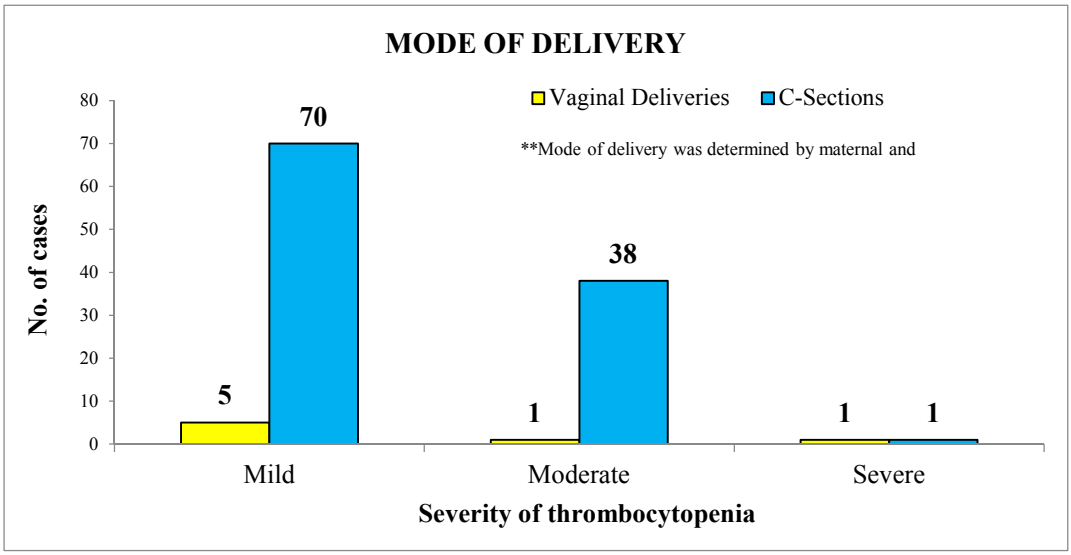


Figure 4 Severity vs Mode of Delivery

13.3% of the women with moderate thrombocytopenia and 100% of women with severe thrombocytopenia required platelet transfusion**.** Out of 116 women, 94% had casarean section and 6% underwent normal vaginal delivery. Mode of delivery was determined by maternal and obstetric indications alone.

Table 6: Groupwise distribution in terms of Platelet transfusion, maternal mortality and mode of delivery

GROUPS	NEED FOR PLATELET TRANSFUSION n= 12	MATERNAL MORTALITY n= 0	Vaginal Deliveries n=7	Caesarean Sections n= 109
MILD	**0 0%**	**0 0%**	**5 6.7%**	**70 93.3%**
MODERATE	**10 13.3%**	**0 0%**	**1 2.6%**	**38 97.4%**
SEVERE	**2 100%**	**0 0%**	**1 50%**	**1 50%**

Along the risk factors associated, 40% of the women were previosuly scarred, 14% were having PIH, 5.2% with placenta accrete and IUGR each, 1.8% placenta previa and HELLP syndrome. 7% withpreeclampsia and 4.3% with placental abruption, eclampsia and GDM each.

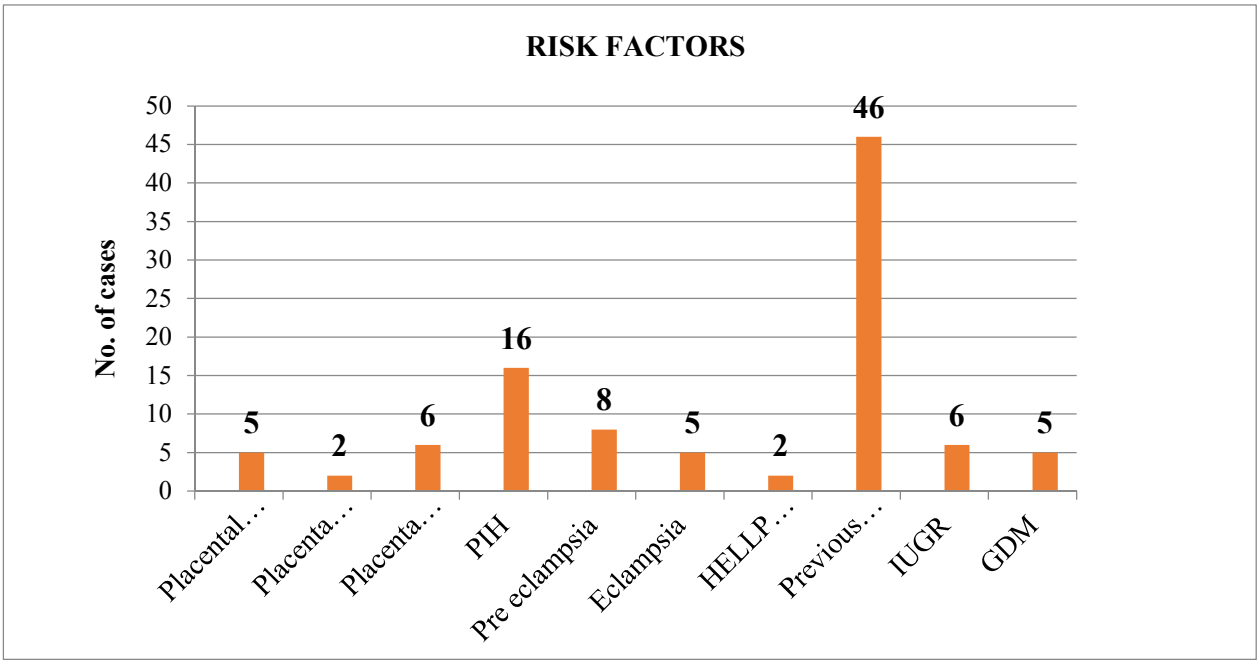


Figure 5: Risk factors Associated with thrombocytopenia

Table 7:Group wise distribution of Causes of thrombocytopenia

Pregnancy Specific/Nonspecific causes	MILD n=75		MODERATE n = 39		SEVERE n= 2	
Gestational thrombocytopenia	**62**	**82.7%**	**21**	**53.9%**	**0**	**0%**
PIH	**7**	**9.3%**	**9**	**23.1%**	**0**	**0%**
Pre-eclampsia	**5**	**6.7%**	**2**	**5.1%**	**1**	**50%**
Eclampsia	**1**	**1.3%**	**4**	**10.2%**	**0**	**0%**
HELLP syndrome	**0**	**0%**	**1**	**2.6%**	**1**	**50%**
ITP	**0**	**0%**	**2**	**5.1%**	**0**	**0%**

Regarding causes of thrombocytopenia, 72 % were diagnosed as gestational thrombocytopenia, 15% as PIH, 7% as having preeclampsia, 4% as eclampsia. HELLP syndrome was seen in 1% of the cases. ITP was seen in 2 cases only.

Table 8: Overview of Causes of thrombocytopenia

CAUSES	n= 116		CAUSES	n= 116	
Gestational thrombocytopenia	**83**	**72%**	**Eclampsia**	**5**	**4%**
Pregnancy induced hypertension	**16**	**15%**	**HELLP syndrome**	**2**	**1%**
Pre eclampsia	**8**	**7%**	**Idiopathic thrombocytopenic purpura**	**2**	**1%**

Table 9: Groupwise distributuion of gestational age

GESTATIONAL AGE	MILD n=75	MODERATE n = 39	SEVERE n=2

< 34 weeks	5	6.7%	6	15.4 %	0	
34-36+6 weeks	16	21.3%	5	12.8%	0	
37- 40 weeks	44	58.7%	22	56.4%	2	
>40 weeks	10	13.3%	6	15.4%	0	

Among maternal complications, postpartum hemorrhage was seen in 6% of the cases with 6 women in moderate group and 1 in mild group. No case of episiotomy or caesarean scar site hematoma reported.

Table 10: Maternal Complications

MATERNAL COMPLICATIONS	MILD n=75		MODERATE n = 39		SEVERE n=2	
Post-partum hemorrhage	1	1.3%	6	15.4%	0	0%
Episiotomy hematoma	0		0		0	
CS site wound hematoma	0		0		0	

114 of the 120 newborns were healthy and alive when they were delivered, compared to 5 who were given an IUD and one who was stillborn. Neonatals delivered to mothers in our research had an average weight of 2.84 kg. Only 25.8% of newborns were too tiny for their gestational age, putting them in the minority (74.2 percent) when it comes to weight. All of the newborns were within the normal range of size for their gestational age. Poor Apgar scores led to the admission of 5% of the newborns to the NICU.

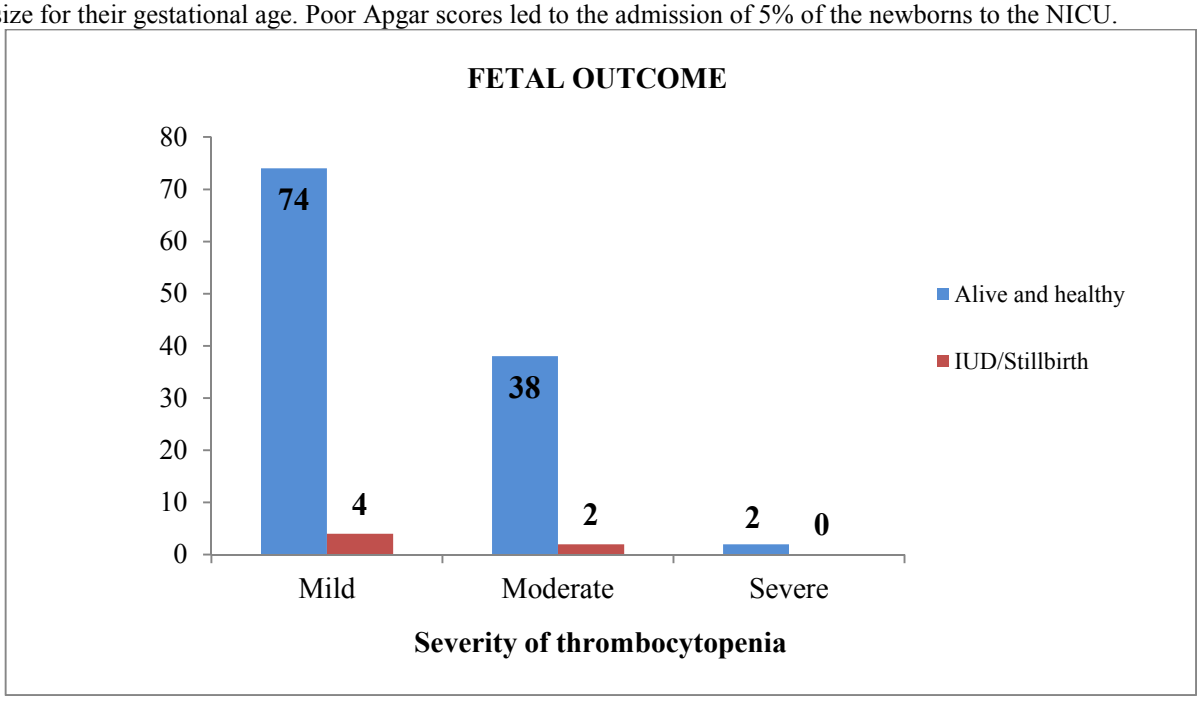


Figure:7: Fetal outcome vs severity of thrombocytopenia

Table 11: Weight of fetus

WEIGHT OF FETUS	MILD n= 78		MODERATE n = 40		SEVERE n= 2	
> 3.5 kg	16	20.5%	6	15%	0	0%
2.5-3.5 kg	41	52.6%	25	62.5%	1	50%
< 2.5kg	21	26.9%	9	22.5%	1	50%

Table 12: Groupwise distributuion of Fetal outcome

FETAL OUTCOME	MILD n= 78		MODERATE n =40		SEVERE n= 2	
Alive and healthy	74	94.9%	38	95%	2	100%
Received IUD	3	3.8%	2	5%	0	0%
Still birth	1	1.3%	0	0%	0	0%
Poor APGAR	2		3		1	
Twins	1		1		0	
Triplets	1		0		0	
NICU admission	2		3		1	

Discussion

However, in life-threatening situations like as HELLP syndrome, treating an expectant mother with severe thrombocytopenia may be difficult.

The majority of the women in my research (66 out of 57 percent) were in their twenties and thirties. Only five of the ladies were in their mid-thirties or early forties (3.4 percent). Our study's average age was 29.3 years, which is in line with the findings of Borna et al. 109 x 103L was the typical platelet count found in the study participants. varying from 32000 to 149000/ L in concentration The majority of women (64.7 percent) experienced mild thrombocytopenia, comparable to the Chauhan V et al. research (63.2 percent). In contrast to our findings and Singh et al., moderate thrombocytopenia was seen in 54% and 74.7 percent of individuals in Borna et al. 5 There was a statistically significant difference between the studies conducted by Singh et al. and ours when it came to the incidence of thrombocytopenia, which was 74.4 percent greater in theirs. 33.5 percent of women had moderate thrombocytopenia, which is in line with Borna et al's findings (30 percent), while only 17.9 percent of patients in Singh et al's research had moderate thrombocytopenia. Compared to Chauhan V et al., only two individuals (1.7 percent) developed severe thrombocytopenia (1.5 percent). 2

In our study 44 patients were primigravida (38%), 59 patients were multigravida (50.9%) and 13 were grandmulti (11.1%). Similar distribution of patient was seen in study by Brohi et al (40.8% women were primigravida).[6]

It was found that anemia was associated in 41 (35.3%) women. leading cause is hypertension complicating pregnancy (25 %).

ITP accounts for 1.7% of women, where as it is higher in study by *Chauhan V et al (3%).*In our study it was found that PIH was associated with 13.8% of patients, while in the studies of Brohi et al its higher (26.70%).[6] HELLP syndrome was seen in 1.7% of women, which is similar to study by *Chauhan V et al (1.5%).* In present study, need for platelet transfusion was seen in 10.3% (12) of the patients which is similar to study by Usha Suresh (8.75%).In my study there were 95 % live births, 4.2% received IUD and 0.8% were still birth. None of the neonates had any bleeding complications. 5 required NICU admission. In our study 25.8% of neonates were small for gestational age where as its incidence is lower in study by *Chauhan V et al (8%).*[2]

Conclusion

As the most frequent cause of thrombocytopenia during pregnancy, gestational thrombocytopenia may be treated as a non-malignant disease. For a patient with thrombocytopenia, the most essential aspect is clinical examination and assessment. Any prior or present bleeding problems, as well as family history and past obstetrics records should all be considered, as should medication usage and blood transfusion history. To reduce fetal-maternal morbidity and mortality, close monitoring is needed in high-risk pregnancies such as those with HELLP syndrome or severe pre- or eclampsia/eclampsia, TTP, HUS, or acute fatty liver of pregnancy. In all forms of thrombocytopenia, monitoring the mother's platelet count should be regular throughout prenatal

Mode of delivery was determined by maternal and obstetric indications alone. Caesarean section was performed in 94% of the patients, rest were delivered vaginally (6%). In my study the commonest cause of thrombocytopenia in pregnancy is gestational thrombocytopenia accounting for 72% and the next visits to ensure early diagnosis and a positive feto-maternal outcome All moms with thrombocytopenia should have their newborns' platelet counts checked.

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Original Article

Maternal near Miss cases At Holy family hospital: An analysis To Improve Maternal Care

Saleema Rehman[1], Humaira Bilqis[2], Sadia Khan[3], Shagufta Saeed Sial[4], Andleeb Khalid[5]

[1,5]Postgraduate Resident,
[2]Assistant Professor,
[3]Associate Professor,[4]Professor & Dean,

[1,2,3,4,5]Department of Obstetrics & Gynaecology,Unit I, Holy Family Hospital (HFH), Rawalpindi

Author's Contribution

[1] Conception of study
[2,4] Experimentation/Study conduction
[3] Analysis/Interpretation/Discussion
[1,3] Manuscript Writing
[2] Critical Review
[3,5] Facilitation and Material analysis

Corresponding Author

Dr.Saleema Rehman, Post graduate resident, Gynaecology Unit 1, Holy Family Hospital

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Abstract

Objective: the number of maternal near miss (MNM) instances seen at Holy Family Hospital, the factors contributing to them, and the treatments that have been implemented (HFH).

Materials and Methods: Descriptivee cross-sectional study

Duration of study: 6 months (1st Feb 2020 to 31st July 2020)

Setting: Department of Obstetrics and Gynaecology Unit I, HFH

All MNM cases were identified on the basis of WHO criteria and were analyzed for all parameters according to causes and interventions. Maternal near miss indicators were calculated by using the WHO based formulae.

Results: A total of 86 instances of MNM were found throughout the six-month research period. There were 4761 births, with a total of 4731 live births and 19 maternal deaths, out of which there were 4731 live births. There were 18.17 maternal near-misses per 1,000 live births, according to the data. Mortality index was 0.18, and the maternal near-miss-to-mortality ratio was 4.5:1. Haemorrhage (44 percent) and hypertensive obstetrical emergency (22 percent) were the two most common causes of MNM complications. Near-miss patients required ICU hospitalizations (52%), large blood transfusions (50%) laparotomies (25.5%), and dialysis (25.5%) as critical treatments (18.6 percent).

Conclusion: Successful outcome in MNM cases and saving maternal death is a challenge for obstetricians and a big burden on hospital resources. Most of the causes of MNM are preventable. The study emphasizes on the importance of adequate antenatal care for the women of reproductive age.

Keywords: *Severe acute maternal morbidity, maternal near-miss, severe maternal outcome*

Introduction

Pregnancy complications, delivery, or the first 42 days after the termination of pregnancy are all considered maternal near-misses. Almost all women who survive life-threatening illnesses (such as organ failure) are considered near-miss instances (1).

Development nations have greater rates of MNM because of factors such as hemorrhage, high blood pressure, and sepsis, all of which are linked to maternal mortality. For collecting meaningful data on maternal health, researchers have suggested using the maternal near-miss concept and criterion-based clinical auditing (1, 2). Sustainable Development Goal 3.1 calls for a worldwide maternal death rate of 70 per 100,000 live births or below by 2030. (3). Researchers have discovered that MNM instances are often a preventable prelude to maternal death, therefore the WHO advises that the MNM method be included in all national programs to enhance maternal health. The detection of potential healthcare system flaws at various levels may help decrease catastrophic maternal outcomes for these women. Research shows that pregnant women come to health care facilities under very stressful circumstances, leaving little room for their proper treatment, resulting in maternal mortality (4).

A better knowledge of the prevalence and type of MNM cases in public sector tertiary level hospitals may come from our research of MNM cases, which may help to enhance maternal health.

