

COVID-19 Mortality and Morbidity Rate in a Tertiary Care Hospital Swat, Pakistan

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ABSTRACT

Background: Because of the recent outbreak of Covid-19, the globe is now facing a number of difficult challenges. The morbidity and mortality rate varies depending upon numerous factors.

Objective: The objective of the study was to find out the mortality and morbidity rate of Covid-19 in a tertiary care hospital of Swat

Methodology: This descriptive cross-sectional study was carried out at the Department of Pathology, Swat Teaching Hospital, Swat, Khyber Pakhtunkhwa Pakistan for duration of one year from April 2020 to March 2021. Nasopharyngeal or Oropharyngeal swabs were taken from all the enrolled patients and sent to the national institute of health Islamabad or swat public health laboratory for the diagnosis of Covid-19. The rate of morbidity and mortality for all the enrolled patients was recorded. All the data analysis was done by using IBM SPSS version 23.

Results: In the current study, totally 11609 patients were enrolled. There were 7329 (63.13%) males and 4280 (36.87%) females. The overall morbidity rate of covid-19 was 18.25% (n= 2089) whereas the overall mortality rate was 13.16% (n=275) patients.

Conclusion: Our study concludes that the rate of morbidity and mortality of covid-19 is high in district Swat Khyber Pakhtunkhwa, Pakistan. The burden of covid-19 was high in males as compared to females and the mortality rate increases with the increase in age. All the people residing in the district Swat should be vaccinated to decrease both the morbidity and mortality rate of covid-19.

Keywords: Covid-19; Mortality; Morbidity; Swat

INTRODUCTION

Because of the recent outbreak of Covid-19, the globe is now facing a number of difficult challenges¹. Wuhan was the first epidemic location of Covid-19 December 2019 and spread rapidly over the whole nation was thought to be pneumonia with a novel etiological agent². On February 11th, 2020, WHO named this novel virus as COVID-19 (Corona virus disease 19)³. The health ministry of Pakistan announced the first Covid-19 case on 26th February 2020, in Karachi, while the second case was verified in Islamabad on the same day⁴.

According to the WHO, up till now covid-19 has caused 2,803,975 fatalities and 128,229,141 infections worldwide. A total of 659,116 confirmed illnesses and 14,256 fatalities put Pakistan in the 31st position on the list of high-burden nations⁵. The rate of mortality in Pakistan, which is 2%⁶, is similar to India (1.45%), although it is less as compared to Iran (4.68%) and many other European nations, such as the UK and Italy where the reported mortality is 3.43% and 3.52% respectively⁵. The causes of this fluctuation in mortality are not well understood, although a complex interaction of viral immunogenicity, host genetics, demographics, and climatic variables may be involved⁷. The first wave's infection peaked in mid-June, when a mean of 7000 new illnesses were reported per day, and the day with the most fatalities was June 20, 2020, when 153 people died. The health care system was put under pressure since major hospitals in all of the major cities were overburdened.

During the COVID-19 sickness, there has been a significant focus on the occurrence of pre-existing co-morbid conditions in patients and how they may affect disease outcomes. It has been shown that a number of pre-morbidities are common and may lead to more severe illness and poorer outcomes for individuals. Chinese research studies were the first to show that COVID-19 patients usually had chronic pulmonary and neurological ailments, as well as co-morbidities including obesity, diabetes, cardiovascular problems and hypertension^{8,9}. Studies have also shown a possible link between co-morbidities and severe illness consequences, such as admission in intensive care unit, need for invasive ventilation, and mortality^{10,11}.

Currently in our setting, no study on mortality and morbidity of covid-19 has been conducted so far. Therefore this study was carried out to determine the burden of Covid-19 and computation of mortality rate in a tertiary care hospital Swat Pakistan.

