ORIGINAL ARTICLE

Clinical characteristics, outcomes, area of work, and return to work of healthcare workers with COVID-19 infection: An experience of a tertiary care renal hospital in Pakistan

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ABSTRACT

Background: The COVID-19 pandemic caused significant loss to healthcare systems across the world. Patients usually presented with fever and cough as the primary symptoms. This paper aims to discuss the clinical features, outcomes, areas of work, and duration of absence from work in employees working at a tertiary care renal hospital in Pakistan.

Material and Methods: Data of employees who were suspected of having COVID-19 was compiled and divided into waves according to the COVID-19 waves in Pakistan. The clinical characteristics and duration till return to work was calculated and compared among waves using Chi-square test.

Results: Five waves of COVID-19 were observed during the study. A total of 620 employees were tested during the waves, of which 216 (35%) tested positive. Of those who tested positive, most were healthcare workers (n=165 [76%], p-value <0.01). The most common symptom among positive cases was fever and least common was a combination of fever cough (p-value <0.01). The duration of absence from work dropped from a maximum of 43 days in the first wave to five days in the fifth wave. A total of 4763 employee days were lost during the pandemic.

Conclusion: Strict implication of safety protocols in the workplace followed by astute management strategies must be maintained. Now that the pandemic is nearly over, strategies to mitigate outbreaks in the hospital should be limited to screening employees with fever and cough to preserve resources and reduce employees' absence from work.

Keywords: COVID-19, healthcare workers, absence of employees, fever and cough, Duration of absence

BACKGROUND

Coronaviruses can cause a variety of acute and chronic diseases. Common signs of a person infected with a coronavirus include respiratory symptoms, fever, cough, shortness of breath, and dyspnea. In severe cases, the infection can cause pneumonia, severe acute respiratory syndrome (SARS), kidney failure, and even death. In 2019 a novel coronavirus, SARS-CoV-2, was discovered in a cluster of pneumonia cases in Wuhan, China and was called Corona Virus Disease of 2019 (COVID-19). It started spreading worldwide and COVID-19 was declared a pandemic on March 11, 2020, by the World Health Organization (WHO). It inevitably reached Pakistan in March 2020. Our first cases came from pilgrims returning from Iran, and as it was apparent that the disease would spread to the general public, the government decided to impose a lockdown in the country as soon as the first case of lateral spread was confirmed.[1] The implication of strict control was achieved via the government's robust efforts, which involved measures like fines on not wearing a mask in public, pillion riding, more than two persons traveling in a car, and many other restrictive measures.

The Kidney Centre Post Graduate Training Institute, a tertiary care renal hospital, immediately took steps to cater to the pandemic. We encountered the first employee suspected of having COVID-19 at the end of April and the first employee confirmed of having

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COVID-19 was at the beginning of May 2020. A formal plan to prevent the transmission of SARS CoV-2 at our center was made and updated regularly according to the changing scenario of COVID-19 in the region. The plan conformed to local and international guidelines.[6-8] A major problem seen worldwide was healthcare workers falling prey to the disease,[9] which resulted in significant problems faced by hospital administration regarding making decisions on diagnostic criteria, duration of quarantine, return to work with or without tests, and end of quarantine.

Pakistan has so far experienced five different waves of COVID-19. The nation's first wave of COVID-19 began in late May 2020, peaked in mid-June 2020 and ended in mid-July. The government announced a second spell of COVID-19 in Pakistan on October 28, 2020, when a daily increase in cases reached 750 compared to 400 to 500 in the preceding weeks.[6] The third wave of COVID-19 in Pakistan was seen in April 2021, and the fourth wave peaked in July 2021. Finally, Pakistan faced the Omicron-driven 5th peak of COVID-19 positive cases in January 2022.

This paper aims to discuss the clinical characteristics, areas of work, and duration to return of work, of employees at our center who acquired, or were suspected to be at risk of acquiring the COVID-19 infection during the current pandemic, and to compare the findings in each wave.

MATERIAL AND METHODS

This study was carried out at a tertiary care renal center from March 2020 to February 2022 after obtaining institutional approval from Ethical Review Committee vide reference number 115-IDC-122020. Since this is a retrospective study, we included all employees, and no formal calculation of sample size was done. A questionnaire was developed that contained questions regarding the history of symptoms, contact, or travel (only during March 2020).