Materials and Methods

This was a descriptive cross sectional study conducted in the department of Obstetrics and Gynaecology Unit I HFH for a duration of 6 months. This is a 960 bedded tertiary care hospital, with ICU, HDU facility and 24 hours blood bank services

Inclusion Criteria

All patients of reproductive age admitted in the facility during pregnancy, delivery or within 42 days of delivery or termination of pregnancy with serious morbidity according to the WHO definition of MNM.

Exclusion Criteria

Patients who expired during the course of treatment.

Not included in the MNM group were women with a pregnancy-related problem who had normal laboratory values and/or patients admitted to the hospital for postoperative monitoring but had no signs of a systemic disease or organ failure before the surgery.

Near miss patients were selected from hospital medical records with permission from relevant authorities, and MNM was diagnosed using WHO near miss criteria. Before beginning this research, I received approval from the institution's ethical review committee.

We tracked the total number of births, the number of healthy babies born, and the number of women who died while giving birth. On the basis of WHO formulas, near miss indicators were developed. In all MNM instances, complications arose and interventions were carried out.

Data like as age, gestational age, and parity were analysed quantitatively using the aforementioned methods. Quantitative factors (causes, complications, and treatments) were analysed by calculating the frequency and percentages. SPSS 23 was used to analyse the data. The WHO-based formulas used to compute MNM indicators were used. The primary outcome measure was the frequency of MNM cases, while the secondary outcome measure was the number of pregnancies ending in death. The ratio of maternal near-misses to deaths was computed to assess the quality of care provided. Maternal near-miss (MNM), maternal death (MD), severe maternal outcome ratio (SMOR = MNM+ MD per 1000 live births), maternal near-miss (MNMR = MNM per 1000 live births), maternal near-miss: mortality ratio (MNM: 1MD), and mortality index (MI = MD/(MNM + MD)) were all calculated as part of the analysis.

Results

A total of 86 MNM cases were identified over the study period of 6 months on the basis of organ dysfunction WHO near miss approach (Table.1). Out of 86 MNM cases 73(85%) were non booked and 13(15%) were booked in their last trimester having only two to three visits in HFH. There were 4,761 deliveries, out of which total live births were 4,731. Total maternal deaths were 19. The maternal near-miss incidence ratio was 18.17 per 1000 live births. Severe maternal outcome ratio (SMOR) was 22 per 1000 live births. Maternal near-miss to mortality ratio was 4.5:1 and mortality index was 0.18 (Table.2).

Haemorrhage (44%) was the leading cause followed by hypertensive obstetrical emergency (22%) in MNM cases (fig.1, Table.3).

Critical interventions needed in near-miss patients included ICU admissions 52%, massive blood transfusion 50%, laparotomy 25.5% and dialysis 18.6% (Table.4).

Table.1 : The WHO set of severity markers used in maternal near-miss assessments.[1]

Organ Systems	Group A	Group B
Cardiovascular dysfunction	• Shock • serum lactate>5mmol/L or >45mg/dl	• pH<7.1 • Use of continuous vasoactive drugs • Cardiac arrest • CPR
Respiratory dysfunction	• Acute cyanosis • Respiratory rate > 40 or < 6/min • SPO2 < 90% for ≥ 60mins	• Gasping , PaO2/FiO2<20 mmHg • Intubation and ventilation not related to anesthesia
Renal dysfunction	Oliguria non-responsive to fluids or diuretics	Creatinine ≥ 300 mmol/l or ≥ 3.5 mg/dl Dialysis for acute renal failure
Coagulation /haematological dysfunction	Clotting failure Transfusion of ≥ 5 units of blood / red cells	Acute thrombocytopenia (<50 000 platelets)
Hepatic dysfunction	Jaundice in the presence of Pre-eclampsia	Bilirubin> 100 mmol/l or 6.0 mg/dl
Neurological dysfunctions	Metabolic coma (loss of consciousness and the presence of glucose and ketoacids in urine) •Stroke • Status epilepticus /Uncontrollable fits / Global paralysis	Coma / loss of consciousness lasting 12 hours or more
Uterine dysfunction	Hysterectomy due to infection or haemorrhage	

Table.2: Maternal near miss indicators

MATERNAL NEAR MISS INDICATORS	INDICES
Total number of MNM cases	86
Total number of maternal deaths	19
Maternal near miss incidence ratio	18.7/1000 live births
Maternal mortality ratio	401.6/100000 live births
Severe maternal outcome ratio	22/1000 live births
Mortality index (%)	18%
Maternal near miss to mortality ratio (MNM:MD)	4.5:1

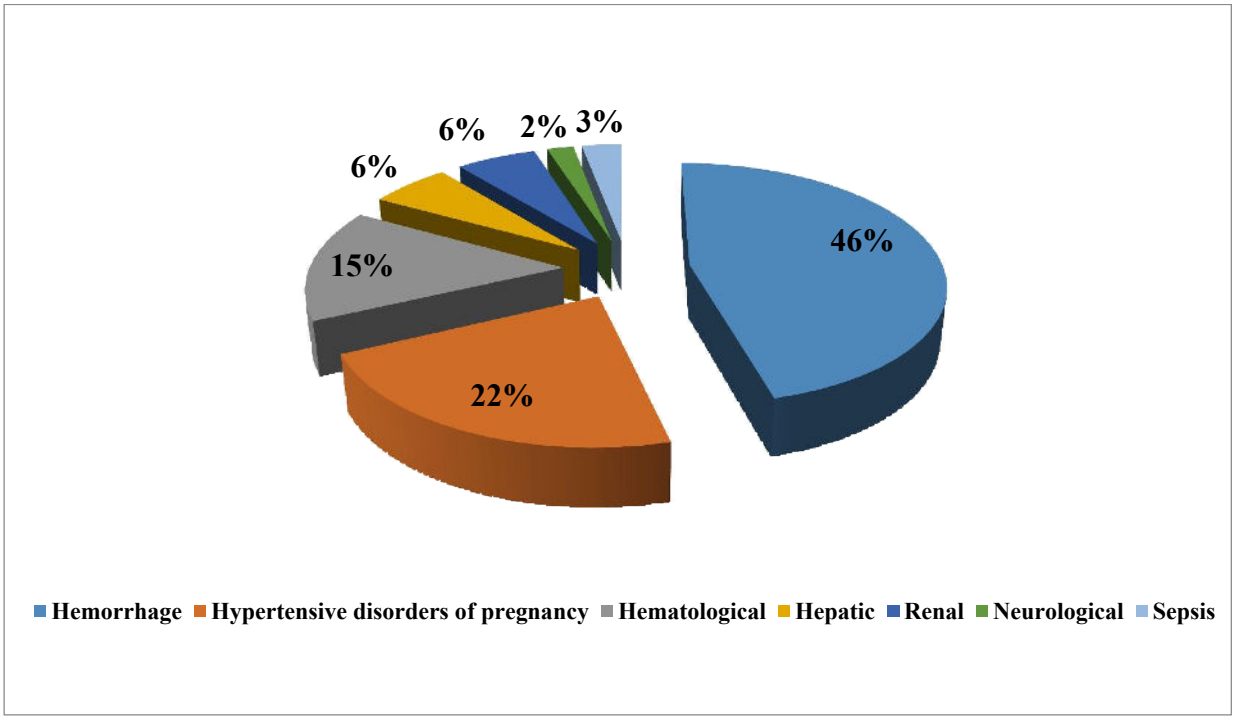

Fig.1: Frequency of MNM cases at HFH

Table.3: Causes of MNM (n=86)

NEAR MISS CASES	n (%)
HEMORRHAGE	**40 (46%)**
Early Pregnancy	
Ectopic pregnancy	4 (4.6%)
Septic induced abortion	2 (2.3%)
Late Pregnancy	
Abruption	3 (3.4%)
PPH	22 (25.5%)

Placenta previa/Accreta	5 (5.8%)
Ruptured uterus	4 (4.6%)
HYPERTENSIVE DISORDERS OF PREGNANCY	**19 (22%)**
Severe preeclampsia	6 (6.9%)
Eclampsia	13 (15.1%)
RESPIRATORY DYSFUNCTION	**2 (2.3%)**
Acute cyanosis	1 (1.1%)
Severe tachypnea (R/R>40/min)	1 (1.1%)
RENAL DYSFUNCTION	**2 (2.3%)**
Oliguria not responding to fluids or diuretics	2 (2.3%)
HEMATOLOGICAL DYSFUNCTION	**13 (15.1%)**
DIC	1 (1.1%)
Severe thrombocytopenia <50,000 PLT count	2 (2.3%)
Severe anemia/Massive blood transfusion > 5 units of blood	10 (11.6%)
HEPATIC DYSFUNCTION	**5 (5.8%)**
Severe acute hyperbilirubinemia (STB >6mg/dl)	5 (5.8%)
NEUROLOGICAL DYSFUNCTION	**2 (2.3%)**
Uncontrolled fits/ status epilepticus	1 (1.1%)
Stroke	1 (1.1%)
SEPSIS	**3.4% (3)**

Table.4: Critical interventions needed in MNM cases

Interventions	**n (%age)**
ICU admission with ventilatory Support	45 (52%)
Ionotropic Support	6 (6.9%)
Massive blood transfusion	43 (50%)
Laparotomies (including life saving peripartum hysterectomies and excluding caesarean section)	22 (25.5%)
Need for dialysis	16 (18.6%)

Discussion

Maternal mortality is an important indication of maternal health, although it performs poorly in countries with little resources. Previously, healthcare planners utilised the maternal death rate to evaluate the quality of obstetric services in a particular region, but today the emphasis is on maternal near-miss as a more useful indication of mother health than maternal mortality (1, 2). Earlier this year, a WHO expert panel approved criteria based on organ system failure or malfunction as the norm for recognising close calls (1). An investigation was conducted at Holy Family Hospital's Obstetrics and Gynecology Department using WHO near-miss criteria based on organ malfunction or failure to identify the frequency, causes, and treatments in MNM cases.

Table 2 lists the number of MNM instances found in the research, including the 19 maternal fatalities. The MNMR (number of maternal near-miss cases per 1,000 live births) was estimated in our research at 18.7 based on the findings and subsequent analyses. Worldwide, developed

countries have been reported to have a lower MNM incidence ratio as compared to the developing countries. The MNMR thus depends upon the availability of resources in order to overcome the complications that may arise. Globally the average of MNMR is reported at 18.67 [16], which our study's result aligned with. Another study of the region carried out at Combined Military Hospital Kharian, a ratio of 70.3 was reported(5). In studies conducted in other countries, the incidence of the MNM was 198, 54.8, 19.9 and 7.8 in Nigeria, Brazil, India and South America respectively(6-9). Developed countries as compared to developing countries have lower incidence probably due to improved maternal health(9-11).

Health resources available in that region or institution, as well as the quality of health care provided, are reflected in the maternal mortality ratio (MMR) and mortality index (MI). Our research found a maternal mortality ratio of 401.6/100,000 live births, which is greater than the 313/100,000 live births found in studies done in India by Roopa et.al (12). Despite the fact that Ansari and colleagues' research from 2016 in Kharian, Pakistan revealed an MMR number of 676, which was higher than ours (5). Mortality index is a measure of how many patients who are facing life-threatening illnesses will die as a result of such conditions. Higher numbers imply that more women with life-threatening illnesses die as a result of poor treatment, whereas lower numbers suggest the opposite (5, 8, 13, 14). When discussing about the mortality index (MI), our study reported 18% MI. The higher the MI, the greater the chances of women dying as a cause of life-threatening conditions. Our study reported a comparatively lower MI when compared to the study by Mansuri and Mall in 2019 that had MI of 24.23% (15). On the contrary, some other studies reported a much lesser MI, such as Roopa *et.al.,* Das *et.al.* and Madhavi *et.al* reported 14.9%, 9.17% and 8.3% MI in their respective studies suggesting a better survival rate of women in life threatening conditions as compared to our study (12, 16, 17).

An MNM:MR ratio greater than one implies superior treatment since more women escaped a life-threatening critical condition, which is a measure of maternal near-misses compared to maternal fatalities. MNM:MR ratios of 4:1, 5.8:1, and 11:1 have been found in research performed in India(8), Ethiopia(18), and Brazil(6), respectively, in poor nations. The MNM:MR ratio in our research was 4.5:1, which is in line with the results of the majority of other investigations. These nations' insufficient health facilities and services are most likely to blame for the poor survival rate. Developed nations have a far greater ratio of 117-223:1 than poor countries, indicating better maternal health care (19).

In our research, the severe maternal outcome ratio (SMOR) was 22 per 1000 live births, referring to the number of women who had life-threatening illnesses, including death. Military hospitals throughout the country reported an infection rate of 83 per 1,000 live births in a comparable research (5). In order to better understand the quantity of care and resources required in a particular region or institution, the MNMR and SMOR formulas are used to estimate such needs.

More women suffer and die in poor nations like Pakistan than in developed ones, mostly because of inadequacies in the management of obstetric crises at different levels in underdeveloped countries (5). Poor obstetric emergency treatment in underdeveloped nations may be traced to three delays in obtaining prompt medical attention. The first delay occurs when women and their families are unaware of their symptoms, which causes them to put off seeking medical attention. Getting to health care facilities takes longer when there are transportation, financial, or social problems involved. Medical facilities experience a third delay when severe problems go undiagnosed for

long periods of time or when there aren't enough resources or qualified health care providers available (4, 5, 8). Near-miss patients in our research had one or more organ dysfunctions upon admission, indicating that the first and second delays may be the primary cause of our study's high morbidity. On examining this aspect. In addition to this, approximately 85% of near-miss incidents were not reported (no prior antenatal visit).

The causes of maternal near-miss give information about the neglected area which needs to be more vigilantly investigated and monitored for better maternal outcome. In our study, the leading cause of maternal morbidity was hemorrhage reported in 46% of the cases followed by hypertensive disorders that constituted 22% of all the cases. The same results were shown by studies done in Pakistan and India with hemorrhage as the leading cause followed by hypertension which are in line with the results presented in our study(5, 13).Considering study population and characteristics were closely related in these studies, the results are expected to show a similar pattern. A study in Zimbabwe, Africa by Chikadaya also reported the most common complication to be hemorrhage at 31.85 followed by hypertensive disorders at 28.2% (20). Studies done in different countries (Nigeria, Brazil and Ethiopia) have shown that hypertensive disorder of pregnancy was the leading cause of all near miss cases (6, 7, 18).

Hematological complications were the third most prevalent in our sample cohort with 15% of patients suffering from such impediments. The most common hematological conditions found in pregnant women contributing to MNM cases are related to anemia, which was found to be most common in our study too. In another study in Pakistan, 36% of the patients were reported to have hematological conditions which was higher than what was reported in our study (5). This result may be due to the high prevalence of anemia in our country.

Among critical interventions done in all cases with maternal near-miss, 52% patients required ICU admission and ventilator support while 50% patients needed massive blood transfusion (more than 5 units of red blood cells), which emphasizes upon more need for intensive care units, ventilators and functional blood bank services. On the contrast, a study conducted in the neighboring India has quoted that 34.3% of patients required massive blood transfusion and 7.2% patients needed ventilator support for mechanical ventilation(21).

Community resources must be improved along with public understanding of the need of prenatal care. To better manage maternal difficulties, healthcare professionals at primary and community health centres may need training. The government should take steps to improve the system for sending ill patients to more advanced facilities.

Conclusion

On entrance to the hospital, the vast majority of near miss cases were very sick and had pre-existing organ failure, indicating they had delayed seeking appropriate treatment or reaching the medical institution on time. Finally, the results of the MNM study shed light on the gaps in maternal health care. Preventing maternal fatalities begins with prompt, suitable, and sufficient treatment.

Recommendations

In order to improve near miss outcome as depicted by low MNM:MD ratio, we require more manpower, well trained critical care team, well set protocols, more ICUs, well equipped blood bank and labs, more operation theatres and dialysis units. Regular clinical audits of near miss and mortality cases should be done to identify preventable factors and implementing

new protocols. At community level efforts should be done for coordinated maternal services and efficient timely referral system.

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Original Article

Pathological Response after Neoadjuvant Chemoradiotherapy in Locally Advanced Rectal Cancer: Experience of Our Institute

Asif Masood[1], Aatiqa Arjumand[2], Friha Razzaque[3], Nimra Riaz[4], Kashif Mahmood[5]

[1, 2, 3]Department of Radiation Oncology, SHIFA International Hospital, Islamabad, Pakistan
[4]Research Officer Bone Marrow Transplant Center, Combined Military Hospital, Rawalpindi, Pakistan
[5]Medical Physicist, Shifa International Hospital, Islamabad, Pakistan
.

Author's Contribution

[1,2,3] Conception of study
[1,3] Experimentation/Study conduction
[1,2,4] Analysis/Interpretation/Discussion
[2,3] Manuscript Writing
[1,2] Critical Review
[5] Facilitation and Material analysis

Corresponding Author

Dr Asif mehmood, Department of Radiation Oncology, SHIFA International Hospital, Islamabad, Pakistan

drasifmehmood@gmail.com

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ABSTRACT

Background and Objectives: Cancer of the colon (CRC) is a disease that affects a large percentage of people in Asian nations. Overall, it ranks as men's and women's third-most common forms of cancer after only prostate and lung cancer. About 30 % of people with colorectal cancer have rectal cancer. Objective of this study is to assess the pathology response to nCRT of the individuals with locally advanced rectal cancer.
Methodology: Study was conducted in Shifa International Hospital from January 2013 to December 2016. 30 patients of biopsy proved rectal cancer were treated. Ethical Review Board of Shifa International Hospital gave its ethical approval. Patients aged 17-70 years with ECOG performance status of 0, and locally advanced rectal cancer (T3/T4, or N+) were all eligible for the study. The 8th version of the American Joint Committee on Cancer's Guidelines for cancer staging was used (AJCC). Microsoft excel 2017 was used to create a database with all the data that was collected. Statistical analysis was performed by SPSS-16. When applicable, categorical variables were compared using the Chi-square test or the Fischer exact test, which presented them as percentages. Student's t-tests described normally distributed data as mean standard deviation.
Results: A total of thirty patients were included in our study with biopsy proven diagnosis of rectal cancer with male to female ratio of 1.5:1.0. Approximately 53% of patients were younger than 40 years of age. The median age was 41 years. Majority patients (60%) were T3N+. Clinically 86% of patients got disease in lymph nodes. More than 40% of cases have tumour located within 5-10cm from the anal verge which showed that in majority of the patients middle third of the rectum was primarily involved. All the patients received nCRT according to the designed protocol. The time lapse between the end of nCRT and curative surgical resection was 6-10 weeks. In this study 66% of patients underwent LAR. After surgery pathological specimen of 50% of patients showed moderate differentiation and 50% of histology showed adenocarcinoma. Second common histology in the present study was signet ring cell adenocarcinoma (26.6%). Post neo-adjuvant therapy histological assessment showed RCRG-III in 60% of sample, RCRG-II in 33% and RCRG-I in only 6% of cases.