MATERIALS AND METHODS

This descriptive cross-sectional study was carried out at the department of Pathology, Swat Teaching Hospital, Swat, Khyber Pakhtunkhwa Pakistan. The duration of study was one year from April 2020 to March 2021. The study approval was properly taken from the ethical and research committee of the hospital. The criteria for inclusion in the current study were all the suspected patients of covid-19 of both the gender and all ages attending or admitted in the swat teaching hospital. The exclusion criteria were patients not suspected for covid-19. The main objective of the current study was explained to all the patients or their parents/guardians for consent form. A total of 11612 patients were enrolled during the specified time our study. All the patients with symptoms like cough and fever were admitted in the specified covid-19 ward of the hospital till the confirm diagnosis of covid-19 according to the guidelines of world health organization. Nasopharyngeal or Oropharyngeal swabs were taken from all the enrolled patients and sent to the national institute of health Islamabad or swat public health laboratory for the diagnosis of Covid-19. A modified Charge Switch Forensic DNA Purification Kit of Invitrogen Life Technologies, was used for extraction of RNA. To guarantee the highest level of ethical standards, our research followed the Helsinki Declaration and the International Ethical Standards for research on human health. All the demographic information's of the patients were recorded on a pre-designed Performa. The rate of morbidity and mortality for all the enrolled patients was recorded. All the data analysis was done by using IBM SPSS version 23. For variables like gender, morbidity and mortality, frequency and percentage were determined whereas for variables like age, means and standard deviation were determined. For association of categorical variables with the morbidity and mortality of covid-19, chi-square test was used. The p value of <0.05 was considered significant statistically.

RESULTS

In the current study, totally 11609 patients were enrolled. There were 7329 (63.13%) males and 4280 (36.87%) females. (Figure 1) The mean age in this study was 36.67 with the mean standard deviation of 19.75. The minimum age was two days whereas the maximum age was 120 years. All the enrolled patients were resident of district Swat. Based on the age wise distribution, 2650 (22.83%) patients were in 0-20 years age group, 4790 (41.26%) patients in 21-40 years age group, 2719 (23.42%) patients in age group 41-60 years, 1278 (11%) patients in age group 61-80 years, 167 (1.43%) patients in age group 81-100 years while in age group 101-120 years, only 5 (0.04%) patients were observed. (Figure 2) Based on polymerase chain reaction (PCR), covid-19 was detected in 2089 (18.25%) patients while it was not detected in 9355 (81.75%) patients. (Figure 3) Finally 11944 patients were included in this study, as 72 (0.62%) results were inconclusive, 14(0.12%) samples were rejected, 55 (0.47%) samples were labeled as missed while for 21 (0.18%) patients fresh blood sample were needed. Based on gender distribution, covid-19 was detected in 701 (16.69%) females while amongst males it was detected in 1388 (19.16%) patients. (p=0.001)(Table 1)

Based on the age wise detection of covid-19, 180 (6.90%) patients were covid-19 positive in age group 0-20 years, 840 (17.70%) patients were covid-19 positive in age group 21-40 years, 647(24.11%) patients in age group 41-60 years, 380 (30.87%) in age group 61-80 years, 40 (23.53%) patients in age group 81-100 years while covid-19 was detected in 2 (40%) patients in age group 101-120 years. (p=0.001) (Table 2) The overall mortality rate in the current study was 13.16% (n=275). (Figure 4) On the basis of gender wise mortality, the mortality rate observed in females was in 106 (15.12%) patients while in males, mortality was observed in 169 (12.18%) patients. (p=0.001) (Table 3) Based on the age wise mortality, only one case (0.36%) of mortality was observed in age group 0-20 years, 19 (6.91%) cases in 21-40 years age group, 120 (43.64%) cases in age group 41-60 years, 122 (44.36%) cases in age group 61-80 years, 11(4%) cases in age group 81-100 years while in 2 (100%) cases, mortality was observed in age group 101-120 years (p=0.001).(Table 4)