Suspected employees visited the emergency department, where they were screened using the mentioned questionnaire. Employees who answered yes to any of the questions were either tested for SARS CoV-2 by polymerase chain reaction (PCR) or later by SARS CoV-2 rapid antigen test (RAT) and monitored for symptom development. Employees who answered "NO" to all questions mentioned in the questionnaire were not suspected of infection. Employees who remained asymptomatic, or were not exposed to any COVID infected healthcare worker during the study period were excluded from the study. Doctors, housekeeping staff, laboratory staff, nurses, paramedics, pharmacists and radiology staff were all classified as healthcare workers while administrative staff, IT department, laundry staff, security guards and telephone operators were classified as non-healthcare workers.

A sheet recording the following details apart from identification was maintained: Exposure, presence of symptoms, the decision to test or monitor for symptoms, date of the first and second test, the decision to isolate/ quarantine, and date of the end of isolation / quarantine. During the first COVID-19 wave, date of end of isolation tests, date of return to work and the names of employees exposed to a positive employee were also noted. Initially employees were asked to return to work after fifteen days if they tested negative for SARS CoV-2. Later, in March 2021, according to the recommendations of Center for Disease Control and Prevention (CDC), the period of isolation for COVID-19 confirmed cases with mild disease and no history of immunosuppression, was reduced to ten days after positive PCR test AND staying afebrile for 24 hours without antipyretic AND improvement of symptoms. Isolation was continued for 14 days after the positive PCR test and the above-mentioned criteria for those with mild disease and had any history of immune suppression.[7] Simultaneously, questions regarding newer symptoms of COVID-19, like e.g. nausea, vomiting, and diarrhea were included in the questionnaire. All employees were strongly recommended to get vaccinated against COVID-19.

Data was entered in a Microsoft Excel sheet and transferred to IBM SPSS Statistics 22. Percentages for qualitative variables and durations of quarantine in each wave were calculated in the numbers of days, and average obtained. Chi square was used to compare results of categorical variables between waves and a *p*-value of <0.05 was taken as significant.

RESULTS

Five waves were observed during the study. The duration of waves was decided according to the waves that occurred in Pakistan (Figure-I, www.covid.gov.pk). A total of 620 employees were tested during the waves,

of whom 216 (35%) tested positive (Table-I). Of those who tested positive, most were healthcare workers (n=165 (76%) (Table-I), most of whom were from the ICU team (n=40), followed by nursing staff (n=35) and dialysis staff (n=26). Anesthesia team was least commonly affected (n=5).

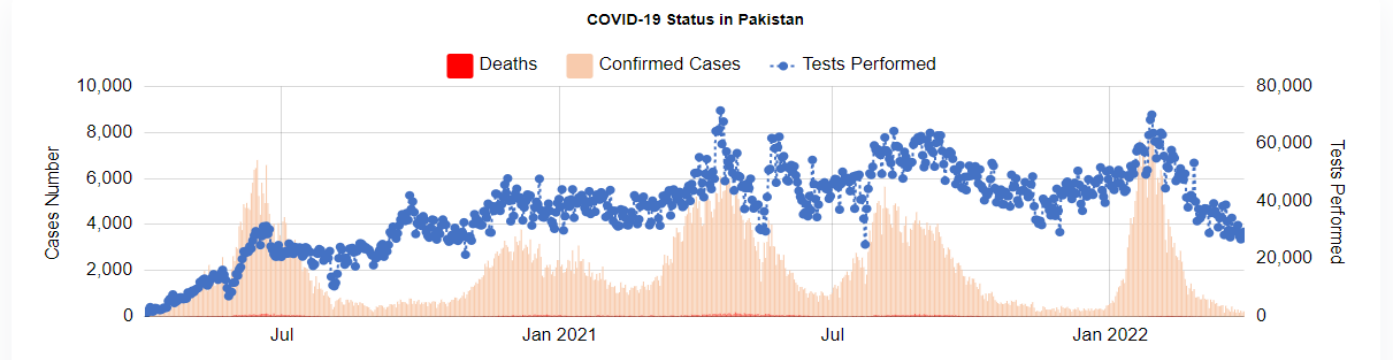
The most common symptom among positive cases was fever and least common was a combination of fever and cough (Table-II, *p* value <0.01). One affected employee (non-healthcare worker) passed away, while the rest recovered from the illness. A similar bar graph was made with the number of cases observed at our center (Figure-II).