Conclusion: In young individuals, incidence of Signet ring adenocarcinoma and mucinous adenocarcinoma was greater due to which pCR rates were lower.

Introduction

Cancer of the colon (CRC) is a disease that affects a large percentage of people in Asian nations. Overall, it ranks as men's and women's third-most common forms of cancer after only prostate and lung cancer. 1 About 30% of people with colorectal cancer have rectal cancer. 1 Colorectal cancer is not distributed evenly across the globe, with higher rates in the United States, Australia, and Europe, and lower rates in Africa and Asia.[1] It is a multifactorial disease and various factors can be considered as causative agents comprising of environmental, genetic and dietary factors.[2]

Trend has been changed in the presentation, treatment and response of rectal cancer to treatment over a few decades. The high mortality and aggressive behaviour of this ailment forced people to keep searching for better combined modality therapies in order to have a better local pathological response rates which has clinical implications on overall and disease-free survival. This search includes better choice of therapeutic and diagnostic tools in the form of MRI and endoscopic ultrasound (EUS). Pakistan has a low risk of colorectal cancer, but there is no reliable data on the incidence and prevalence of different kinds of malignancies in the country since there is no national cancer registry. The male-to-female cancer ratio in Pakistan is 1.8:1.0, according to a recent local research on the subject of colorectal cancer.3,4 It's important to note, however, that in Pakistan, the incidence and mortality of colorectal cancer have both increased owing to the earlier stage and larger size of the illness when it first presents. Changes in eating patterns, the westernisation of cuisine, and specific genetic mutations may all be contributing factors. 5,6

Rectal cancer was once thought to be disease of late fifties. Contrary to that recent local study has shown that rectal cancer is increasing drastically in younger population and genetics play a very important role in determining the risk factors.[7] CRC has established association with certain benign lesions such as villous adenoma, polyps and familial syndromes. They act as precursors of CRC. Syndromes that are associated with CRC include familial adenomatous polyposis (FAP) and Lynch syndrome. Such forms of CRC have early onset, proximal location, poor differentiation and mucinous histology commonly.[8, 9, 10]

There is a paradigm shift towards approaching patients of rectal cancer starting from upfront surgery followed by consideration of preoperative radiotherapy finally taking help of chemotherapy in addressing the issues of lymphatic and distant systemic spread. The approach to such patients has been revolutionized in the last few decades. This interdisciplinary approach to cancer treatment necessitates the involvement of radiologists, surgeons, medical oncologists, and radiation oncologists. Magnetic resonance imaging (MRI) and endoscopic rectal ultrasound (ERUS) have been incorporated into the staging process to provide more accurate and reliable information about the perirectal area, circumferential resection margin (CRM), extramural vascular invasion (EMVI), and lymph node involvement. The staging procedure has been modified. 11

When treating individuals with rectal adenocarcinoma, it is important to provide both local and systemic therapy options. Improved treatment options include complete mesorectal excision (TME) and neoadjuvant chemotherapy and radiation (nCRT). Neoadjuvant CRT has been shown in many trials to enhance local control and overall survival. It is a beneficial new approach. In cases of locally advanced rectal cancer (T3/T4 and/or N+ tumours), pre-operative CRT followed by TME adjuvant chemotherapy has therefore become the gold standard treatment. By using nCRT, the tumour

is reduced in size, allowing surgeons to do a lower anterior resection (LAR) instead of an abdominoperineal resection (APR), saving the sphincter and enabling these patients an easier time living without a stoma. There is a wide range of tumour response, ranging from pathological complete response (pCR) to no response or progressing illness (PD).

In this research, individuals with locally advanced rectal cancer will have their pathology response to nCRT assessed.

Materials and Methods

Patient Selection

Table 1: Demographic Details and Patient Characteristics

Characteristics	n= 30 (%)
Gender	
Male	18 (60)
Female	12 (40)
Age (years)	
Range	17-66
Median	41
<40	16 (53.33)
>40	14 (46.66)
Stage At Presentation	
cT3N0	8 (26.6)
cT4N0	4 (13.3)
cT3N+	18 (60)
Distance from Anal verge	
2cm	1 (3.33)
2-5cm	10 (33.33)
5-10cm	12 (40)
>10cm	7 (23.33)
Surgery	
Abdomino-perineal resection	10 (33.33)
Lower Anterior Resection	20 (66.66)
Histology	
Adenocarcinoma	15 (50)
Mucinous Adenocarcinoma	7 (23.33)
Signet ring Cell Adenocarcinoma	8 (26.66)
Grade	
Well Differentiated (G-I)	13 (43.4)
Moderately Differentiated (G-II)	15 (50)
Poorly Differentiated (G-III)	2 (6.6)
Interval of NACRT to Surgery	
6 weeks	11 (36.66)
8 weeks	17 (56.66)
10 weeks	2 (6.66)
RCRG	
1	2 (6.66)
2	11 (36.66)
3	18 (60)

From January 2013 to December 2016, the SHIFA International Hospital Islamabad, Pakistan, treated thirty patients with biopsy-proven diagnosis of rectal cancer. The

institutional review board of SHIFA International Hospital gave its ethical approval. patients aged 17-70, with an ECOG performance status of 0, and locally advanced rectal cancer (T3/T4, or N+) were all eligible for the study. Preoperative digital rectal examination findings were documented for all patients. Proctoscopy/colonoscopy was done to find out where the anal verge tumour was located. This protocol's pre-treatment clinical staging tools comprised MRIs of the pelvis, chest X-rays and/or CT scans, and abdominal ultrasounds and/or CT scans. The 8th version of the American Joint Committee on Cancer's guidelines for cancer staging was used (AJCC). Microsoft Excel 2017 was used to create a database with all the data that was collected.

Treatment Protocol:

3D-conformal radiation (3D-CRT) was used to administer pelvic radiotherapy (RT) together with 825mg/m2 capecitabine. The patient had a CT scan of the pelvis and urinary bladder in three-millimeter slices on the other hand. A list of organs that are particularly vulnerable (OARs) was created. Each axial slice of the CT scan had the target volumes carefully contoured. The total tumour volume (TTV) comprised both the main tumour and the lymph node that had been impacted by it. In order to encompass high-risk areas, the GTV was increased by 0.5cm (CTV). When geometrical errors were taken into account, an extra 0.5-1 cm of CTV was added to achieve the desired planning volume (PTV). The recommended dosage was 45-50.4 Gy administered over five weeks in 25 daily portions of 1.8-2Gy. The beam has a power range of 6 to 15 MV. Dose distribution and calculation were performed using Eclipse treatment planning version 13.5. After chemoradiation, patients were given a six- to ten-week break before surgery. Patients were re-staged by MRI pelvic after a 6- to 10-week break, and comparative studies were conducted to determine the impact of local chemoradiotherapy on survival. Following that, patients' surgeries were scheduled. Treatment options included lower anterior resections or abdomino-perineal resections, depending on the location of the tumour and its response to treatment. The existence of a tumour or live malignant cells, the degree of invasion, and the number of affected lymph nodes in the postoperative material were all determined using a modified pathological staging method, and the ypTNM stage was recorded. There was a record of all patients' RCRG (Rectal Cancer Regression Grade). In order to classify patients into three categories, the RCRG was utilised: Either the tumour has been sterilised or just tiny foci of still-viable tumour have been discovered using the RCRG-I technique There is significant fibrosis, but there is still a macroscopic tumour present in the RCRG-II. When there is a large amount of macroscopic tumour, the RCRG-III shows little to no fibrosis. RCRG I and II show a substantial decrease in tumour size.

Statistical Analysis:

Statistics Package for Social Sciences (SPSS) 16 was used to input and analyse data. The results of the correlation analysis were presented. When applicable, categorical variables were compared using the Chi-square test or the Fisher exact test, which presented them as percentages. Student's t-tests described normally distributed data as mean standard deviation.

Results

A total of thirty patients were included in our study with biopsy proven diagnosis of rectal cancer with male to female ratio of 1.5:1.0. Approximately 53% of patients were younger than 40 years of age. The median age was 41 years. Majority patients (60%) were T3N+. Clinically 86% of patients got disease in lymph nodes. More than 40% of cases have tumour located within 5-10cm from the anal verge which showed that in majority of the patients middle third of the rectum was primarily involved. All the patients received nCRT according to the designed protocol. The time lapse between the end of nCRT and curative surgical resection was 6-10 weeks. In this study

66% of patients underwent LAR. After surgery pathological specimen of 50% of patients showed moderate differentiation and 50% of histology showed adenocarcinoma. Second common histology in the present study was signet ring cell adenocarcinoma (26.6%). Post neo-adjuvant therapy histological assessment showed RCRG-III in 60% of sample, RCRG-II in 33% and RCRG-I in only 6% of cases.

Discussion

According to our research, colorectal cancer has a male to female predominance of 1.8:1.0 in Pakistan, making it one of the top five malignancies.3, 4 More over half of the patients in this research were under 40, according to the findings. On the basis of these findings, the researchers concluded that colorectal cancer is more common in the younger population, with worse outcomes and a worse response to therapy. 7

Treatment of locally advanced rectal cancer with a multimodal strategy has opened up new possibilities in the field of rectal carcinoma therapy. The 5-year survival rate for patients with locally advanced rectal cancer has been reported to be 45-75% despite the use of nCRT, with failure occurring in 5%-15% of the patients. 12

A strange nation, Pakistan has its own unique environmental elements. It's possible that cancer's genetic make-up and behaviour differ among Pakistanis and Americans and Europeans. There is a paucity of clinical data on the many features of this disease in our community. The current research seeks to identify the pathological response of nCRT in our clinical context in locally advanced rectal cancer.

Patients who undergo preoperative CRT with a conventional protocol have a significant reduction in tumour size (15–27 percent) and achieve pathological complete response (pCR), which is determined by the absence of disease on histological analysis of tissue from the tumour microenvironment (TME).

13 Meta-analysis of 3105 patients revealed a predictive significance for this post-nCRT pCR. A five-year crude disease survival rate of 83% was found in this research for patients who received pCR following neoadjuvant chemotherapy, compared to 66% for those who did not (p0.0001). Similarly, pCR patients had an 89 percent five-year distant metastasis-free survival rate compared to the non-pCR group's 75 percent (p 0.0001). 13

Different histologies of rectal cancer respond differently to nCRT, which has an impact on the patient's prognosis and overall survival time. Classic adenocarcinomas account for almost all cases of rectal cancer. Rare histologies classified by the WHO include mucinous, signet ring cell, medullary, micropapillary, serrated, cribriform, comedo-type, spindle-cell, adenosquamous, and undifferentiated forms of tumour. Compared to conventional adenocarcinomas, these uncommon histological variations have a distinct biological behaviour. Rectal tumours were shown to have high rates of mucinous and signet ring cell subtypes in our present research. Literature suggests that the general incidence of signet ring cell adenocarcinoma is 1-13 percent, however our study found that in post-operative tissues, 26% of patients had this morphology. fourteen, fifteen, and sixteen According to one research, individuals with rectal cancer that has a signet ring cell histology are more advanced when they first appear, and this is supported by the current study, which found that almost all of the patients had T4N+ illness when they were diagnosed. 15,16 nCRT responsiveness is low and surgical results are poor when patients have signet ring cell histology. Our present research, in which 75% of patients responded to nCRT by showing RCRG-III, illustrates this.

Rectal tumours that are histologically classified as mucinous account for 10% To 20% of all cases. Mucinous histology was seen in 23% of participants in this research. There is conflicting information on the prognosis of mucinous rectal cancer. Studies have shown that the mucinous

type responds poorly to nCRT and has poorer results as a result. a number between 17 and 18 As shown in our current research where 71% of patients exhibited RCRG-III and only 28.5% showed RCRG-II while none showed a full response in the post-operative material, Shin et al. found that patients with mucinous rectal cancer had a reduced incidence of T-downsizing after receiving nCRT. a number between 19 and 20 Mucinous rectal cancer has been shown to have no impact on prognosis in a research done in Singapore with Asian participants. Twenty-one and two

The use of nCRT to reduce tumour size has sparked a fresh round of discussion about when and how to operate on these patients to get the most out of nCRT treatment. Extending the period between nCRT and surgery may enhance pCR rates and consequently improve survival outcomes when neoadjuvant treatment is intensified. Guidelines from the National Comprehensive Cancer Network (NCCN) suggest waiting 5-12 weeks after nCRT before having surgery. 23 A phase-III randomised GRECCAR-6 study compared a 7-week delay to surgery with an 11-week wait. The group who had laproscopic surgery at 11 weeks had a high percentage of conversion. Eighty-six per cent as opposed to ninety-five per cent However, the group that had surgery at 11 weeks had a greater incidence of wound complications. Numbers 24, 25, and 26 Surgeons may encounter greater intraoperative difficulties and after surgical problems, such as anastomotic leakage and wound infection, following nCRT, according to the available research. 30, 21, 22, 23, 24, 25, 26, 27 On the other hand, another research based on the US National Cancer Institute's database showed that a 56-day interval between the end of nCRT and surgical resection was optimum for reducing tumour staging while maintaining the same incidence of surgical complications and morbidity. 26 In our present research, the majority (56%) of patients had surgery within 8 weeks after the previous operation, and there were no severe postoperative problems.

nCRT-induced complete tumour remission is linked with increased survival and a reduction in local recurrence. In contrast to our study30, Belluco et al observed pCR frequencies of 12 percent to 38 percent in individuals who underwent nCRT. Rectal cancer behaviour in our geographical area differs from that in other parts of the globe. This may be for a variety of reasons. Second, most of the patients were under 40 and had an aggressive form of the illness, as has been documented in the scientific literature. 7 Three times as many cases had histology that was associated with mucinous or signet ring cells, which are known for responding poorly to nCRT. Numbers 15, 16, 17, and 18 In order to establish if the cancer has spread locally and distantly, as well as to assess how long these patients will remain disease-free, it is necessary to monitor these patients throughout time. Adenocarcinomas make up the vast majority of the data, with very little information available on the pathological response of other histologies.

pCR has been shown in many studies to be a proxy for prolonged overall life and disease free survival.31, 32, 33 The primary objective of nCRT is to increase the pCR rate. Several variables, including as CRM, original tumour size, histological type, and stage at first presentation, are investigated to predict pCR following nCRT in locally advanced rectal cancer. Less tumour regression was seen in our present study as compared to previous studies, indicating a need for more research into the underlying causes of this resistant behaviour. Here, neoadjuvant treatment may need to be modified and intensified. Above all, this research shows that tumours with mucinous and signet ring cell histology appearing in younger populations require a robust prospective assessment with a more intensive chemoradiotherapy regimen and more aggressive curative surgical resections in order to improve pCR rates and indirectly improve survival outcomes...

Younger people being diagnosed with rectal cancer has a strong link to genetic abnormalities,

according to new research. It was found in the second phase of the Grimminger study that levels of mRNA expression of epidermal growth factor (EGFR) as well as vascular endothelial growth factor (VEGF) as well as K-ras and B-raf mutation status could be used as molecular markers to predict the pathological response to neoadjuvant cetuximab-based chemoradiation in patients with locally advanced rectal cancer. 34 There is a good chance that newer therapeutic methods, such as targeted treatments and the use of check point inhibitors, may open new doors and revolutionise the treatment of this cancer very soon.

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Original Article

Communication skills of Postgraduate residents using Health Professionals Communication Skills Scale

Shariq Iqbal Rai[1], Naeem Liaqat[2], Noor Ul Sabah Butt[3], Shoaib Hasan[4], Ayesha Anwar[5], Muhammad Haider[6]

[1,] Post graduat trainee, department of Pediatric Medicine, Benazir Bhutto Hospital, Rawalpindi
[2]Assisstant professor, Department of Pediatric Surgery, Holy Family Hospital, Rawalpindi
[3,4] Post graduate trainee, Department of pediatric surgery, Holy Family Hospital, Rawalpindi
[5]House officer, Department of Pediatric Surgery, Holy Family Hospital, Rawalpindi
[6]Registrar, Department pf orthopedics, Holy Family Hospital

Author's Contribution
[1,2,4]Conception of study
[2,3] Experimentation/Study conduction
[3] Analysis/Interpretation/Discussion
[1,3] Manuscript Writing
[2,3,6] Critical Review
[3,5,6] Facilitation and Material analysis

Corresponding Author
Dr. Noor ul Sabah Butt
Post graduate trainee, department of Pediatric Surgery, Holy Family Hospital, Rawalpindi
Dr.noor2712@gmail.com

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Abstract

Objective: To determine the communication skills level of Postgraduate residents (PGRs) working in Rawalpindi Medical University (RMU) using Health Professionals Communication Skills Scale (HP-CSS).
Methods: This cross-sectional study was conducted at RMU over a period of one month in January, 2020. All PGRs working at RMU were included in the study. For communication skills assessment, HP-CSS was used, which is an 18-question scale, reported on a Likert scale. It assesses communication skill in four subscales: informative communication, empathy, social skills and respect. Data was analyzed using SPSS 26.
Results: Of the 191 respondents, 105 (54.9%) were satisfied with their communication skills level. Overall HP-CSS score was significantly higher among those who had attended communication skills workshop (p=0.02), among nonsmokers (p=0.038), those who were satisfied with their communication skills (p=0.001) and those who would like to be addressed in the same manner as they had addressed the patient (p=0.001). Among subscales of HP-CSS, informative communication was significantly higher among nonsmokers (p=0.049), who had attended communication skills workshop (p=0.017) and who were satisfied with their communication skills (p=0.012). Also, empathy was significantly higher among those who were satisfied with their communication skills (p=0.004). Respect was found significantly higher among those who were engaged (p=0.03), those who had attended communication skills workshop (p=0.001) and those who were satisfied with their communication skills (p=0.017). Social skills were significantly higher among medicine and allied residents (p=0.04), those who were non-boarders (p=0.047) and who were satisfied with their communication skills (p=0.001)
Conclusion: In general, CS were better among those who had attended its workshop and among non-smokers.

Introduction

Educating patients and their families adequately about their disease and the outcome is prime duty of healthcare providers. Efficient communication skills are useful in managing difficult clinical encounters and thus decrease the frustration of both the doctor and the patient or attendant in situations of emotional outbursts. Fostering the relationship with patients, gathering information, providing information and responding to emotions, constitute the best practice for physician communication in medical encounters. Importance of proper communication with patients and their families is stressed upon by medical educators and patient advocates [1-3]. Communication skills has become an explicit component of medical education curricula for physicians in the United States [1].