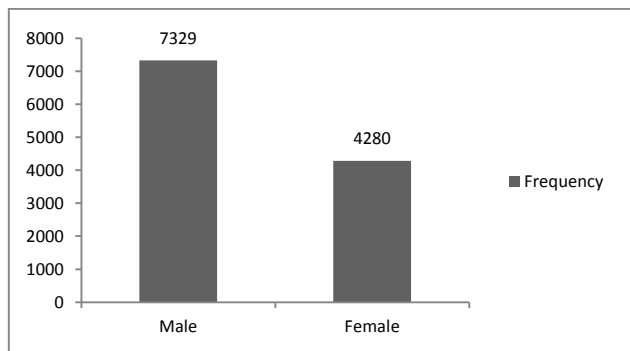


Figure 1: Gender wise distribution of the patients

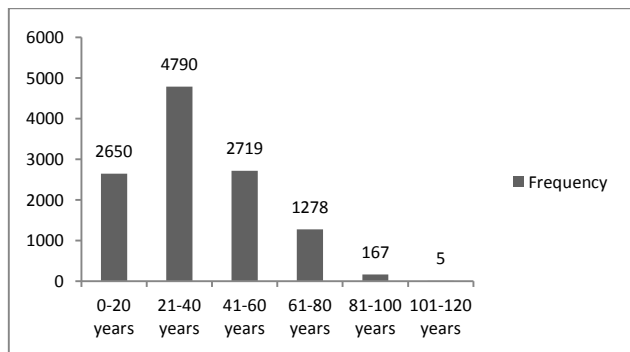


Figure 2: Age wise distribution of the patients

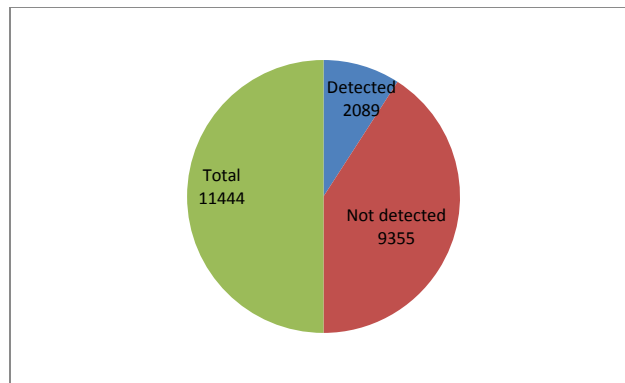


Figure 3: Overall morbidity rate of covid-19

Table 1: Association of gender with the morbidity of covid-19

Gender	Detected N (%)	Not detected N (%)	P
Male	1388 (19.16%)	5855 (80.84%)	0.001
Female	701 (16.69%)	3500 (83.31%)	
Total	2089 (18.25%)	9355 (81.75%)	

Table 2: Association of age with the morbidity of covid-19

Age group	Detected N (%)	Not detected N (%)	P value
0-20 years	180 (6.90%)	2430 (93.10%)	0.001
21-40 years	840 (17.70%)	3905 (82.30%)	
41-60 years	647 (24.11%)	2036 (75.89%)	
61-80 years	380 (30.87%)	851 (69.13%)	
81-100 years	40 (23.53%)	130 (76.47%)	
101-120 years	2 (40%)	3 (60%)	
Total	2089	9355	

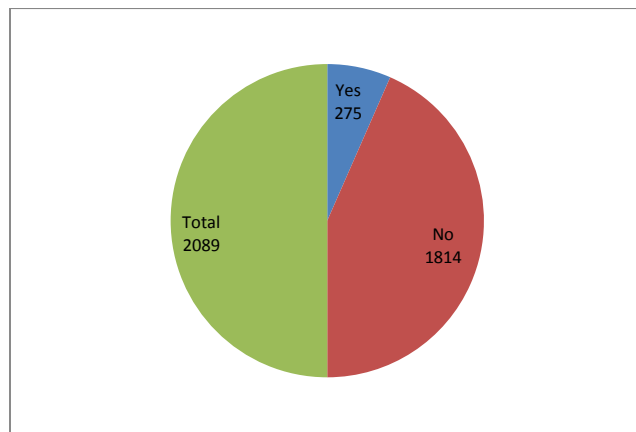


Figure 4: Overall mortality rate of covid-19

Table 3: Association of gender with the mortality of covid-19

Gender	Mortality Yes N (%)	Mortality No N (%)	P
Male	169 (12.18%)	1219 (87.82%)	0.001
Female	106 (15.12%)	595 (84.88%)	
Total	275 (13.16%)	1814 (86.84%)	

