DOI: https://doi.org/10.53350/pjmhs2115123745

ORIGINAL ARTICLE

Comparison of Mortality between Health Workers and General Population Infected with Covid-19

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ABSTRACT

Objective: The main purpose of this study is to compare the mortality between health workers and general population infected with coronavirus disease.

Study Design: Comparative/Retrospective study

Place and Duration: Study was conducted at Medicine and Gastroenterology department of Ayub Teaching Hospital, Abbottabad for duration of six months from 1st January 2021 to 30th June 2021.

Methods: In this study 250 patients of both genders with coronavirus infection were presented. Age of the patients was between 18-70 years. Informed written consent was taken from all the cases for baseline details including age, sex, body mass index, socio-economic status and residency. Included patients were both symptomatic and asymptomatic to disease. Among 250 cases 125 patients were in the general population included in group I while other 125 cases were health workers included in group II. Patients were admitted to the hospital and examined for recovery. Outcomes among both groups were assessed and compared in terms of ICU admission, ventilation requirement and rate of mortality. We used the SPSS 25.0 version to analyze complete data.

Results: In group I, 65 (52%) patients were males and 60 (48%) cases were females with mean age 47.66±8.87 years and in group II, 70 (56%) were males and 55 (45%) females with mean age 27.66±8.87. Mean BMI in group I was 25.11±8.33 kg/m^2 and in group II, body mass index was 22.32±7.54 kg/m^2. Majority of the patients i.e 73 (58.4%) in group I had poor socio economic status but in group II 50 (40%) cases had poor economic status. Majority of the cases among both groups were from urban areas 75 (60%) and 85 (64%). 48 (38.4%) were symptomatic in group I and 53 (42.4%) were in group II. Hypertension, diabetes mellitus and heart disease were the most common comorbidities. Frequency of ICU admission, ventilation requirement and mortality was significantly higher in general population 19 (15.2%), 24 (19.2%), 14 (11.2%) as compared to health workers 6 (4.8%), 7 (5.6%) and 5 (4%) with p value < 0.05.

Conclusion: We concluded in this study that the severity of pandemic disease among general population was higher because of less use of preventive measures as compared to health workers and frequency of deaths, ICU admission and use of invasive ventilation in general population were also very high.

Keywords: Mortality, ICU, Ventilation, General Population, Health workers, Coronavirus

INTRODUCTION

It was reported late in December 2019 [1, 2] that a viral pneumonia outbreak had broken out in Wuhan, Hubei Province, China. Because of the rapid increase in the number of infected individuals and the number of affected nations, the novel coronavirus infection 2019 (also known as COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has emerged as a critical public health problem [3, 4]. CoVid-19 was officially declared a pandemic by the World Health Organization (WHO) on March 11, 2020, and by of December 8th, 218 nations and territories have reported more than 68 million CoVid cases, with over 1.5 million patients dying and slightly more than 47 million cases recovered.

A large number of people, including health-care personnel, are at high risk for developing the disease (HCWs). An illness related to SARS, known as severe acute respiratory syndrome (SARS), has taken a toll on health-care professionals in previous outbreaks. During the SARS pandemic in 2002, the World Health Organization (WHO) recorded 8098 cases and 774 (9.6 percent) deaths, with health-care workers (HCWs) accounting for 1707 cases (21 percent). Furthermore, Singapore reported that health-care personnel were responsible for 41 percent of the 238 probable SARS cases [4] that had been identified. One of the most critical difficulties in the present COVID-19 outbreak is occupational contact among health care workers (HCWs), and it must be treated completely and effectively. Protecting the safety of health-care workers is critical not just for guaranteeing the continuity of patient treatment, but also for preventing the spread of the virus. COVID-19 has infected at least 90,000 healthcare personnel, with more than 260 nurses dying as a result of the outbreak, according to reports [5].

In light of the coronavirus disease 19 (Covid-19) pandemic, illness among healthcare workers (HCWs) is of special concern. Generally speaking, health-care workers (HCWs) are exposed to infectious diseases at higher rates than the general population in the surrounding community, and they may therefore act as disease vectors [6]. Pathogen exposure on a frequent basis in HCWs may have an impact on the course of infectious disease as compared to the general population in the surrounding community.. There has been minimal examination into how HCWs who were exposed to Covid-19 fared and whether their illness development differed from that of non-HCWs in this situation.