Good communication skill is the essential quality of every physician and all healthcare workers which cannot be over-emphasized. The good communication skills have a decisive impact on the doctor–patient and doctor–care-givers relationships [2, 4]. A survey conducted on perceptions and skills amongst postgraduate residents (PGR's) regarding breaking bad news at teaching hospitals in Peshawar, Pakistan concluded that formal structured training in breaking bad news, an essential component of communication skills, is lacking both at undergraduate and postgraduate levels in Pakistan and structured training programs for residents can do the task effectively [5]. A study conducted at a tertiary care hospital to analyze communication skills of pediatric PGR's in clinical encounter by using video recordings concluded that pediatric PGR's were polite while communicating with parents and child but lacking in good non-verbal communication skills [6]. Another study recommended incorporation of communication skills in residency programs since this can enhance residents' performance as effective health care providers [7]. The aim of the study was to determine the communication skills level of PGR's working in RMU & allied hospital. The objective of the study was to point out the specific areas which needs to be improved for effective doctor – doctor communication, effective doctor – patient communication. This study will be able to guide us for the implementation of different strategies and methods to reinforce the importance of informative communication, empathy, social skills and respect.

Materials and Methods

This cross-sectional study was conducted among PGR's in Rawalpindi Medical University (RMU), Pakistan over a period of one month in July, 2020. There are 3 allied hospitals with RMU: Holy Family Hospital, Benazir Bhutto Hospital and District Head Quarters Hospital, Rawalpindi. There are total 317 PGRs working in these hospitals. Approval from ethical committee of RMU was obtained. A questionnaire was designed and all the PGRs in these hospitals were contacted in person and were asked to fill the proforma. One of the investigators approached all PGR's in each department and those who were found absent or could not be contacted during first encounter, were contacted again after 2 days. If still any PGR was not available, he/she was not contacted again. The questionnaire was anonymous, so all the respondents were told not to write their names and signatures over the questionnaire. They were also informed that filling the questionnaire will be considered as a permission to be included into this study and no other formal permission will be taken. Our questionnaire consisted of 2 sections: 1) demographic details; and 2) Health Professionals Communication Skills Scale (HP-CSS). Regarding demographic details, following details were asked from residents: age, gender, department, marital status, whether parents are doctors or not, smoking status, residence, year of residency, whether they attended communication skills workshop or not, are they satisfied with their communication skills and would they like to be addressed in same way as they address the patient.

Second section of the proforma was HP-CSS. It is a validated and reliable tool of assessing communication skills among healthcare professionals [8]. It comprises of 18 items, which assess communication skills among health professionals in mainly 4 domains, namely,

informative communication, empathy, social skills and respect. Each of these domains was assessed on a 6-point Likert scale. HP-CSS was designed by Costa 2016 [8] and this scale was administered after getting written approval from authors. In the statistical analysis, simple descriptive statistics were used for frequency and percentages using SPSS version 26. P>0.05 was considered significant.

Results

Of 317 PGRs, 191 filled the proforma (response rate 63.3%). The questionnaire is given as Annexure A. Mean age was 27.23 years and 105 respondents (54.97%) were females. Most of the PGR's were working in Medicine & Allied department (38.74%), were single (50.26%), had attended CS workshop (65.44%) and told to be addressed in the same manner as they do (37.7%). All demographic details are summarized in table 1.

The Health Professionals Communication Skills Scale, HP-CSS© Assessment of the following dimensions of communication skills in the Health Professionals: Empathy, Informative Communication, Respect and Social Skill. Composed of 18 items, with a Likert-type scale of response, was graded into six alternatives with linguistic quantifiers of frequency: almost never, once in a while, sometimes, normally, very often, and many times. Two items were worded inversely (items 16 and 18). The positively worded items were scored as follows: Almost never = 1, once in a while = 2, sometimes = 3, normally = 4, very often = 5, and, many times = 6; The items worded inversely were scored: Almost never = 6, once in a while = 5, sometimes = 4, normally = 3, very often = 2, and, many times = 1.

It included four dimensions: 1 .Informative Communication: consisting of six items (5, 8, 9, 14, 17, and 18) that reflected the manner by which the health professionals obtain and provide information in the clinical relationship that they establish with patients. 2. Empathy: composed of five items (2, 4, 6, 11, and 12) that reflected the capacity of the health professionals to comprehend the feelings of patients and make their empathy evident in the relationship, as well as the behavioral dimension, the empathic attitude, composed of active listening and empathic response.

3.Respect: with three items (1, 3, and 15) that evaluated the respect that is shown by the health professionals in the clinical relationship they establish with patients. 4. Social Skill: with four items (7, 10, 13, and 16) that reflected the ability of the health professionals to be assertive or to exhibit socially skillful behaviors in the clinical relationship they establish with patients

Communication skills were score significantly higher among those who had attended communication skills workshop (p=0.02), among those who were nonsmokers (p=0.038), those who were satisfied with their communication skills (p=0.001) and those who would like to be addressed in the same manner as they had addressed the patient (p=0.001). Among subscales of HP-CSS, informative communication was significantly higher among nonsmokers (p=0.049), who had attended communication skills workshop (p=0.017) and who were satisfied with their communication skills (p=0.012). Also, empathy was significantly higher among those who were satisfied with their communication skills (p=0.004). Respect was found significantly higher among those who were engaged (p=0.03), those who had attended communication skills workshop (p=0.001) and those who were satisfied with their communication skills (p=0.017). Social skills were significantly higher among medicine and allied residents (p=0.04), those who were non-boarders (p=0.047) and who were satisfied with their communication skills (p=0.001) (Table 2).

A reliability analysis was carried out on the perceived task values scale comprising 18 items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.848$. Most items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted.

The two exceptions to this was item 16 and 18, which would increase the alpha to α = 0.860 and 0.865 respectively. As such, removal of these items should be considered.

Age (years)	
Range	23 – 36 years
Mean	27.23
Gender (n(%)	
Male	105 (54.97%)
Female	86 (45.02%)
Department (n(%)	
Medicine & Allied	74 (38.74%)
Surgery & Allied	67 (35.07%)
Gynae & Obs	16 (8.37%)
Paediatric Medicine	25 (13.09%)
Others	9 (4.71%)
Marital Status (n(%)	
Single	96 (50.26%)
Married	73 (38.22%)
Engaged	19 (9.5%)
Divorced	3 (1.57%)
Parents doctors (n(%)	
Yes	158 (82.72%)
No	33 (17.28%)
Smoking (n(%)	
Yes	39 (20.41%)
No	152 (79.58%)
Residence (n(%)	
Boarder	72 (37.7%)
Non-boarder	119 (62.3%)
Year of residency (n(%)	
1	53 (27.74%)
2	69 (36.12%)
3	45 (23.56%)
4	23 (12.04%)
5	1 (0.005%)
Communication skills workshop attended (n(%)	
Yes	125 (65.44%)
No	66 (34.55%)
Satisfied (n(%)	
Yes	105 (54.97%)
No	86 (45.03%)
Like to be addressed (n(%)	
Yes	72 (37.7%)
No	48 (25.13%)
May be	67 (35.07%)
Never	4 (0.02%)

Table-1: Demographic details of PGRs

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5	75.0000		27.0000		19.0000		16.0000		13.0000	
Workshop attended										
Yes										
No	77.7920	0.020	26.3040	0.017	21.5750	0.08	16.4720	0.68	13.4400	0.001
	74.3333		24.8939		20.7727		16.3030		12.3636	
Satisfied										
Yes	78.7429	0.001	26.4571	0.012	21.8057	0.004	17.0190	0.001	13.4000	0.017
No	73.9767		25.0349		20.0047		15.6744		12.6628	
Addressed in same manner										
Yes										
No	79.7083	0.001	26.8750	0.01	22.1806	0.000	16.8472	0.049	13.8056	0.000
May be	72.3750		24.5000		19.9702		15.5000		12.3056	
Never	76.1940		25.5672		21.1642		16.5672		12.8955	
	78.0000		26.7500		23.5000		17.0000		10.7500	

Table 2: HP-CSS and its subscales values stratified for demographic details.

End of

n=191	Total score (mean)	P	Informative Communication (mean)	P	Empathy (mean)	P	Social skills (mean)	P	Respect (mean)	P
Age										
23	91.0000	0.139	30.0000	0.102	26.0000	0.472	18.0000	0.06	17.0000	0.599
24	73.6923		24.5385		21.0000		15.3077		12.8462	
25	76.3889		25.9444		21.3889		16.2778		12.7778	
26	77.3235		25.6471		21.2059		17.2353		13.2353	
27	76.3000		26.1500		21.1250		16.1750		12.8500	
28	77.8444		26.3556		21.7111		16.6000		13.1778	
29	76.3810		25.1429		21.4762		16.4762		13.2857	
30	71.1667		23.6667		20.0000		15.0000		12.5000	
31	77.0000		26.8000		20.6000		16.6000		13.0000	
32	102.0000		36.0000		27.0000		23.0000		16.0000	
36	77.0000		29.0000		20.0000		13.0000		15.0000	
Gender										
Male	76.5581	0.961	25.7791	0.904	21.2558	0.862	16.4070	0.862	13.1163	0.778
Female	76.6286		25.8476		21.3333		16.4190		13.0286	
Departments										
Medical & allied	77.8514	0.707	26.2973	0.670	21.7838	0.40	16.9324	0.04	12.8378	0.068
Surgery & allied	76.0597		25.4627		21.1493		16.2090		13.2388	
Gynae & Obs	75.8750		25.3750		21.2500		16.2500		13.0000	
Paeds medicine	75.0400		25.4000		20.6000		16.3600		12.6800	
Others	75.8889		26.4444		20.4444		14.1111		14.8889	
Marital status										
Single	76.3542	0.151	25.5729	0.274	21.1875	0.492	16.4062	0.321	13.1875	0.080
Married	76.8082		25.9863		21.5205		16.3562		12.9452	
Engaged	78.8421		26.8947		21.4211		17.0526		13.4737	
Divorced	65.0000		22.6667		18.6667		14.0000		9.6667	
Parents doctor										
Yes	76.0303	0.716	25.5455	0.663	21.5152	0.654	16.2121	0.638	12.7576	0.360
No	76.7152		25.8734		21.2532		16.4557		13.1329	
Smoking										
Yes	73.6923	0.038	24.7179	0.040	20.6154	0.117	15.6923	0.061	12.6667	0.189
No	77.3421		26.0987		21.4737		16.5987		13.1711	
Residence										
Boarder	75.0417	0.088	25.2500	0.120	20.9028	0.163	15.9167	0.047	12.9722	0.631
Non boarders	77.5378		26.1597		21.5378		16.7143		13.1261	
Year of residency										
1	75.6415	0.336	25.3585	0.314	21.1321	0.377	16.3396	0.880	12.8113	0.281
2	75.6522		25.3623		21.0580		16.3333		12.8986	
3	79.2889		26.7556		22.0667		16.7778		13.6889	
4	76.4348		26.3478		21.0000		16.1304		12.9565	

Discussion

Communication skills are important for all professionals particularly physicians. Medical professionalism and communication skills are one of the most important components of being a physician. Patients commonly complain that physicians do not listen to them [2, 3]. Effective communication between doctor and patient is beneficial both for the doctor and the patient. Among physicians, residents are those who are first to attend the patients in different teaching hospitals and first to communicate with the patients. Communication skills have been defined by many authors. According to the Concise Oxford Dictionary the word means 'the act of imparting, especially news', or 'the science and practice of transmitting information'. These definitions clearly show the link between 'teaching' and 'communication': teachers are constantly imparting new knowledge, or transmitting information [8-10].

As communication skills are of such an importance, factors that affect these skills should be identified. Also, methods to improve the skills should be recommended. Improving education regarding communication skills is a key tool to improve communication skills leading to a better doctor-patient relationship [2, 11]. In our study we had identified that communication skills improve significantly with attending communication skills workshops.

Although written material is useful in improving patient-physician communication, behavioral change is more likely to occur in a workshop. In a meta-analysis, authors concluded that the communication skills training courses significantly help the healthcare providers in improving their communication and they tend to provide facts to the patients in a better way [12]. A cross-sectional study conducted in Tabriz University of Medical Sciences strongly proposed to improve the communication skills of physicians by conducting training courses [13]. Different postgraduate programmes have identified the importance of communication skills and a mandatory communication skills workshop is recommended in the program. Apart from this regular optional workshop for the PGRs, such sessions should also be conducted by various departments individually [1, 2, 10].

Our study had many limitations as well. Firstly, we included PGRs only from one institution in our study, therefore, our results may not be generalized. Secondly, the sample size was limited.

Conclusion

High communication skills were related to attending the communication skills workshop. A national level survey should be performed to identify and address the risk factors. Regular communication skills workshops for residents should be recommended for better outcome.

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.

Original Article

COVID Positive PCRS in Admitted Burn Patients at Burn and Reconstructive Surgery Center, Holy Family Hospital

Nur ul ain[1], Hashaam khurshid[2], Hasnain Khan[3]

[1,2] post graduate trainee, department of plastric surgery, Holy family Hopsital, Rawalpindi
[3]Associate Professor, Head of department, Department of Plastic Surgery, Holy Family Hospital, Rawalpindi

Author's Contribution

[1] *Conception of study*
[1,2] *Experimentation/Study conduction*
[1] *Analysis/Interpretation/Discussion*
[1,2] *Manuscript Writing*
[3] *Critical Review*
[3] *Facilitation and Material analysis*

Corresponding Author

Dr. Nur ul ain, Post graduate trainee, Department of plastic surgery, Holy Family Hospital, Rawalpindi
dr.nursyed@gmail.com
03366573639

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ABSTRACT

Objective: To evaluate the effect of COVID-19 on the working of a burn and reconstructive surgery center in a tertiary care hospital.

Study Design: Audit study.

Place and Duration of Study: Holy Family Hospital, Rawalpindi from 1st March 2020 to 31st May 2021.

Methodology: During the study period i.e. from 1st March 2020 to 31st May 2021 we calculated variables such as number of number of hospital admissions, emergency patients, OPD patients, laboratory investigations conducted and mortalities. All variables were computed by taking monthly average and then compared.

Results: There were total 1025 admission from 1st March 2020 to 31st May 2021 among which 69.75% were male and 30.24% were female. 735 of the admitted patients (71.70) were tested for COVID which consisted of 77.14% male and 22.85% female patients. Among the patients tested for COVID, 30(4%) turned out positive. COVID positive patients constituted 2.9% of the total admitted patients. Among the COVID positive patients 63.33% were male and 36.67% were female. Out of all COVID positive patients, those presented during 1st, 2nd and 3rd wave were 20%, 46.66% and 33.33% respectively.

Conclusion: Burn patients are predisposed to COVID-19 infection.

Key Words: COVID-19, Burn center, covid-19 testing, covid 19 screening

Introduction

:This year's COVID-19 epidemic started in the Chinese region of Wuhan, and has since spread around the world, infecting humans along the way. the illness caused by the SARS-Cov-2 virus was officially named coronavirus disease 2019 by the WHO on January 12th, 2020 (COVID-19). Infectivity, transmission speed, and severity are all high with COVID-19. Patient treatment and control of the virus's propagation have both been complicated by COVID 19. While many aspects of daily life came to a halt, healthcare professionals remained focused on fighting the epidemic and finding new methods to keep the illness at bay. Methods such as social distance and the use of personal protective equipment (PPE) were important tactics in preventing disease transmission. 4

Globally, the COVID-19 epidemic has impacted burns services.

During the current COVID-19 epidemic, burn care facilities must implement SARS-CoV-2 screening and prevention strategies for both inpatient and outpatient settings. This is because burn victims are more susceptible to infection and disease spread amongst one another. However, a burn is a life-threatening emergency that must be treated immediately. As a result, burn treatment begins even before COVID-19 testing is completed. Protection measures such as the use of coverall PPE suits and well-fitted N 95 masks are used to reduce the risk of infection. There are metabolic abnormalities, vascular hyperpermeability, and hemodynamic instability linked with severe burns (6 major burns). 7 Acute lung damage, coagulopathy, and cardiovascular abnormalities are among side effects of SARS-CoV-2 infection. The danger of infection and sepsis for burn victims is very high. When nine burn victims acquire the virus, it complicates their therapeutic treatment and may even worsen their clinical prognosis. 10

From March 1, 2020, through May 31, 2021, we audited all patients admitted to Rawalian Burn and Reconstructive Surgery Center, including those with and without burns. Patients who were hospitalised and tested for COVID-19 as well as those who tested positive for COVID-19 were the subjects of our research. COVID-19 was studied in order to see how often it is among burn victims and what effect that has on how they are treated.

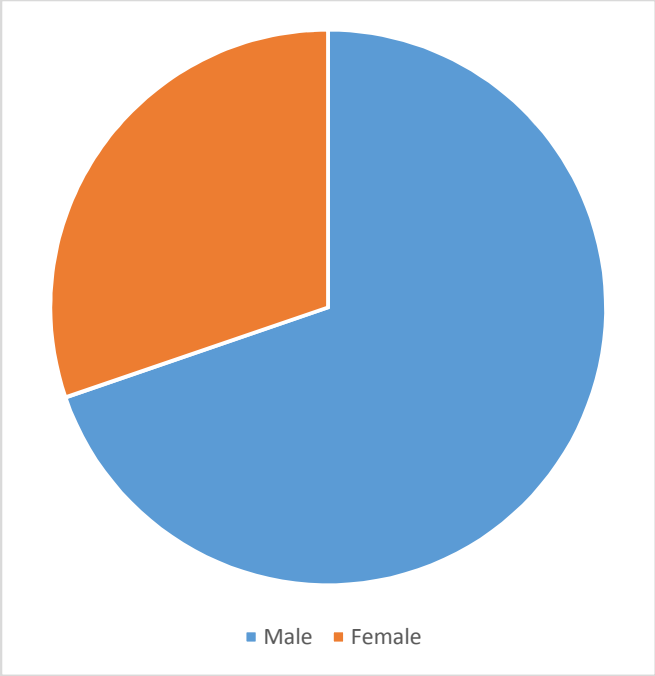
Objective: To see how COVID-19 affects a tertiary care hospital's burn and reconstructive surgery center's efficiency.
Study Design: Audit Study.

Place and Duration of Study: Holy Family Hospital, Rawalpindi from 1st March 2020 to 31st May 2021.