Table-I: Comparison of COVID test of employees during the waves.

	Wave 1 (n)	Wave 2 (n)	Wave 3 (n)	Wave 4 (n)	Wave 5 (n)	*p* v
Test results						
Positive	65	40	5	45	61	<0
Negative	100	38	49	84	133	
Employee type (in positive cases)						
Non-healthcare workers	17	4	0	19	11	<0
Healthcare workers	48	36	5	26	50	

Table-II: Comparison of COVID symptoms experienced by employees during the five waves.

Symptom	Wave 1 n (%)	Wave 2 n (%)	Wave 3 n (%)	Wave 4 n (%)	Wave 5 n (%)	*p* value
Fever	35 (53.8)	24 (60.0)	3 (60.0)	25 (55.5)	36 (59.0)	
Cough	14 (21.5)	21 (52.5)	2 (40.0)	23 (51.1)	28 (45.9)	
Sore throat	5 (7.6)	13 (32.5)	2 (40.0)	25 (55.5)	48 (78.6)	<0.01
Body aches	14 (21.5)	6 (15.0)	3 (60.0)	20 (44.4)	48 (78.6)	
Fever and cough	11 (16.9)	14 (35.0)	1 (20.0)	17 (37.7)	13 (21.3)	



www.covid.gov.pk

Figure-I: Positive cases during the COVID pandemic in Pakistan- a view of the waves.

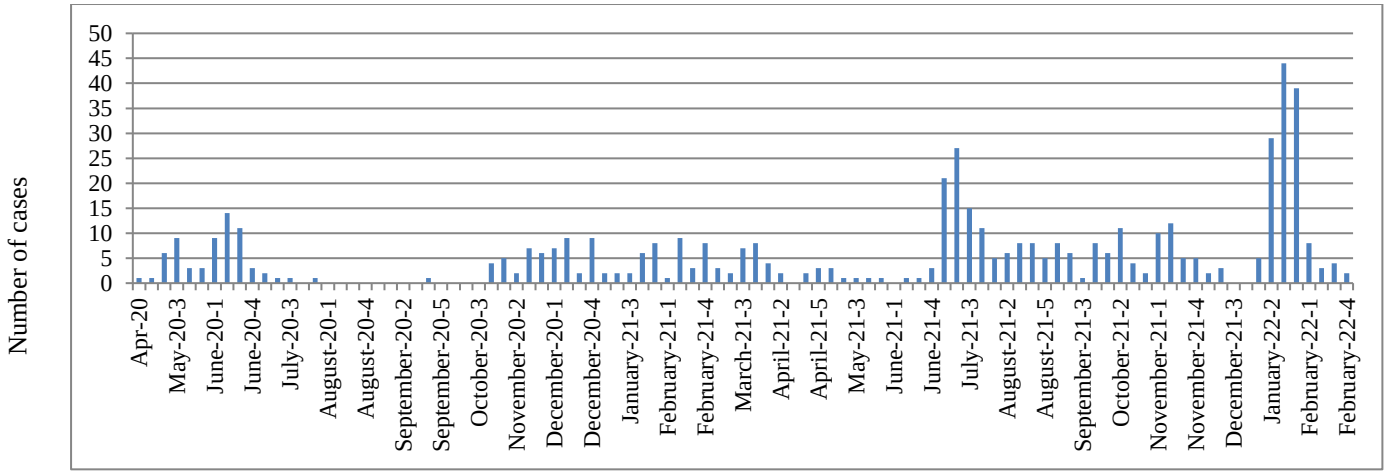


Figure-II: The number of cases observed at our center.

Timeline

DISCUSSION

The COVID-19 pandemic has wreaked havoc worldwide on health and the economy.[10, 11] The risk of exposure to COVID-19 patients has been looming over healthcare workers constantly loomed over healthcare workers, and hospital burden has increased due to the absence of exposed or affected healthcare workers worldwide.[12] Our center, too faced the same issues. The hospital has nearly 650 employees, and about 450 of these are healthcare workers. [17.1% of employees were positive for SARS-CoV-2. from May 2020 to February 2022, 495 (80%) being healthcare workers.] Across the five waves, 216 (35%) employees were positive for COVID out of the 620 total tested employees, of which 76% were healthcare workers. As a result of isolation and testing protocol, 4763 employee days were lost, imparting a considerable burden on the hospital. This burden was similarly faced by other centers throughout the world,[9] where loss of employee hours resulted in financial and work burden.[11] Analysis of the patients during all five of the COVID-19 waves at our hospital showed that healthcare workers were more often affected than non-healthcare workers.