According to a CDC Morbidity and Mortality Report published in April 2020 [7], health-care workers were responsible for 3 percent of COVID-19 cases in the United States. HCWs were responsible for 11 percent of all Covid-19 patient cases in states that reported the status of all Covid-19 patients [7].

A rise in infection and mortality rates among health-care workers will stall a country's response to COVID-19 and have a significant, long-term impact on healthcare delivery, particularly in health-care systems that are already struggling with workforce shortages due to a lack of trained personnel, skilled labour migration, and geographic maldistribution, even before the pandemic. [8-10] To plan for the present and the future, countries must keep track of the number of HCWs who have been infected with COVID-19 and have died in order to plan for the future. It is not known if or not data on COVID-19 infection and death among health-care workers is collected and published around the world.The main purpose of this study is to compare the mortality between health workers and general population infected with coronavirus disease.

MATERIAL AND METHODS

This comparative/retrospective study was conducted at Medicine and Gastroenterology department of Ayub Teaching Hospital, Abbottabad for duration of six months from 1st January 2021 to 30th June 2021.

The study comprised of 250 patients of coronavirus disease. Informed written consent was taken from all the cases for baseline details included age, sex, body mass index, socio-economic status and residency. Patients < 18 years of age and those did not give any written consent were excluded from this study.

Patients ranged in age from 18 to 70 years. Both symptomatic and asymptomatic patients were included in this study. Individuals who had unprotected close contact with a confirmed COVID-19 case were tested based on their symptoms. The WHO devised a methodology for RT-PCR assays, which were followed exactly. Prior to the start of the study, we defined all of the data and variables, and we used a library of definitions to train our data abstractors. Physicians, nurses, technicians, and other support staff who have direct contact with patients were included in the category of healthcare workers. Hypoxemia was defined as an oxygen saturation of less than 94%, whereas tachypnea was defined as a respiratory rate of more than 24 breaths per minute. Fever was defined as a temperature above 38° C, while lymphocytopenia was defined as a lymphocyte count below 1000/ml. Among 250 cases 125 patients was general population included in group I while other 125 cases were health workers included in group II. Patients were admitted in the hospital and examined for recovery. Outcomes among both groups were assessed and compared in terms of ICU admission, ventilation requirement and rate of mortality. We used SPSS 25.0 version to analyze complete data.

RESULTS

In group I 65 (52%) patients were males and 60 (48%) cases were females with mean age 47.66±8.87 years and in group II 70 (56%) were males and 55 (45%) females with mean age 27.66±8.87 years. Mean BMI in group I was 25.11±8.33 kg/m^2 and in group II body mass index was 22.32±7.54 kg/m^2. Majority of the patients 73 (58.4%) in group I had poor socio economic status but in group II 50 (40%) cases had poor economic status. Majority of the cases among both groups were from urban areas 75 (60%) and 85 (64%). (table 1)

Table 1: Baseline detailed demographics of enrolled cases

Variables	Group I	Group II
Mean Age (years)	47.66±8.87	27.66±8.87
Mean BMI (kg/m^2)	25.11±8.33	22.32±7.54
Gender		
Male	65 (52%)	70 (56%)
Female	60 (48%)	55 (45%)
Socio-economic status		
Poor	73 (58.4%)	50 (40%)
Good	52 (41.6%)	75 (60%)
Residency		
Urban	75 (60%)	85 (64%)
Rural	50 (40%)	40 (36%)

48 (38.4%) were symptomatic in group I and 53 (42.4%) were symptomatic in group II. Hypertension, diabetes mellitus and heart disease were the most common comorbidities. (Table 2)

Table 2: Association of comorbidities and symptoms among both groups

Variables	Group I	Group II
Symptomatic		
Yes	48 (38.4%)	53 (42.4%)
No	77 (61.6%)	72 (57.6%)
Comorbidities		
Hypertension	50 (40%)	55 (44%)
Diabetes Mellitus	40 (32%)	40 (32%)
Heart Disease	35 (28%)	30 (24%)

ICU admission, ventilation requirement and mortality was significantly higher in general population 19 (15.2%), 24 (19.2%), 14 (11.2%) as compared to health workers 6 (4.8%), 7 (5.6%) and 5 (4%) with p value < 0.05.(Table 3)