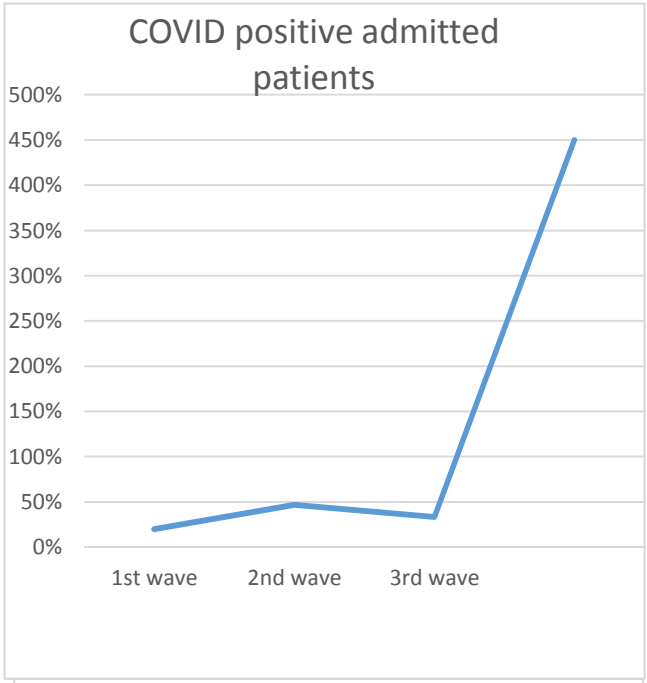
Materials and Methods

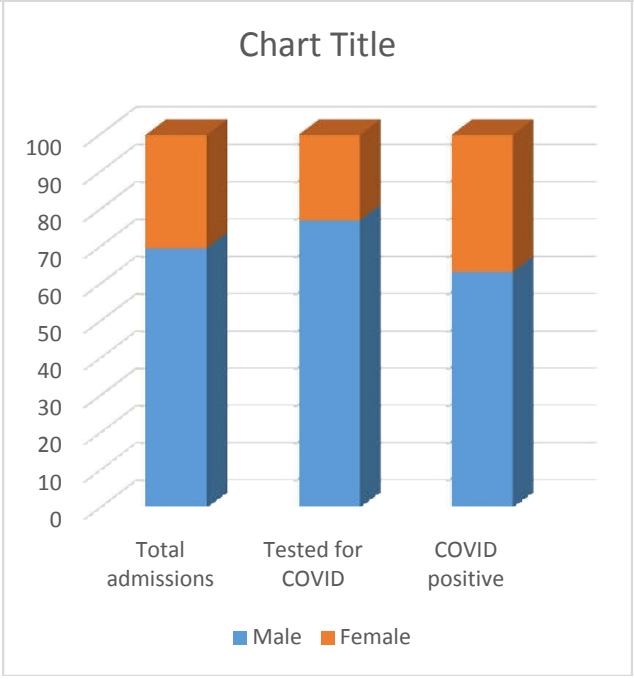
It is an audit study. During the study period i.e. from 1st March 2020 to 31st May 2021 A retrospective analysis of the record was conducted and we calculated variables such as gender, number of hospital admissions, emergency patients, OPD patients, laboratory investigations conducted i.e. COVID-19 PCR and mortalities. First wave from 1st March 2020 to 30th October 2020, second wave from 1st November to 28th February 2020 and third wave from 1st March 2021 till 31st May 2021. All variables were computed by taking average in three waves of COVID 19 cases and then compared.

Results



There were total 1025 admission from 1st March 2020 to 31st May 2021 among which 69.75% were male and 30.24% were female. 735 of the admitted patients (71.70) were tested for COVID which consisted of 77.14% male and 22.85% female patients. Among the patients tested for COVID, 30(4%) turned out positive. COVID positive patients constituted 2.9% of the total admitted patients. Among the COVID positive patients 63.33% were male and 36.67% were female. Out of all COVID positive patients, those presented during 1st, 2nd and 3rd wave were 20%, 46.66% and 33.33% respectively.





Discussion

The COVID-19 epidemic wreaked havoc on the globe, affecting patient care in hospitals all over the place. 11,12 Protocols for burn centres throughout the world vary based on the local concentration of COVID-19. While some hospitals only accept COVID-19 negative burn victims, others care for both types of patients. Regardless of COVID-19 status, all patients coming to our burn centre were accepted and appropriate preparations were made in the event a patient tested positive.

With numerous aerosol-generating operations, prolonged close contact with the patient during wound care and surgery, burn centres have increased infectivity rates.

As a result of the link between increased need for intensive care and a higher death rate in COVID-19 burn victims, an admission procedure had to be established.

Healthcare personnel and patients must be screened for infection, suspect and positive cases must be isolated, and the threshold for COVID-19 testing must be low to reduce the spread of infection.

15,16,17 The WHO recommends using RT-PCR from oropharyngeal or nasopharyngeal swabs for COVID-19 suspected patients. Additionally, a chest CT scan is an option. 18,19 As a result of a scarcity of resources, we only performed imaging on patients who had respiratory symptoms and a negative RT-PCR.

The RT-PCR test for COVD-19 was positive in 2.9% of the individuals who participated in our research. Nearly half of those infected with COVID-19 are asymptomatic carriers, according to research. 20 It's understandable that in the early stages of the research, prior to the change in testing criteria, we missed some asymptomatic patients. Because they had no symptoms, the individuals who tested positive had never been suspected. Many people who had been suspected of having COVD-19 were found to be negative. Respiratory distress and fever are often seen in patients with burn sepsis and inhalational burns, thus it may be difficult to tell them apart from COVID-19-related symptoms. Until no new cases were detected, patients and health care personnel in certain burn hospitals underwent repeated weekly testing to help identify asymptomatic individuals and break the transmission cycle. 16

Our testing procedures faced several difficulties, such as the fact that the companions accompanying the patient would change on a regular basis and resources would not allow us to screen them all. Furthermore, the study's positive cases were much too few to draw any conclusions about the infection's transmission risk factors.

The bottom line is that burn patients are an especially vulnerable group for the SARS-CoV-2 virus because of the close contact and aerosol exposure that comes with burn treatment. Burn patients have weakened immune systems, which puts them at risk of contracting a severe type of COVID-19 infection. It's important to separate infected patients from healthy ones in burn centres in order to avoid the spread of illness to both patients and healthcare staff once these discoveries were made.

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Original Article

Effect Of COVID Pandemic On Elective Surgeries At Burn And Reconstructive Surgery Center, Holy Family Hospital

Hashaam khurshid[1], Nur ul ain[2], Hasnain Khan[3]

[1,2] Post graduate trainee, Department of Pediatric Surgery,Holy Family Hospital, Rawalpindi

[3] Head of Department, Department of Plastic Surgery, Holy Family Hospital, Rawalpind

Author's Contribution

[1] *Conception of study*
[1,2] *Experimentation/Study conduction*
[1] *Analysis/Interpretation/Discussion*
[1,2] *Manuscript Writing*
[3] *Critical Review*
[3] *Facilitation and Material analysis*

Corresponding Author

Dr. Nur ul ain, Post graduate trainee, Department of plastic surgery, Holy Family Hospital, Rawalpindi
dr.nursyed@gmail.com
03366573639

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Abstract

Objective: To see how COVID-19 affects the number of elective operations performed at a tertiary care facility.
Study Design: Audit Study.
Place anr Duration of Study: burn and reconstructive surgery center, Holy Family Hospital, Rawalpindi from 1st March 2020 to 31st May 2021.
Methodology: It was decided to examine the medical records of patients who were hospitalised and operated on during the COVID-19 pandemic (March 1, 2020 to May 31, 2021). We examined clinical data from 1 March 2017 to 31 May 2018—the period immediately before the COVID-19 pandemic. Patients with burns and plastic surgery, as well as total operations performed and procedures postponed until complete elective lists reopened, were all included in the criteria we examined.
Results: There was a significant drop in almost every metric when comparing the patients from the two time periods. The average admission was down by 51%, with the biggest drop being among cosmetic surgery patients. Elective operations had the biggest drop, by a whopping 66%. Another 564 people will have to wait until the elective lists reopen before they may be treated
.**Conclusion:** The Holy Family Hospital's Burn and Plastic Surgery Department saw a drop in the number of patients admitted and operated on.
Key Words: *COVID-19, Hospital working, Patient load, Elective surgery.*

Introduction

In December of this year, Wuhan, China, saw a case of pneumonia with an unknown cause. Gradually, it reached every corner of the globe, not only China. The illness was found to be caused by a new coronavirus after an examination of the material. The respiratory system is the most severely impacted organ. The International Committee on Taxonomy of Viruses named it SARS-COV2 (severe acute respiratory coronavirus-2). It was classified as coronavirus illness by the World Health Organization (COVID-19). 1 The WHO labelled it a pandemic on March 12th, 2020. 2

The first verified case was discovered in Pakistan's Karachi on February 26th, 2020. Punjab got its first case within a week as well. 3

Even the finest healthcare systems have been affected by the disease's stress and strain. Rationing care recommendations were released by the Italian College of Anesthesia, Analgesia, Resuscitation, and Intensive Care on March 11. 4 According to CMS, all elective operations, non-essential medical, surgical, and dental treatments will be postponed in the United States. Elective operations were also put on hold in Australia. Elective operations were delayed, non-COVID emergencies were reduced, and the use of telemedicine and a general decrease in the number of patients were all implemented in the UK's NHS.

The SKMH in Pakistan has to temporarily stop accepting new cancer patients because of overcrowding.

To the best of the authors' knowledge, the effect of COVID-19 on the operation of Pakistani hospitals has yet to be measured. An audit of elective operations performed before and after COVID-19 was the goal of this research, in order to determine the impact of COVID-19 on those procedures.

Materials and Methods

In our setting, we performed a retrospective analysis of the record using the records that were readily accessible to us. The number of patients admitted and the number of operations performed were compared.

We narrowed it down to two time frames. The time frame for the research was set at one year after the discovery of the first confirmed case of COVID-19 in Pakistan, or from the first of March to the last day of May of the following year. COVID epidemic began on March 1, 2017, and ended on May 29, 2018, thus the control period was defined as 15 months before that date. Total admissions, total operations, and total surgeries delayed until complete elective lists reopened were all compared between the research period and the control period.

Results

There was a drop in almost every metric. As a result, the average number of patients admitted to the hospital went down by 51%, while OPD visits dropped by 60%. The number of people presenting themselves to the Emergency Department has dropped by 25%. The elective surgery rate dropped by 66%, and it was followed immediately by a 64% drop in average monthly mortality. Minor surgeries and births both decreased by 33% and 35% on a monthly basis, on average. The following are some of the findings.

Table 1

Comparison of parameters between study period and control period

Parameters	Pre-COVID	COVID
Total admissions	837	1087
Total Surgeries	977	-
Total Deferred Surgeries	-	564

Table 2

Statistics of Open wounds cases delayed

Total number of Open wounds delayed	47
Male	29
Female	18
Total	47

Table 3

Statistics of Academic cases delayed

Total number of Academic cases delayed	145
Male	87
Female	58

Table 4

Statistics of operations and type of surgery

Type of surgery	Number of operations
Hand	53
Head and neck	22
Cleft Lip/ palate	44
Brachial plexus	5
Free flaps	7
Others	20

Table 5

Statistics of routine elective dated cases delayed

Total number of routine elective dated cases delayed	372
Male	176

Female	107
Child	89
Local	127
General Anesthesia	245

Table 6
Statistics of operations per COVID wave

COVID wave	Number of operations
1st wave (26th Feb 20 - 2nd Oct 20)	170
2nd wave (3rd Oct 20 – 21st Feb 21)	128
3rd wave (22nd Feb 2021 – present)	74

Table 7
Statistics of number of OT lists per week before and during COVID

Total OT lists, per week before COVID	8
Total OT lists, per week during COVID	5

Discussion

Several steps have been implemented across the globe to cope with the COVID-19. There has also been a move toward social distance as well as selective as well as broad social confinement. Our country's reaction ranges from total containment to selective confinement. In addition, the healthcare system has been reorganised to handle the influx of patients anticipated in the near future. Steps have been made to guarantee that regular patient care is provided in the same seamless manner as previously. A few shifts in hospital working patterns have been seen over this time period, but none are major. These alterations seem to have been noticed by researchers across the world. 9-12

According to our analysis, hospital admissions dropped by half during the pandemic's last months compared to the same period the previous year. When admissions linked to COVID-19 were excluded, the impact was much greater (Table I).

Similarly, before the pandemic, the monthly number of OPD patients seen at the hospital dropped by nearly half. In late March, the authorities enforced a full lockdown on the city. During that time, the OPD was closed. 13 Despite the fact that OPD services were fully resumed at the beginning of April, patient presentation remained low, and the difference could not be entirely ascribed to the closure. There was also a decrease in the number of people who visited the Emergency Department. In comparison to the other departments, this one had a 25% decrease in staff. It's possible that the decline in elective instances was the most dramatic. The number of major operations dropped by nearly 67%. The number of minor operations has fallen by 34%. Since elective operations have been replaced by pooling and using existing resources for the treatment of COVID-19, a decline in elective cases was anticipated.

There was an anticipated decrease in all disciplines, given the hospital's investigative output. During the research period, the number of radiological and laboratory tests was cut in half (Table I).

To no one's surprise, there was an approximately 30% drop in the number of cases when that division of the hospital was reevaluated. The number of elective C-sections was decreased, but so did the

number of natural deliveries. It's safe to assume that patients are avoiding hospitals during the epidemic.

The death rate was one of the most shocking findings. With 358 deaths per month before to the epidemic and 126 deaths per month during the pandemic, mortality decreased by 65% even after adding COVID positive individuals. When compared to the other metrics, this was a surprise since they didn't indicate such a significant drop.

In other areas of the globe, there has been a decrease in patient numbers,10,12 although it is unclear what is causing this decrease in emergency room visits. Because of the lockdown, it's reasonable to assume that individuals stopped moving about as much on a regular basis, which may have contributed to a decrease in traffic fatalities. It's possible that cutting down on eating out contributed to a reduction in the frequency of diseases like typhoid, appendicitis, and symptoms of the gallbladder The decrease in instances may have been attributed to less everyday stress.14

A new research confirms that the COVID-19 epidemic has resulted in fewer patients being admitted to our country's hospitals. Despite the fact that services have resumed, patients still seem to be avoiding hospitals. Patient numbers may rise again, putting healthcare systems at danger of being overburdened with problems as a result of patients' delayed treatment.15

Conclusion

COVID-19 has resulted in fewer patients being seen at the hospital because of it. It's difficult to pinpoint exactly what's causing it.

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Original Article

Is Education A Factor Influencing Benign Cyclic Mastalgia

Maham Tariq[1], Yumna Khan[2], Jamal Nasir Malik[3], Zaitoon Zafar[4], Aamnah Tariq[5]

[1] *Fellow Breast Surgery, CMH Rawalpindi*
[2,3] *Postgraduate Trainees, General Surgery, Holy Family Hospital*
[4,5] *MBBS*

Author's Contribution

[1] *Conception of study*
[2,4] *Experimentation/Study conduction*
[3] *Analysis/Interpretation/Discussion*
[1,3] *Manuscript Writing*
[2] *Critical Review*
[3,5] *Facilitation and Material analysis*

Corresponding Author

Dr. Jamal Nasir Khan,
Postgraduate Trainees, General Surgery, Holy Family Hospital
03116886111
jamalkhan0404@gmail.com

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Abstract

Background: Cyclic mastalgia is one of the commonest complaints in women that ends up with referral to breast surgery clinics. Studies relating cyclic mastalgia to the education levelof women are sparse. The current study focuses on recognizing whether level of education has an impact on cyclic mastalgia.

Methods: This cross-sectional study included 129 female patients presenting with benign cyclic mastalgia. The levels of education were categorized into three groups: high school or some college (primary level), bachelor's degree (secondary level), and master's degree or higher (tertiary level). We obtained meaningful evaluative data using a questionnaire that included questions about their habits, intensity and duration of cyclic mastalgia, and responseto its treatment.One-way analysis of variance (ANOVA) was used to investigate the differences according to the level of education.**Results**: The percentage of women with master's degrees was low (primary = 65%; secondary = 28%; tertiary = 7%). Results of the ANOVA confirmed there were statisticaldifferences between the three levels of education in regard to their pain score, duration ofpain and response to treatment. Pain score and duration appeared to favor those with tertiary-level qualifications compared to secondary and primary levels (ANOVA: severity mean rating 2.44 vs. 4.53 vs. 6.11, respectively; p = 0.000; duration mean rating 4.44 monthsvs. 6.78 months vs. 9.07 months, respectively; p = 0.000). Paradoxically or not, the highest response to treatment was received from primary level, compared to the response rates from secondary and tertiary levels (ANOVA: p = 0.000).

Conclusion: The most educated women had the least prevalence of cyclic mastalgia. Their better health can also attributed to the level of education, highlighting the scale of the needfor quality education. However, an indirect consequence of the emphasis on health that comeswith education is that, it can potentially act as a barrier to treatment compliance. Our findingscall for psychological reassurance and behavioral changes as complementing traditional university education to ensure response to treatment.

Introduction

Breast pain, referred to as mastalgia, is the most common presenting symptom in women with up to 70% facing it at least once in their lifetime, presenting in a general surgery outpatient clinic or a breast clinic [1]. Cyclic mastalgia is the most common variant, with roughly two-thirds of breast pain being cyclic and one-third noncyclic [2,3].

Cyclic mastalgia is felt diffusely and bilaterally, and may extend to the upper and outer quadrants of the breast, the axillae and arms [4]. It is classically linked to the monthly menstrual cycle being most severe before a menstrual period and subsiding when it ends, explained by the stimulating effects of estrogen and prolactin on the ducts during the luteal phase, causing the breasts to retain water [5]. It may worsen during perimenopause and even linger into menopause especially in women on oral contraceptives or hormone replacement therapy [6]. Cyclic mastalgia is distinct from premenstrual syndrome that includes a range of symptoms encompassing but not limited to cyclic mastalgia [7], and it should be taken as such. Unfortunately, studies specific to breast pain are limited and small in size.

Since cyclic mastalgia is that common, it becomes imperative to explore factors that drive its presentation and response to treatment. One such factor being the level of education of women presenting with mastalgia. Although the association between education and mastalgia has been discussed before, albeit slightly and with other psychosocial and nutritional factors [8-10], our literature search did not reveal any study in which the focus or stratification was based on education level alone. To date, there is little evidence as to whether education has a significantly large effect on cyclic mastalgia. In the current study, our aim was to quantitatively investigate the effects of education on cyclic mastalgia. The following questions were posed: does level of education affect presentation, and is there a difference between the levels in their response to treatment.

Materials and Methods

This single-centre, cross-sectional study included women with benign cyclical mastalgia presenting to the breast surgery outpatient clinic of surgical unit 1, Holy Family Hospital, Pakistan, for 12 months, from February, 2019 to March, 2020. Ethics approval was obtained from the Institutional Review Board (IRB) of Rawalpindi Medical University. Pregnant or breastfeeding women, and those with a history of breast cancer, breast trauma, or cystic or solid lesions > 1 cm on ultrasound or mammography were excluded from the study. Those with breast pain arising from pectoralis muscle strain, costochondritis, arthritis, and women on postoperative observation after thoracic procedures were also excluded. Cyclic mastalgia was diagnosed in those women who reported anything ranging from a dull ache to a feeling of fullness or soreness in their breasts, in the days or weeks leading up to the start of their menstrual period and easing up afterward, for at least three months in a row, or in response to combined hormonal contraception like birth control pills or hormone replacement therapy for menopause.