Table 4: Association of age with the mortality of covid-19

Age group	Mortality Yes N (%)	Mortality No N (%)	P value
0-20 years	1 (0.36%)	179 (99.44%)	0.001
21-40 years	19 (6.91%)	821 (93.09%)	
41-60 years	120 (43.64%)	527 (56.36%)	
61-80 years	122 (44.36%)	258 (55.64%)	
81-100 years	11(4%)	29 (96%)	
101-120 years	2 (100%)	000	
Total	275 (13.16%)	1814 (86.84%)	

DISCUSSION

The various diseases caused by a large family of viruses called coronaviridae ranges from common cold to severe problems like MERS (Middle East Respiratory Syndrome)¹². The Chinese city, Wuhan was the first known location of Covid-19 infection in December 2019, and it has since spread to more than 213 nations¹³. Management of covid-19 is a global health issue that affects both industrialized and developing countries¹⁴. Given the fast exchange of information, numerous problems remain unresolved, and many treatments lack conclusive evidence¹⁵. The prevalence and mortality of Covid-19 in developing nations, notably Pakistan, are still poorly understood, despite the abundance of information presently available on the disease's clinical symptoms and basic epidemiology.

In the current study, a total of 11444 patients were enrolled finally and based on polymerase chain reaction (PCR), covid-19 was detected in 18.25% patients. In accordance with our study, a recent study carried out by Fazal Rahman et al. reported 22.4% morbidity rate in their study¹⁶. A recent study carried out by Sarah Arif et al. reported 6% prevalence of covid-19 which is not in accordance with our study¹⁷. Other studies also reported contrasting results as compared to our findings^{18, 19}. A recent study reported 19% morbidity rate which is almost similar to our findings²⁰.

In the current study, based on gender distribution, covid-19 was detected in 16.69% females while amongst males it was detected in 19.16% patients ($p=0.001$). In accordance with our study, a high morbidity rate of covid-19 was observed in males as compared to females¹⁶. This might be due to involvement of males in outside home activities as compared to females due to which more males are exposed to the covid-19 infection. Another study also reported comparable results and shows that more males are infected by covid-19 as compared to females²¹.

In our study, based on the age wise detection of covid-19, 6.90% patients were covid-19 positive in age group 0-20 years, 17.70% patients were covid-19 positive in age group 21-40 years, 24.11% patients in age group 41-60 years, 30.87% in age group 61-80 years, 23.53% patients in age group 81-100 years while covid-19 was detected in 40% patients in age group 101-120 years. ($p=0.001$) In a previous study, high morbidity rate was observed in a age group 30-40 years which is not in accordance with our study¹⁶. In our study high morbidity was observed in age group 101-120 years which might be due to very less no of patients in this group.

In our study, the overall mortality was 13.16%. These findings are not in accordance with the previous study who reported 1% mortality rate¹⁶. Another study reported 4.5% mortality rate which is also not in accordance with our findings²². Another study reported a very high mortality rate (39%) as compared to our findings²³.

In our study high mortality rate was observed in females (15.12%) as compared to males (12.18%) ($p=0.001$). In contrast to our findings other studies reported high mortality rate in males than females²⁴⁻²⁶.

Based on the age wise mortality, only one case (0.36%) of mortality was observed in age group 0-20 years, 16.91% cases in 21-40 years age group, 43.64% cases in age group 41-60 years, 44.36% cases in age group 61-80 years, 4% cases in age group 81-100 years while in 100% cases mortality was observed in age group 101-120 years ($p=0.001$). A previous study reported comparable results which shows that covid-19 mortality rate is high in old age people as compared to young people¹⁶.

CONCLUSION

Our study concludes that the rate of morbidity and mortality of covid-19 is high in district Swat Khyber Pakhtunkhwa, Pakistan. The burden of covid-19 was high in males as compared to females and the mortality rate increases with the increase in age. All the

people residing in the district Swat should be vaccinated to decrease both the morbidity and mortality rate of covid-19.

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