Table 3: Comparison of outcomes among both groups

Variables	Group I	Group II
ICU admission	19 (15.2%)	6 (4.8%),
Ventilation requirement	24 (19.2%)	7 (5.6%)
Mortality	14 (11.2%)	5 (5%)

DISCUSSION

COVID-19 was a burden that every health system had to bear, and it was up to them to prevent and treat it. As the epidemic enters its third year, the health and well-being of HCWs, as well as the unmeasured number of excess deaths in HCWs attributed to COVID-19, is becoming a major concern for a variety of stakeholders. It is difficult for all countries to report the exact number of deaths caused by COVID-19, let alone those among HCWs (even those with well-functioning death registration systems). Several factors play a role, for example: Untested persons may not be included in death figures since nations have varying capacities for testing and tracking infections in and deaths of HCWs, with some only reporting deaths for which a COVID-19 test has proven that a patient was infected with SARS-CoV-2. As a result, in this case, utilizing a

population-based estimator would minimize the sensitivity to detection bias. Different COVID-19 testing methodologies, case management capacity, and age reporting protocols, as well as the conclusion not being known for all instances, are all concerns. [11] Countries may only report COVID-19 deaths that occur in hospitals or health facilities; deaths that occur elsewhere may not be documented.

In this study 250 patients infected with covid-19 were presented. Among 250 cases 125 patients was general population included in group I while other 125 cases were health workers included in group II. In group I 65 (52%) patients were males and 60 (48%) cases were females with mean age 47.66±8.87 years and in group II 70 (56%) were males and 55 (45%) females with mean age 27.66±8.87 years. Mean BMI in group I was 25.11±8.33 kg/m^2 and in group II body mass index was 22.32±7.54 kg/m^2. Majority of the patients 73 (58.4%) in group I had poor socio economic status but in group II 50 (40%) cases had poor economic status. Majority of the cases among both groups were from urban areas 75 (60%) and 85 (64%). These results were comparable to the previous some studies.[12,13] 48 (38.4%) were symptomatic in group I and 53 (42.4%) were symptomatic in group II. Hypertension, diabetes mellitus and heart disease were the most common comorbidities. According to Lai et al. (2020), psychological distress rose for workers living and working in the Wuhan region at the time of the epidemic's breakout (i.e., those allocated to COVID-19 patients). As a result, the same rule applies: the closer you are to the risk of infection, the more likely you are to suffer from acute psychological discomfort. In prior studies on emerging disease outbreaks, similar findings were discovered. During the SARS pandemic, for example, Wong et al. (2007) found increased levels of anxiety among university students, particularly among medicine students and students who lived in the area where the disease spread the most. Wheaton et al. (2012) also found that in response to the H1N1 pandemic, students had higher levels of anxiety. Anxiety arose in response to a variety of viral infections, ranging from the seasonal flu virus to the H1N1 pandemic (Coughlin, 2012).[15-17]

In current study, ICU admission, ventilation requirement and mortality was significantly higher in general population 19 (15.2%), 24 (19.2%), 14 (11.2%) as compared to health workers 6 (4.8%), 7 (5.6%) and 5 (4%) with p value < 0.05.[18,19] Peng et al. [20] discovered 40 medical staff out of 138 patients (29%) in a single-center study in Wuhan, China, whereas another retrospective review of 1099 confirmed COVID19 patients in 552 hospitals from 31 provinces in China revealed 2.09 percent [21]. HCWs made up a major number of early Covid-19 cases, which were apparently acquired in hospitals, according to early research. Deaths among HCWs, on the other hand, are uncommon and usually involve the elderly. The number of HCWs who become infected has decreased as knowledge of the disease has grown [22]. HCW who wore PPE were less likely to become infected than those who did not wear PPE, according to a recent study [23], emphasizing the relevance of universal PPE availability and use among HCW. Earlier influenza pandemics revealed low rates of infection with good PPE and that many infected HCWs were extremely young, as we found in our analysis.

We discovered that healthcare workers with Covid-19 were more likely to have an identified COVID exposure, present less acutely sick, and be admitted to the hospital when compared to adult non-healthcare workers with Covid-19 who came to the ED.

CONCLUSION

We concluded in this study that the severity of pandemic disease among general population was higher because of less use of preventive measures as compared to health workers and frequency of deaths, ICU admission and use of invasive ventilation in general population were also very high.

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