Among 15-50 years old, a postgraduate resident collected data using a well-informed questionnaire after obtaining the patient's informed consent, under supervision of senior

associates. The age, gender, employment status, level of education, menopausal state, and

number of births were taken into account using the questionnaire. We scored education as three categories: from high school or some college (primary level), to bachelor's degree (secondary level), and master's degree or higher (tertiary level). For all further questions asked, patients were stratified based on their level of education. Questions related to the duration of pain, the laterality of pain, its relationship to the menstrual cycle, and pain intensity using the visual analog scale (VAS) were asked. In the second part of the questionnaire, we questioned women on practices that are known to relieve or aggravate cyclical mastalgia, even with debatable causality. In the final section of the questionnaire, they were questioned regarding their attitude toward mastalgia, their reservations about the treatment prescribed, and how likely they were to follow the treatment prescribed. The treatment options prescribed to the patients were: evening primrose oil, exercise, hot or cold compresses, wearing a firm support bra, sports bra during exercise, a low-fat diet, cutting down on tea or caffeine intake, nonsteroidal anti-inflammatory drugs, danazol and tamoxifen (in severe cases only). Response was rated on a two-point scale of zero to one.

At the end, the IBM Statistical Package for Social Sciences (SPSS), Version 23.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. The results are presented as percentages and descriptive statistics. Post-stratification one-way analysis of variance (ANOVA) test was applied, followed by Tukey's honestly significant difference (HSD) post-hoc test to likely identify which of the pairs are significantly different from each other; any p-value less than 0.05 was considered significant.

Results

150 women with chief presenting complaints of mastalgia presented to the clinic during the study period. 21 patients whose mastalgia was secondary to pregnancy, lactation, known or suspected breast cancer, breast trauma or with lesions on ultrasound or mammography were excluded from the study. The remaining 129 female patients fulfilled the inclusion criteria and were included in the analysis. Their mean age was 28.60 +/- 7.25 years. Table 1 shows that the majority of females were multiparous (44%, n=57), premenopausal (97%, n=125), and were employed either full or part time (67%, n=87). Out of 129 patients with confirmed benign cyclic mastalgia, 84 (65%) were enrolled in high school, 36 (28%) had bachelor's degrees, and 9 (7%) were pursuing a master's degree or higher

Characteristics	N=129
Employment status	57 (67%)
Employed full or part time	87 (67%)
Caring for home or family	40 (31%)
Retired	02 (2%)
Level of education reached	
High school or some college (Primary)	84 (65%)
Bachelor's degree (Secondary)	36 (28%)
Master's degree or higher (Tertiary)	09 (7%)
Menopausal status	
Premenopausal	125 (97%)
Postmenopausal	04 (3%)
Number of births	
Nulliparous	52 (40%)
Primiparous	20 (16%)
Multiparous	57 (44%)

Table 1: Social, demographic and clinical characteristics of all 129 women presenting with benign cyclic mastalgi

	Evening primrose oil N (%)	Oral contraceptive use N (%)	Exercise N (%)	Tea/coffee intake N (%)	High-fat intake N (%)
Primary (N=84)	49 (58%)	27 (32%)	18 (21%)	38 (45%)	45 (54%)

Secondary (N=36)	24 (67%)	3 (8%)	9 (25%)	15 (42%)	12 (33%)
Tertiary (N=9)	7 (78%)	3 (33%)	5 (56%)	4 (44%)	2 (22%)

Table 2 shows that larger proportions of educated women used evening primrose oil and exercised regularly, tea and coffee intake was roughly equal across all levels, while intake of fats was highest at school level and showed a gradual decline as the level of education went up.

Table 2: Dietary and hygienic practices in women presenting with cyclic mastalgia, stratified according to their education level

As is evident in Table 3, on a scale of 1-10, the mean pain score was 6.11 for primary, 4.53 for secondary and 2.44 for tertiary level education. Educated women had lower mean pain scores, and shorter durations of pain from onset to presentation. Hence, it can be drawn that the well-educated reported better health than the poorly educated. Tukey's HSD post-hoc test.

	Primary	**Secondary**	**Tertiary**	**F-Value**	**p-Value**
Pain score measured with VSA, mean +/- standard deviation	6.11 +/- 1.75	4.53 +/- 0.88	2.44 +/- 1.13	32.01	0.000
Duration of pain (months), mean +/- standard deviation	9.07 +/- 2.26	6.78 +/- 2.49	4.44 +/- 1.59	24.98	0.000

Table 3: Comparing pain variables in women with cyclic mastalgia by level of education using ANOVA

VSA: Visual Analog Scale

	Tukey HSD p-Value	Tukey HSD inference

Comparing pairs	Pain score		Duration of pain	
	Tukey's HSD p-Value	Tukey's HSD inference	Tukey's HSD p-Value	Tukey's HSD inference
Primary vs secondary	0.001	** p < 0.01	0.001	** p < 0.01
Primary vs tertiary	0.001	** p < 0.01	0.001	** p < 0.01
Secondary vs tertiary	0.001	** p < 0.01	0.020	* p < 0.05

Table 4: Pairwise Comparisons in pain parameters using Tukey's HSD post-hoc test

** Highly significant at P < 0.01 & * significant at P < 0.05

To determine whether education affects response to treatment of cyclic mastalgia differently, we rated response (response=1, no response=0). The calculated mean response of women in our samples decreased as the level of education went up: the higher the degree, the lesser the response. This difference in average response to treatment according to level of education was statistically significant ($F(2,126) = 29.35$, $p < 0.01$) (Table 5). A Tukey's HSD post-hoc test revealed statistically-significant pairwise differences between primary and secondary, between primary and tertiary, and between secondary and tertiary levels of education (Table 6).

	Primary	Secondary	Tertiary	One-Way ANOVA F-Value	One-Way ANOVA p-Value
Response to treatment when asked, mean +/- standard deviation	0.96 +/- 0.19	0.67 +/- 0.48	0.22 +/- 0.44	29.35	0.000

Table 5: Comparison using ANOVA

Primary vs secondary	0.001	** p < 0.01
Primary vs tertiary	0.001	** p < 0.01
Secondary vs tertiary	0.001	** p < 0.01

Table 6: Pairwise Comparisons using Tukey's HSD post-hoc test

Probing into the details, we discovered that in 5/7 women with master's degrees who had graded their response as zero, nonadherence was led by fears about the risks associated with treatment of cyclic mastalgia. The remaining 2/7 saw difficulty in modifying lifestyle and diet, recognizing treatment as an assault on lifestyle. Of the 9 women in tertiary level, seven had telephone follow-ups, and two had face-to-face follow-ups at the hospital. At follow-up, response was rated zero if it did not appear to differ from the initial response. Their low response continued unchanged, as the difference in the mean response to treatment was not statistically significant when measured by the paired t-test (p = 0.35) at 15 days' follow-up

Discussion

By every measure, adults with higher levels of education enjoy better health and survival than those with lower levels of education. The better-educated feel healthier, suffer fewer aches and pain, have fewer chronic diseases and less psychological distress [11]. In our study too, we found a positive association between education and health. Those with a master's degree or higher reported less, rated lower pain scores (described their pain as mild) and had less chronic pain (lasting longer than 6 months) compared to women at lower levels of education. According to Shobeiri et al., there are no significant differences as far as educational level is concerned [9]. In our study however, we discovered a coexistence between less acquaintance
of education and the prevalence reporting of mastalgia. This resonates with the findings in a case-control study in which the cyclical mastalgia group had a lower educational status than the control group [10].

This may partly be explained by the practices prevalent at each level. Studies have shown that regular exercise and evening primrose oil seem to be associated with lower prevalence of breast pain and better VAS pain scores [12-14], whereas a fat-rich diet generally has a contributory and deleterious effect [15]. Of the five practices studied, we found that educated women implemented more healthy practices like exercise and the use of evening primrose oil, and less fatty food intake compared to the poorly educated. Tea and coffee intake were the only ones for which educated's rates approached less educated's. As Mirowsky and Ross pointed out in their book 'Education, Social Status, and Health', people who are
well-educated are self-autonomous in their lives, which encourages and enables a healthy lifestyle. In addition, learned effectiveness, a practical end of that education, enables
self-direction toward better health [16]. Another plausible explanation is the psychogenic origin of breast pain [17]. It is also likely that many educated women had less substantial

professional and personal psychosocial stressors.

We also found that the interaction between education and response to treatment for cyclic mastalgia is negative. Our results show that every increment in schooling was associated with a lesser response to treatment in a fairly linear fashion (all respective $p < 0.01$). Higher likelihood of response decreased with education. To date, the answer to this question has not been sought in literature. The popular belief that women with higher degrees would be more likely to respond to treatment was negated. Contrary to this, treatment can be intimidating, as we delineated in this study.

Our study has certain limitations: (1) the self-scoring of response by patient leading to the possibility of either underestimation or overestimation; (2) adjustment for socioeconomic indicators like income, employment, and marital status was not done; (3) follow-up should have been a bit broader to assess the outcomes of response to treatment.

Conclusions

We propose that the prevalence of cyclic mastalgia was less as a direct result of education. However, for the very same reason, educated women eventually responded less to treatment, were less willing to disturb their routine, add regimens or even get the suspect foods out of the way. Lifestyle factors seem to play an important part in the perception of treatment, and may be a deterrent to responding, or continuing response to treatment. Importantly, reducing mistrust in treatment is a priority, whatever the severity of nonresponse. Education should be included as an endpoint for future studies on mastalgia.

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Review Article

GARDEN AND HEALTH IN PAKISTAN

Muhammad Umar[1], Riaz Ahmed[2], Junaid Khan[3], Shehryar Malik[4]

[1,] *Vice Chancellor,Rawalpindi Medical University, Rawalpindi, Pakistan.*

[2] *Dean Orthopaedics, Neurosurgery & Trauma,Head of Orthopaedics,Rawalpindi Medical University, Rawalpindi, Pakistan*

[3]*Senior Registrar,Department of Orthopaedics,Rawalpindi Medical University,Rawalpindi, Pakistan*

[4] *Registrar,Department of Medicine,Rawalpindi Medical University,Rawalpindi, Pakistan*

Author's Contribution

[1,2]*Conception of study*
[2,4,] *Experimentation/Study conduction*
[2,3] *Analysis/Interpretation/Discussion*
[1,3,4] *Manuscript Writing*
[1] *Critical Review*
[1,3] *Facilitation and Material analysis*

Corresponding Author

Dr. Junaid Khan, Senior Registrar,Department of Orthopaedics,Rawalpindi Medical University,Rawalpindi, Pakistan

drjunaidrmc@gmail.com,0300-8359907

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Abstract

There is concern that the health care system may be unable to meet the demands of an ageing and growing population in the future. Pharmaceutical medicines, while revolutionary, are becoming more costly, and their effectiveness isn't always as high as it seems in early, ecstatically reported clinical studies. In addition, drugs are given despite the risks of side effects, which are a major cause of hospitalizations, especially for the elderly, who are underrepresented in clinical trials.

The stark difference in life expectancy across various parts of the nation underscores the reality that health is influenced by a variety of social, economic, and environmental variables.

Along with better informing patients and healthcare providers on the actual effectiveness and dangers of medicines, there are possibilities to treat certain physical and mental problems using complementary or alternative treatments, as well as promote lifestyle changes. Treatments like these have the potential to relieve the financial and administrative burden on the health care system, especially in primary care, but they should only be suggested by health experts if there is solid proof that they are helpful; many are unproven

GREEN CARE

So-called green care, or treatment including exposure to plants and gardening, is one category of holistic therapies that aims to heal the entire person and has undergone extensive study via surveys and randomised trials. Several studies have shown that just looking at nature or seeing pictures of it may improve one's mood and mental health.[1] Observing plants was shown to change EEG records in a research conducted in Japan and to decrease feelings of anxiety and panic, lower blood pressure, and reduce muscular tension.[2] Another research conducted in Japan showed that looking at a green hedge rather than a concrete barrier had physiological benefits.[3] The environmental psychologist Roger Ulrich conducted a ground-breaking randomised trial that found that post-operative ward views of plants and trees enhanced patients' moods, reduced painkiller usage, and decreased surgical complications and duration of stay. Patients receiving dental treatment had similar benefits, and seeing natural landscapes and listening to natural noises enhanced their bronchoscopy experience. Patients in a cancer ward who were exposed to sculpture gardens devoid of vegetation in a randomised controlled trial experienced side effects. Pain and anxiety may be reduced after surgery by showing patients photos of countryside on the walls of their rooms, whereas abstract images raised discomfort.[4] A study on the psychological impacts of art gallery visits would be fascinating! In a Swedish mental institution, paintings depicting abstract motifs were often vandalised, but rarely landscapes. Mental health organisation MIND found that taking brief walks in a garden was better for your mental health than taking short walks through a retail complex. The results indicated that the latter was worse.[5]

Another randomised trial found that exposing post-operative patients to eight different types of indoor plants decreased both pain and duration of stay, while also improving patient satisfaction with their hospital rooms (and their overall experience in the hospital). Players' choices may be influenced by seeing images of flowers while playing the dictator game, an economic simulation that asks whether people are motivated purely by self interest. Placing plants in a computer area increased productivity while lowering blood pressure, according to another research Patients with mental health issues have found success using indoor gardening as a treatment. However, plants' benefits do not stop at their aesthetic look; their leaves filter the air of pollutants, dust, and germs, and they also release what scientists term "negative ions" from their leaves. Despite extensive advertising touting the advantages of charged ions, the data to support this claim is weak.[6]

Many studies in the UK and other countries agree that higher proportions of green space, especially biodiverse habitats, are associated with less depression, anxiety and stress, even after controlling for possible confounding factors such as deprivation. Green space is associated with longer life expectancy in Japan. Experiencing green space seems to decrease health disparities caused by poverty, but correlations cannot be used to prove a theory. This kind of research is hampered by difficult-to-disentangle residual confounding relationships between green space, greater income, better housing, and better health (like smoking less). Even while green space has been shown to increase physical activity, it's possible that it also boosts social connection.[7]

GARDENS

Florence Nightingale advocated for therapeutic gardens in hospitals because they benefit patients, visitors, and hospital personnel alike. People who utilise these places report greater pleasure, which Ulrich attributes to their positive effects on stress, particularly if the areas promote biodiversity.[8]

Several hospitals and care facilities now include gardens connected to them. These gardens offer a view from the rooms as well as a place to visit. One-quarter of individuals with disabilities said

gardening was one of their favourite pastimes, according to a Mintel study conducted for the charity Thrive, which promotes therapeutic and social gardening opportunities. Almost two-thirds of those polled said they had a garden, and 87% said they had access to one. In general demographic surveys, a significant majority of people believe that gardens are good for their health. Gardens like those in the National Garden Scheme and those managed by the National Trust are seeing an increase in visits. A reduced incidence of dementia and better health outcomes have been linked to gardening in many nations, and the practise has demonstrated economic advantages for mental health services, for example.[9]

Green Care Farms have become very popular in northern Europe, with hundreds of them currently existing in both Norway and the Netherlands. Those with mental health issues, intellectual impairments, or substance abuse problems, in addition to the elderly, may be assigned to work on working farms, where they will likely be exposed to animals.[10]

THE EFFECTS OF GARDENING ON BODY AND MIND

What is it about gardening that is so good for you? Exercise, social contact, and time in the sun are all part of this programme. In the summer, sunlight reduces blood pressure and boosts vitamin D levels, and the fresh fruit and vegetables that result have a beneficial effect on the body's nutritional status. In addition to restoring dexterity and muscle, gardening provides cardiovascular activity that may burn as many calories as going to the gym. Digging, raking, and mowing all burn a lot of calories, so it's no surprise that many homes have a gym attached to them. People with learning impairments and poor mental health benefit from the social contact offered by therapeutic and community gardens, which may help combat social isolation. Furthermore, the social advantages of such initiatives have been linked to a delay in the onset of dementia symptoms (an effect that might be partly due to the beneficial effects of exercise). Exercise in a garden, employing constraint treatment on a paretic leg, for example45, is more effective, pleasant, and long-lasting for patients recuperating from myocardial infarction or stroke than therapy in conventional exercise venues. Patients who like gardening may find it useful enough to pursue it as a career. There are also effective programmes that enlist volunteers to assist elderly individuals who are unable to care for their gardens, with both the volunteer and the owner benefiting from social contact, as well as the product and a shared interest, in the process.[11]

Physical inactivity is the fourth largest cause of early mortality, according to Intelligent Health, and it leads to diseases of the body and mind that may be prevented. According to the Department of Health, increasing adult activity by only 10% may delay 6,000 deaths and save the country £500 million per year. Regular, moderate-intensity exercise may help prevent dementia, as well as heart disease, diabetes, and cancers of the breast and colon. An Australian research showed that gardening was more beneficial than walking, education, or keeping a moderate alcohol consumption in preventing dementia. It raises one's self-esteem and affects the brain's electrical activity. Similarly, leisure-time moderate exercise is linked to increased longevity regardless of weight, especially when combined with exposure to natural scenes, although some studies have suggested that exercise declines with reduced cognition; a reverse causation bias. However, there is no conclusive evidence to support this.

Although high intensity exercise is beneficial, it's not required to get these results. This is fortunate since older people are less likely to engage in cycling and gym-based exercise, and these activities may be costly. As a result, engaging in outdoor activities like gardening or strolling through green areas may be beneficial for both preventing and treating disease.