In the initial period, when all exposed employees were screened by SARS-CoV-2 PCR regardless of symptoms, most asymptomatic employees were negative for the virus (*p*-value 0.004). Our first positive case was seen in May, and the number increased gradually with a peak in the middle of June, concurrent with the first wave statistics of Pakistan. Cases started dwindling towards the end of June with the end of the first wave in July 2020.As seen in several other studies[13,14], fever followed by cough was the most common symptom observed in our employees having COVID-19 compared with those who were PCR negative. The strategy was modified later to test only symptomatic employees or those with high-risk exposure and monitor the rest for the development of symptoms. This was done because of the negative results in asymptotic individuals and also advised by local guidelines.[7]

During the initial waves, when isolation was ended after a negative PCR test, most employees tested negative for the virus after sixteen days, the earliest negative test was ten days, and the longest negative test was 43 days. Similar findings were reported in other studies where the duration of PCR negativity after first positive test was nineteen days[15] and seventeen days [16]. Once time-based end of isolation was instituted the duration was shortened to 10 days as per guidelines during waves 3 and 4 and finally to five days during wave 5.

One of the strategies opted for was not to admit patients who were SAR CoV-2 PCR positive or had a strong suspicion of COVID-19. This was done to protect a large population of our patients who have many preexisting conditions and are immune compromised either because of their disease (diabetes, obesity, hypertension, chronic kidney disease or end stage kidney disease, etc.) or because of our treatment (kidney transplant, glomerulonephritis). For the same reason, during the first two waves any employee with significant exposure to a COVID-19 patient (more than 15 minutes and less than six feet) was asked to get tested twice by SARS CoV-2 PCR, 24 hours apart. Later, the strategy was modified to monitor symptoms, log them on a chart maintained by the employee's department heads, and get tested by SARS CoV-2 PCR twice if they were symptomatic. Until two consecutive PCR tests returned as negative, employees were asked to quarantine at home.

Since the hospital could not admit COVID-19 suspected or confirmed patients, it was hoped that most hospital staff would remain unexposed. However, we saw some mini outbreaks. The first one was in the ICU, where a doctor who was moonlighting in a COVID-19 care facility performed night shift duty with inadequate Personal Protective Equipment (as informed by other healthcare workers). Some other workers in that shift who worked in close contact became positive. Other outbreaks were seen in the finance and human resource departments, none of which linked to a positive patient as the source. Eating in groups was identified as the source in the first outbreak. Later strict measures were employed to ensure that staff did not dine together.

The likely causes of the number of cases seen in our employees were nonadherence to social distancing and masks outside the hospital and occasionally in the hospital. This behavior was seen in the public also, where denial and disbelief led to non-compliance with personal protective equipment protocols.

CONCLUSION

Employees' adherence to social distancing and personal protective equipment inside and outside the hospital can

lead to less exposure to the pandemic and consequently reduce lost employee days for hospitals and other organizations. Strict implications of safety protocols in the workplace made effective by astute management strategies must be maintained. Now that the pandemic is nearly over, strategies to mitigate outbreaks in the hospital should be limited to screening employees with fever and cough to preserve resources and reduce employees' absence from work.

CONFLICT OF INTEREST

None

GRANT SUPPORT & FINANCIAL DISCLOSURE

Declared none

AUTHOR CONTRIBUTION

Fizza Farooqui: Main conception of the study, study design, data collection, data analysis, manuscript writing, final approval, agreement to be accountable for all aspects of the work

Safia Qureshi: Data collection, data analysis, manuscript writing, final approval, agreement to be accountable for all aspects of the work

Aasim Ahmad: Study design, manuscript writing, final approval, agreement to be accountable for all aspects of the work

Saeed Chishty: Study design, manuscript writing, final approval, agreement to be accountable for all aspects of the work

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