Alternative treatments such as gardening and nature have a demonstrated track record of being cost efficient and widely accessible, however complementary therapies have been found to be less successful. Knitting, on the other hand, may be beneficial![12]

THE GREEN ENVIRONMENT

Global air pollution has been connected to an estimated 8000 premature deaths each year, according to the 2016 RCP study on pollution. This problem is also related to a significant number of early deaths in the Pakistan. The terrible air quality in Karachi has been brought to the attention. High death rates in acute medical wards have been linked to poor air quality. Larger forests, as well as urban woods and plants in buildings, gardens, parks, and roads, may all help to balance this problem. Many poisons and particles are removed from the air by trees, which release them into the soil where microorganisms metabolise them or trap them in the hairs on the leaves that fall later in the year. The quantity of particles inside is reduced by roadside trees. In spite of their smaller leaf surfaces, evergreen trees are more efficient in the winter than their deciduous counterparts. When it comes to volatile chemicals, trees do release a range of them, but they also help to keep the air around roadways cleaner. A single maple tree, for example, can remove up to 48 pounds (22 kilogrammes) of particulates and 100 pounds (45 kilogrammes) of carbon each year, as well as harmful metals, nitrogen oxides, and sulphur dioxide. There may be a connection between living near highways and developing dementia and other health issues as a result of exposure to pollutants produced by moving cars, such as nitrogen oxides, carbon dioxide, ozone, metals, organic compounds, and variously sized particles.[13]

Hedges and other plants absorb carbon dioxide and release oxygen, helping to slow climate change. Forests alone could offset a fifth of the world's emissions of carbon dioxide due to human activity. As a bonus, they help the environment by lowering air pollution and noise, as well as cutting down on wind, water runoff, and erosion. By reducing the demand for air conditioning in buildings, shade and the evaporation of water from leaves may decrease pollution production and air conditioning use. In addition to offering a recreational area for exercise, lawns and grass can collect pollutants and pass them on to soil microorganisms. Soil pollution in industrial regions may be helped by plants. Historic tree preservation and addition are difficult since architects do not want to disturb existing trees. As a result, trees must be preserved or included in planning permission requirements, and then carefully maintained.[14]

WHAT CAN HEALTH PROFESSIONALS DO?

Exercise in the garden, green areas, parks, and the countryside should not be seen as dangerous by health care providers or their patients. But instead, they should focus on what's good for the patient's physical and mental health can do. Patients may be directed to therapeutic gardening initiatives in their communities where occupational therapists with horticulture training may assist them in managing and treating their medical conditions. Preventing disease or lessening the consequences of an existing impairment has been known as "social prescribing" or "community referral," and these practises have the potential to enhance people's physical and emotional health. Gardens can also assist to level the playing field for those with impairments, both mental and physical.

The advantages of gardening for veterans in particular have been well examined. The consequences of physical injuries, such as post-traumatic stress disorder (PTSD), may be addressed, and training for a new job in the growing horticulture sector is one option. Hospital and hospice staff should promote the creation of gardens in their facilities. Schools and jails should do the same. In order to influence the design of new health service buildings, they should try to insist that all patient and staff rooms have views of outside nature, and they should place indoor plants in atria and communal areas, as well as in surgeries and clinics, even if they are mistakenly banned from wards. Window boxes and balconies, too, may be put to productive use. In addition, health care providers should urge schools to teach gardening skills and the advantages that come with it.[15,16]

Aside from that, health care providers can urge local governments to plant more trees, since the Pakistani government alone intends to plant two million

additional trees by 2025. There will have a positive impact on the environment if we have more green places like parks, gardens, and allotments. Gardens and green space abound despite our cities' seeming congestion; on average, one fifth of the land in cities is reserved for green space. Roof gardens, green walls, and hanging pots are becoming more popular, even in densely populated areas like New York and Singapore. A clean and well-maintained neighbourhood boosts community pride while reducing crime and social isolation. Green space must be emphasised in the minds of city planners, as it is in Holland.

Gardens and gardening should be integrated into hospitals and institutions to improve public health, as proposed by Pakistani Prime Minister. I believe medical experts would lead the charge in this effort.

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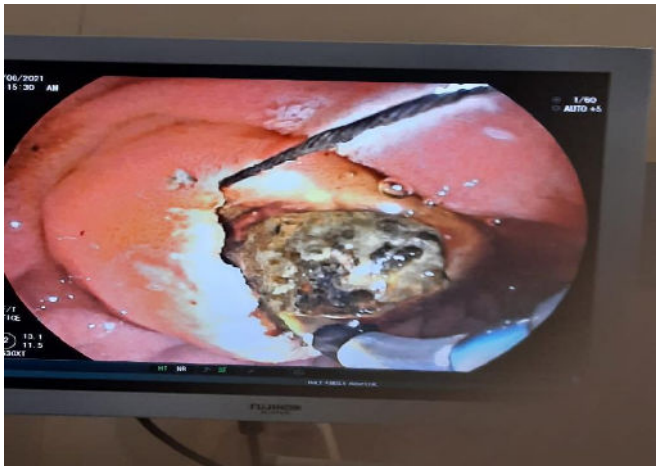
Image Of Issue

Common Bile Duct Stone Retrieval with Sphincter-Tome as Retrieval Basket Effect

Muhammad Umar[1]

[1]*Vice chancellor, Rawalpindi Medical University, Rawalpindi*

This is the image of a 50 years old male patient with Obstructive Jaundice and Common Bile Duct (CBD) Stone. ERCP of the patient was done by Professor Dr. Muhammad Umar S.I., Vice Chancellor RMU and after placing the wire, standard Sphinterectomy was done. Sphincter-tome was pushed up in CBD to assess the size of the Sphincterotomy. During this the stone got stuck in the wire and sheath of sphincter-tome producing the basket effect. Stone was retrieved with the sphi.



Case Report

Case Report of an Unvaccinated Child with Diphtheria Associated With Myocarditis and Polyneuropathy

Shanza Nazish[1], Uzma Aftab[2]

[1] Post Graduate Trainee, Pakistan Atomic Energy Commission Hospital Islamabad

[2] Fourth Year Student, M.B.B.S

Introduction

Diphtheria is an infection caused by members of *Corynebacterium* genus which are club shaped gram positive rods.Most infections of diphtheria are due to toxigenic strains of *Corynebacterium diphtheriae* while *C.ulcerans* and *C.pseudo tuberculosis* rarely cause the disease .Before the development of vaccine diphtheria had been a major cause of childhood morbidity and mortality(1).According to World Health Organisation,extensive immunisations has greatly reduced the number of cases from 100,000 cases in 1950 to 8000 cases in 2009 and then 4530 cases were reported worldwide in 2015(2).The prevention against diphtheria includes vaccination of children and chemoprophylaxis of people in close contact with confirmed cases of diphtheria.The globally accepted vaccine is DTP which is a combination of vaccines against Diphtheria,Tetanus and Pertussis(1).Although it has become a disease of past in many countries but it is still a major concern for many other countries due to low vaccine coverage and progressively decreasing vaccine immunity in adults(3).Diphtheria is primarily of three types i.e Respiratory,Cutaneous and Ocular.However diphtheria toxin can disseminate into blood and affects myocardium and peripheral nerves.This leads to serious complications such as Myocarditis,Peripheral neuropathy and Polyneuropathy(1)It has been estimated that myocarditis and/or peripheral neuropathy is present in 10-20% of people presenting with diphtheria.Myocarditis is associated with 60-70% of death in acute phase of Diphtheria(1).Completely unvaccinated children are more likely to develop myocarditis than partially immunized children(4).Unvaccinated population affected with diphtheria has a high fatality count of 5-17%(1).

Severe diphtheria with myocardial and neurological involvement in a swedish patient is presented in a case report by Sten Skogmar(2).Van Damme also presented the case of a child suffering from fatal diphtheria myocarditis in whom unfavourable outcomes are associated with delayed administration of anti toxin(5).My case report highlights the cardiac and neurological complications of diphtheria that developed in an incompletely vaccinated child.Various symptoms are reported in order of their occurrence.This case further highlights that undertreatment of child initially caused the development of complications.Furthermore the role of superstitious beliefs and illiteracy as a hurdle in eradicating diphtheria is also discussed.

Case Report

A 3 years old male child resident of a village in KPK Pakistan was admitted to Paediatrics department of our city hospital with **complains** of vomiting for 7 days and nasal regurgitation for 3 days.The patient experienced fever on day 1 of his illness,sore throat and mild neck swelling on day 2 ,the neck swelling was marked on day 3.From day 4 to 6 fever and neck swelling settled and he began to experience vomiting by day 7 and then respiratory difficulty with nasal regurgitation and signs of cardiac failure by day 8 of his illness. The child was initially taken to a regional hospital where doctors diagnosed him as a case of diphtheria but he received only 40,000 IU dose of Diphtheria Antitoxin.He was taken to home and on aggravation of symptoms was brought to our hospital. On second day of his **admission** he experienced twisting of left hand and was bed bound and unable to walk by 3rd day. Patient was incompletely vaccinated .Only given OPV and BCG at birth as indicated by his vaccination record(Fig.1). He was living in a house having 4 living rooms with 12 family members.Parents of the patient told the doctors that the cousin of this child as well as many other children in their locality have this disease because they don't get their children vaccinated owing to their superstitious beliefs.He had a history of decreased appetite,insomnia and irritabililty.There was no history of weight loss.Other GIT,musculoskeletal and Genitourinary history was insignificant.Patient had no history of prenatal,natal and post natal complications.

On Examination he was conscious and irritable.Vitals included PULSE 160beats/min,RESPIRATORY RATE 70/min,B.P 105/50mmHg and he was febrile.His height was 94 cm(centile),weight 12 kg and OFC was 50 cm.Throat inspection revealed Greyish White membrane and absent Uvular reflex.On eye examination there was lateral deviation of right eye and absent accommodation reflex.On CVS exam S1+S2 audible with gallop rhythm.Apex beat was at 5th intercoastal space nondisplaced .He had tender Hepatomegaly having total span of liver as 17 cm and it was palpable 6cm below the costal margins with round and regular border along midclavicular line.CNS Examination revealed GCS 15/15,decreased Tone and Reflexes in all limbs,Power 4/5 in lower limbs.Planters were downgoing.Speech was intact with nasal twag.Signs of 3rd,9th and 10th nerve palsy were present. Respiratory signs included bilateral harsh vesicular breathing.

For **Investigations,** throat and blood specimens of patient were sent for culture but they came out negative because he had already been treated with antibiotics in the regional hospital. CBC report showed raised WBCs (15150 per microliter) with marked neutrophilia(75% neutrophils) suggestive of bacterial infection.Hb was 9.5 g/dl. CRP was raised (55mg/dl).Serum electrolytes and RFTs were normal.

ECG changes showed low voltage ECG with T wave changes(Fig2.)Echo report showed signs of dilated cardiomyopathy (Fig3.)Nerve conduction studies and cardiac markers were normal.Stool culture was negative for polio. .Considering the history of contact,incomplete vaccination status and types of complications developed in the patient the final diagnosis of diphtheria with myocarditis and neurological complications was made.

Patient was admitted in icu with strict vital monitoring .Managed with diphtheria antitoxin,60lac IU . Injection Lasix was given for congestive cardiac failure with ECG monitoring done.For myocarditis steroids were given.Ng passed for nutritional buildup and to prevent aspiration. .Neurophysician consultation done .All household contact were given erythromycin

prophylaxis .Patient condition begins to improve gradually since at time of discharge congestive cardiac failure with myocarditis got settled.Nasal regurgitation also settled but lateral deviation of eye remained persistent for which regular eye consultations advised . Patient got vitally stable with no active distress and regular followups were advised to see the complications.

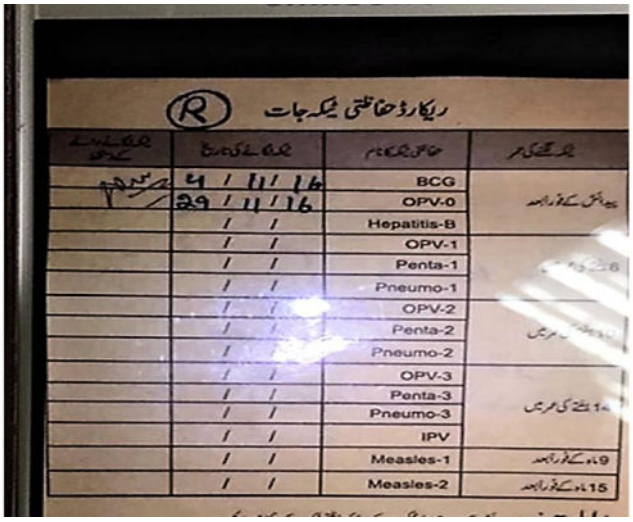


Figure 6 Vaccination card of the patient showing incomplete vaccination status

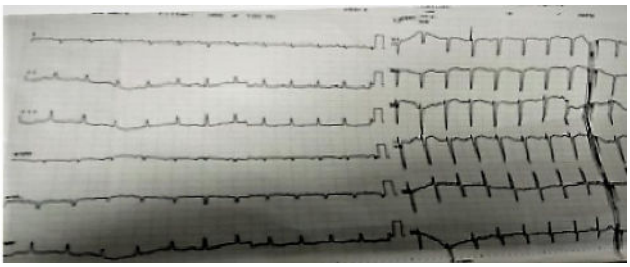


Figure 8 ECG of the patient showing T wave inversion

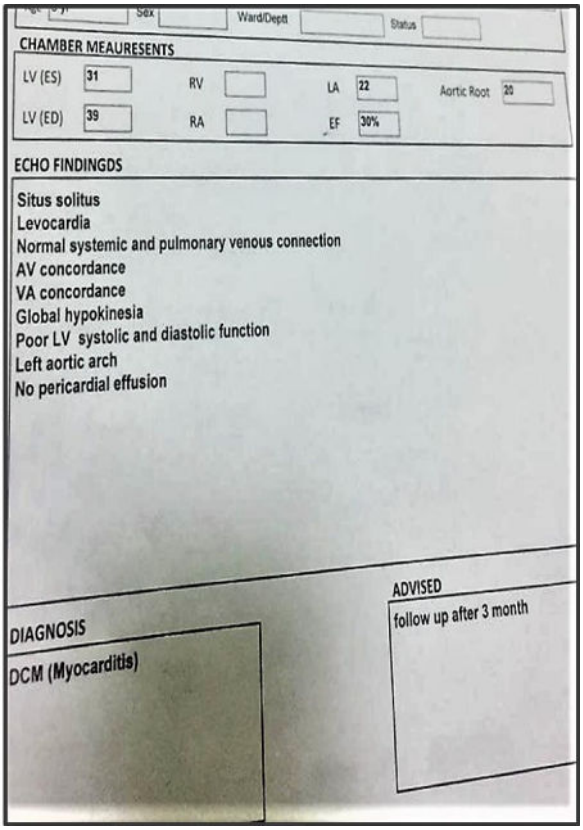


Figure 9 ECHO Report of the patient showing signs of dilated cardiomyopathy(myocarditis)

Discussion

In the pre vaccination era,Diphtheria was considered as 'the strangling angel of children'.Associated with high morbidity and mortality it is a severe yet preventable disease(5).In 1920s, vaccination against diphtheria toxoid was introduced(6).However it is still a cause of high morbidity and mortality in developing countries owing to insufficient vaccine coverage,overcrowding,low socio-economic status,delayed reporting to hospital,non-availability and delayed administration of antitoxin(6)(7) According to one of studies done in Belgium,Antwerp university hospital ,patient died of diphtheria due to renal failure and 3rd degree heart block despite of pacemaker placement with history of non availability of vaccine and late administration of antitoxin 7 days after admission to hospital but our patient survived after receiving

Figure 7 Vaccination card of the patient showing incomplete vaccination status

appropriate treatment and antitoxin without being vaccinated for disease[2].Another study in India by N.Dash analyzed the clinical picture of 99 children presenting with Diphtheria and showed that among other complications 35.4% developed Myocarditis and 27% developed neuropathy.This study showed further consistence with our report as two-thirds of patient were unimmunized and also C.diphtheria was isolated in only 28% patients(8).

S.Singh also highlighted the importance of early administration of Antitoxin by presenting the case of three patients who presented late in illness and developed myocarditis(9).A study from India by Manikyamba presented the pattern of polyneuropathy developed in 13 childern(5-13 years) within 15-40 days following diphtheria tonsillitis and out of them only one patient expired while 12 recovered by adequate treatment.This study is consistent with our report and attributes the good prognosis of diphtheric polyneuropathy to timely diagnosis and effective management.(10)A prospective study by Prasad presented the data of 39 children (3-18 years)diagnosed with diphtheria.Out of them 9 patients died owing to respiratory failure.After 4-49 days,28 children developed neuropathy even after receiving Antidiphtheritic serum and antibiotics.Out of them 18 children were unimmunized and 10 were partially immunized.Recovery rate of diphtheric polyneuropathy was 100%.This further emphasizes the need to closely follow up a patient of diphtheritic tonsillitis for neuropathy.(11)

Beuy Joob from Thailand expressed that in a recent Diphtheria outbreak in Thailand,Cardiac complication was more prevalent and no one developed neurological complication.This implies the need for close observation of diphtheria patients for non- neurological complications as well(12)Ramadhan reported the recent outbreak of diphtheria in Indonesia and assumed that it is associated with accumulation of vulnerable groups who are unimmunized or partially immunized owing to superstitious or religious beliefs.This further stresses the need for public education and awareness(13).

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Case Report

Intrauterine Torsion of the Finger

Naeem **Liaqat**[1], *Noor Ul Sabah Butt*[2], *Usama Iftkhar*[3], *Omer Faraz*[4], *Mudassar Fiaz Gondal*[5], *Muhammad Haider*[6]

[1] *Assistant Professor,Deprtment of pediatrci surgery Holy Family Hospital*
[2,3] *Post graduate trainee, Department of pediatric Surgery, Holy Family Hospital*
[4] *Assistant Professor, Deprtament of pediatric surgery, Holy Family Hospital*
[5] *Associate Professor, Deprtment Of Pediatric Surgery, Holy Family Hospital*
[6] *Registrar, Deprtment of orthopedics, Holy Family Hospital*

Abstract

A lot of newborns present with the post-axial polydactyly, but its intrauterine torsion and gangrene is a rare event. Only two cases have been reported previously in the literature. We are reporting a similar third case of intrauterine torsion of post axial polydactyly.

KEYWORDS: Polydactyly; Torsion; Child; Newborn

Introduction

Post axial polydactyly is one of the commonest congenital anomalies of skeletal system; its incidence is 1 in 500 live births. It is not yet being diagnosed on antenatal scan and patients present with polydactyly after birth. But intrauterine torsion of the extra appendage is a rare event (1,2,3).

Case Report

A male newborn presented to us within 6 hours of birth with bilateral post-axial polydactyly and gangrene of extra appendage on left side. He was weighing 3.2kg, first child in family, born via spontaneous vaginal delivery having smooth intra-natal and post-natal course. He was a product of non consengenous marriage with no history of any congenital anomalies in both parents. On examination, he had bilateral extra appendage along little fingers. On left side, it was completely necrosed and contained hemorrhagic fluid [figure 1] while on right, it was completely normal [figure 2]. Rest of his general physical and systemic examination was unremarkable. His ultrasound abdomen was also insignificant. After completing his examination, we performed the excision of both extra digits from their base by giving elliptical incision under local anesthesia. Baby was discharged to home after sometime and was healthy at follow up visit.

Figure 1:

Discussion

Polydactyly is a very common congenital skeletal anomaly with three major subtypes; i) Ulnar polydactyly, ii) Radial polydactyly, iii) central polydactyly. Among these, Ulnar is the most common sub-variety (1,2).

Congenital skeletal anomalies have seven varieties according to failure in their embryonic development. According to this classification polydactyly comes under the heading of duplication (3). Polydactyly is also associated with a variety of syndromes and 39 genetic mutations already have been detected for it. So, a complete neonatal workup should be done for every neonate presenting with polydactyly (1,4).

Temtamy and Mckurick classified the ulnar polydactyly into type A and type B. Type A included those varieties which are either originating at metacarpophalangeal joint (MCPJ) or at carpometacarpal joint. Type B included small nubbins to all pedicled non-functional extra-digits (5). Another classification is: Type I is duplication of soft parts only; Type II is partial duplication of the digit, including the osseous structures; and Type III is complete duplication of the digit, including the metacarpal, but is rare (8).

There are also some other classifications which divide polydactyly cases into 3 types (6). Treatment of type A is complex which involves the excision of whole of extra digit from its point of attachment and maintenance of functional ability of the hand (2,7).

As our case falls in the category of type B (Type I according to another classification) , so we discuss here only management of type B. First of all this condition should be treated as surgical emergency as it invariably leads to pain and infection. The treatment involved elliptical incision at the base of appendage and ligation of neurovascular bundle. Simple ligation of appendage leads to neuroma formation, hence, not recommended anymore. Excision of extra-digits is recommended in neonatal nursery which increases outcome (7). The management of Type II and Type III is more complex and it is preferable to wait for at least two to three years as by this time the anaesthesia risks recede, the hand is larger and technically surgery is easier to perform.

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Case Report

A Case Report of Isolated Sigmoid Stricture in an Infant Treated Conservatively For Necrotizing Enterocolitis

Laraib Rasool[1], Naeem Liaqat[2], Usama Iftkhar[3], Ameena Shahwar[4], Mehak Fatima[5], Jawad Abbasi[6]
[1,3,4,5,6]Post Graduate Resident, Deprtament of Pediatric Surgery, Holy Family Hospital, Rawalpindi
[2]Assisstant Professor, Department Of Pediatric Surgery, Holy Family Hospital

Abstract

Necrotizing enterocolitis (NEC) intestinal stricture is a rare but serious condition that may cause long-term morbidity and affect up to a third of newborns. In the ascending and descending bowels, transverse bowels, the hepatic and splenic flexures, and the sigmoid colon are all frequent sites of stricture. Stricture mostly involves right side of the gut. We hereby report a case of isolated sigmoid stricture after NEC in a male infant.
Keywords: necrotizing enterocolitis, stricture, sigmoid colon

Introduction

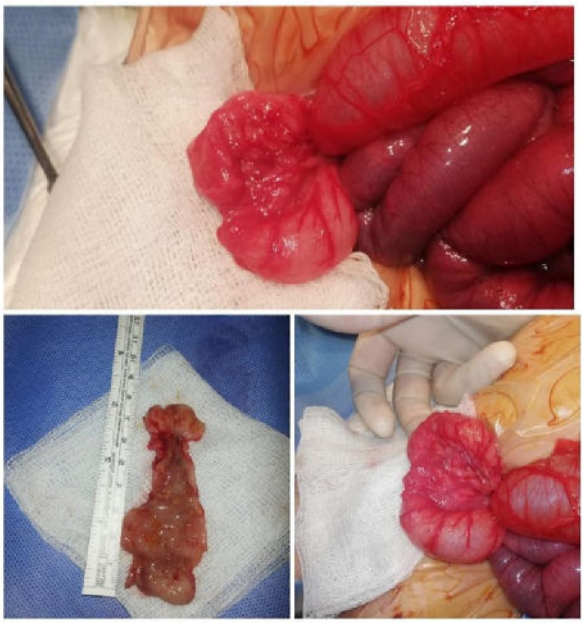
Enterocolitis necrotizing (NEC) is a disease of the gut that affects newborn babies. NEC is more likely to occur in premature babies. With substantial morbidity and death, it is the most frequent new-born surgical emergency, outpacing all other digestive disorders needing surgical care. Approximately one-third of individuals who have recovered from acute NEC develop intestinal strictures following conservative treatment. The colon and terminal ileum are the two most frequent sites for stricture formation (15 percent). The left colon is involved in almost 60% of all strictures, with the splenic flexure being the most frequent location. We report a case of a solitary sigmoid stricture following conservative treatment for NEC, which is very uncommon.

Case Report

A male neonate presented at the age of 07 days with the complaints of fever, bilious vomiting, mild abdominal distension and dehydration. Patient was born pre-term via caesarean section and weight of the patient was 1.7 kg. He was diagnosed as NEC and managed conservatively via IV fluids and broad-spectrum Intra venous antibiotics. Patient was stabilized and kept under observation for next one week. Patient was discharged after 10 days of hospital stay after establishing oral feed. He presented again with complaints of abdominal distension, profuse vomiting and inability to pass stools for last 5 days at the age of 2 months. On examination, he was febrile, tachycardic and had distended abdomen along with sluggish bowel sounds. X-ray abdomen showed dilated gut loops up till the level of descending colon. Once conservative management failed and condition didn't improve patient was explored and isolated stricture involving 3cm length of sigmoid colon was found. Stricture was non-negotiable. Involved portion of the colon was excised and primary anastomosis was done [Figure 1]. Post-operative course was

unremarkable and patient discharged on 7th post-operative day.

Figure 1:



Discussion

Intestinal stricture after surgically and medically managed patients of NEC occurs as a late complication and affects 20% of survivors of NEC. In watershed regions where vascular flow is disrupted and ischemia is occurring, NEC-induced constriction is more common. The left side of the colon accounts for 80% of post-NEC strictures, with the small bowel accounting for the other 20%. Only around 15% of patients with a stricture develop multiple strictures. Post-NEC colon strictures have been seen in the left colon, primarily in the transverse and sigmoid segments. There is a link between post-NEC stricture development and elevated CRP levels throughout the course of NEC, indicating that there is a risk for post-NEC stricture development. Best diagnostic tools are suspicion and barium enema. Stricture is most commonly seen in patients with history of NEC, failure to thrive, symptoms of obstruction, previous exteriorization or peritoneal drainage for NEC perforation[i,ii,] [iii]Contrast enema is considered to be first radio intervention for identifying location and extent of strictures. Our patient had clear signs of intestinal obstruction therefore we didn't have time for contrast studies.

Hemorrhagic necrosis is most common on the mucosa, although it may spread throughout the whole intestine. A condition known as full thickness necrosis will result in a hole in the skin. A necrotic lesion affecting the gut walls and the inner layer muscularis may result in strictures. Necrotic tissue will be sloughed away, and granulation tissue will develop around the margins that are still alive. With time, granulation leads to the formation of strictures as fibrous tissue is laid down and the wound contracts. (1) Splanchnic vasoconstriction in hypoxic individuals resulting to ischemic necrosis is an important element in the pathogenesis of NEC. It is possible that inflammation caused by faecal material with necrotic mucosa may help promote the ischemia process. The histology changes with the age of the lesion, although submucosal fibrosis is the hallmark of a stricture.

In the treatment of strictures, there are many options, including externalising the area, diverting the blood flow away from it, and performing primary repair or resection. The surgeon's preference and the child's overall health determine which surgical procedure is used. Tissue that has become inflamed should be surgically removed. Children with limited cardiac reserves, severe sickness, or non-distinct stricture edges should be redirected or treated with parenteral nourishment until all current problems are resolved... One of the most common post-surgery complications is the development of a fistula with a short intestine.

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Case Report

Hydatid Pseudo Aneurysm of Thoracic Aorta

Nida Farrukh[1], Muhammad Hanif[2], Umar Zia Warriach[3]

[1,3] Post graduate Resident, Surgical Unit 2, Benazir Bhutto Hospital, Rawalpindi

[2]Professor of surgery, head of Department, Benazir Bhutto Hospital, Rawalpindi

Abstract

Hydatidosis of aortic wall is a rare and potentially fatal condition. In this article, we report a rare case of pseudo saccular aneurysm of lower descending thoracic aorta because of hydatidosis ; surgical excision was performed with primary repair of aorta. This report emphasizes the need for early diagnosis of hydatid cyst with high index of suspicion particularly if in the vicinity of a major vessel and aggressive investigations followed by subsequent early treatment before disabling and life-threatening complications occur.

Introduction

Commonly called Dog tape worm, hydatid disease is caused by Echinococcus granulosus; such a parasite is endemic in many sheep-raising areas in the world, especially in Mediterranean countries, North Africa, and South America1.

Dog is the definitive host and as a pet is the common source of infection transmitted to intermediate host- humans, sheep and cattle[2]. In the typical cycle, tapeworm eggs are passed in the feces of the infected dog and subsequently be ingested by the intermediate host. There in the intestine, they hatch into embryos and carried to major filtering organs (mainly liver and/or lungs) by blood throughout the body. The developing embryos transform and develop into larval echinococcal cysts after localizing in a specific organ or site[3].

This disease can effect any organ of the human body, but the most common site being the liver, where it is found as a single site in 60% of the cases. Lungs become the second most frequent site (20% to 25%); other organs, such as the kidneys, the spleen, the mesenteries, the bones, and the brain are less frequent localizations. Hydatid cyst involving the aortic wall is a rare unusual manifestation of disease, either localizing primarily or eroding from the adjacent tissues, with a high mortality rate.[4,5,6,7,8.]

The clinical presentation of hydatid cyst in vascular tree is variable, ranging from rupture of hydatid cyst presenting as acute arterial embolization resulting in peripheral ischemia to mild symptomatic pain regionally as in our patient.

Case Report

A 32 years old lady, resident of Rawalpindi presented to the Accident & Emergency department in October 2018 with complaints of left hypochondruim pain which exacerbated since last 2 weeks at the time of presentation. It

was mild in intensity, intermittent in nature with occasional radiation to lumbar region and back. No other associated symptoms or fever was reported. Her clinical examination remained unremarkable. Her general physical examination revealed no positive finding. In chest, there was normal vesicular breathing, bilateral equal air entry with normal vocal resonance and no added sounds. The abdominal examination also remained unremarkable with no clinically palpable mass.

As clinical evaluation did not help in making a working diagnosis, we proceeded with the investigations. Abdominal ultrasound was performed which showed a complex echoes mass with peripheral cystic areas and central hyper echoic area in the perispleenic/LHC area measuring 12.3x9.7cm giving the suspicion of presence of hydatid cyst. Working diagnosis of hydatid cyst was made arising from the peri spleenic area. Patient underwent further investigations. Anti echinococcus granulosus antibodies IgG were found to be raised (38.4 U/ml – reference values are more than 11 U/ml). Other labs were found to be in normal limits (eosinophils – 3%) except positive anti HCV antibodies which was an incidental finding.

To verify the anatomical details, computed tomographic thoraco-abdominal scan was done which showed a large well defined multi-locular cystic lesion measuring 12.5x9.2x11cm (CCxTRxAP) in the left sub-phrenic retro-crural region displacing the diaphragm anterosuperiorly causing reduced left lung volume with few intra-parenchymal atelectatic bands, displacing stomach anteriorly and abutting the inferior surface of left lobe of liver. Descending thoracic aorta shows tortuous course due to mass effect of the cystic lesion partially encasing descending aorta with a contrast filled blind ending out pouching measuring 16x21mm extending into mass lesion. Abdominal aorta also showed a kink just below the origin of aneurismal sac causing focal narrowing (measuring 7mm) at the level of T9 vertebra.In radiological opinion, other possibility of lobar sequestration with super added infection was given. (Figure 1 & 2).

TREATMENT

With the diagnosis of hydatid cyst causing mass effects on the thoracic aorta in mind, surgery was planned. Oral albendazole was started 14 days before the operative procedure was undertaken after anesthesia fitness with all pre-requisites performed including echocardiography and pulmonary function tests. As a prophylactic measure, aortic bypass graft was arranged pre-operatively.

Under General Anesthesia, we proceeded with thoracotomy + laprotomy by left thoracoabdominal incision. Per-operatively a huge saccular aneurysm (25x15cm) was found to be arising from the descending thoracic aorta 10 cm above the diaphragmatic opening. Diaphragm was divided circumferentially around the cyst, proximal and distal control of aorta was achieved, cystic wall of hydatid pseudo aneurysm was incised and contents evacuated using hypertonic saline first as the solicidal agent. Contents were evacuated meticulously to avoid any anaphylactic reaction and wall of the cyst excised. Primary rent in the aorta was repaired contents of cyst (daughter cysts) and excised wall was sent for histopathology. (See Figure 3 & 4). Histopathology report later confirmed our diagnosis of hydatid disease.

OUTCOME

After surgery patient was shifted to Intensive Care Unit and albendazole was continued post operatively. Bilateral lower limb pulses were confirmed by hand held Doppler in the immediate post-operative period. Patient was having smooth recovery until she developed ventilator associated pneumonia (VAP). Antibiotics were given according to the cultured organism but unfortunately the infection worsened and she developed sepsis. Organ support was continued and tracheostomy was done on 10th post-operative day. VAP and sepsis could not be brought under control and she progressively developed multi organ failure.

Despite supportive treatment, on 25th post-op day, patient could not be revived and expired.

Discussion

Following nonvascular thoracic surgery, the exact incidence of thoracic aortic pseudoaneurysm is unknown.[9] This case makes evident how diverse the localization of cyst and the clinical manifestations of this infection can be with such vague symptoms making diagnosis tricky on clinical examination. Because of the rarity of this case, limited data was found. This is probably the first documented case of its type reported in Pakistan. Primary involvement of the aortic wall is very rare. When such case is encountered and involvement of a nearby vessel is suspected, knowledge about the anatomical details becomes mandatory. Multiple cysts in the aneurysmal sac can be visualized by CT scan and MRI assisting in making the differential diagnosis. The communication between aortic lumen and the cyst can be defined by angiography.[10]

Many hypotheses have been proposed to explain arterial -- especially aortic -- localization. Some authors suggest hydatid cysts in adjacent tissues being the cause of erosion of arterial wall, and some believe that the parasite localizes primarily in the aortic wall, in such cases with coexisting aneurysm or an endothelium defect in the vessel.[10] Others propose that the arrival of the parasite in the vessel is via the vasa vasorum.[1,4] In every case, a pseudoaneurysm has been formed following the localization of the parasite in the aortic wall.[4,5,6,7,8,11,12]

This report emphasizes on the need for early diagnosis of hydatid cyst with high index of suspicion particularly if in the vicinity of a major vessel and requirement of aggressive investigations to assess the anatomical extent of disease followed by subsequent early treatment before disabling and life-threatening complications occur. Morbidity is usually related to rupture with or without anaphylaxis, infection or dysfunction of the effected organ.[13]

Although an element of diagnostic disparity was in mind because of the above mentioned other radiological opinion, this case was very likely a primary cyst of the aortic wall. Clinical examination did not help in making the working diagnosis in our case. Radiological and serological investigations helped in reaching close to the diagnosis. Diagnosis is usually made with the help of serologic tests.[10] Serological tests carries a wide range of sensitivity and specificity and is dependent on the purity of the antigens utilized.[13] Serological tests used to diagnose hydatid disease include indirect hemagglutination(IHA) and immunoelctrophoresis, recently more advanced tests include ELISA and western blotting. ELISA has sensitivity of 84% and specificity of 96.6%.[14] For our patient, ELISA was done which showed raised anti Echinococcus granulosus antibodies IgG titer (38.4 U/ml).

Major complications in this type of pathology regardless of any surgical procedure include anaphylactic shock and the systemic dissemination of the daughter cysts caused by the rupture of the cyst.[10] If such cases are suspected, like in this case, chemotherapy or PAIR cannot resolve this problem well. There is contraindication to chemotherapy in cysts that are at risk of rupture[15,16]. Anthelmintic therapy causes degenerative changes in the cyst wall promoting rupture. Large cysts (>6 cm diameter) particularly carries high risk.[16]

Unlike most of the surgical series, there is a selection bias in percutaneous therapy (PAIR) as a safe and successful procedure requires certain prerequisites.[17] PAIR can't be performed as such in arterial hydatid cyst due to the risk of rupture, dissemination, and anaphylaxis reaction. It is more commonly done in hepatic hydatid cysts. PAIR can be performed after using endovascular prosthesis and chemotherapy in selected cases.

The role of benzimidazoles before surgery is controversial. The proponent view is that preoperative use of benzimidazoles softens the cysts and reduces the intracystic pressure simplifying its removal and reducing the risk of

secondary hydatidosis and recurrences. Benzimidazoles also significantly reduce the viability of the protoscolex. Recent evidences on the other hand advocates that the preoperative use of benzimidazoles should be avoided in larger lung cysts due to the risk of rupture. However, postoperatively, all patients should receive albendazole (10 mg/kg per day) for a period of 6 – 8 weeks to prevent recurrence of the disease.[18]

The indications for surgery include large cysts that are at risk to rupture, infected cysts, cysts in vital anatomical locations, and cysts exerting substantial mass effect[16]. Parasitic cyst creating pseudoaneurysm of the vessel is considered to pose a high risk for vessel rupture. Working in the vicinity of a major vessel, surgical resection of the mother cyst becomes critical. Accuracy is required to avoid systemic dissemination. Like in this case, limited data and evidence is present regarding any standard surgical procedure and suggests aortic reconstruction as the treatment of choice whenever possible[10].

In patients, in whom, a complete surgical resection is considered to be at high risk for systemic dissemination of the disease and anatomically feasibility is there, endovascular treatment is considered a treatment option when aorta is the site of parasitosis, combined with chemotherapy, PAIR, and radiofrequency treatments[10] but in our setup this was not one of the treatment options because of lack of such facilities.

Conclusion

This was a rare case of hydatid cyst creating pseudo aneurysm of the thoracic aorta. This type of parasitic cyst is considered to pose a high risk for vessel rupture. No standard surgical technique currently is recommended regarding the management of patients with arterial hydatid cysts because of the rarity of these events. In such cases, like in this case, surgical resection of the cyst with meticulous technique avoiding the spillage into systemic circulation which is critical to avoid dissemination, and aortic reconstruction should be the treatment of choice whenever possible.

TAKE HOME POINTS

- If hydatid cyst is found in vicinity of a major vessel, there should be a high index of suspicion with emphasis on early diagnosis before disabling and life-threatening complications occur.
- Clinical examination is unreliable in making the diagnosis. Serological tests cannot be completely relied on as they have a wide range of sensitivity and specificity and is dependent on the purity of the antigens utilized.
- Aggressive investigation is required in such cases to assess the anatomical extent of disease followed by subsequent early treatment.
- In such cases, like in this case, surgical resection of the cyst with meticulous technique avoiding the spillage into systemic circulation which is critical to avoid dissemination, and aortic reconstruction should be the treatment of choice whenever possible
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