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ORIGINAL ARTICLE

Vaccination Status of Hospitalized Patients with Covid-19 Infection during 4th Wave in Tertiary Care Hospital of Pakistan

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ABSTRACT

Background: The first COVID-19 vaccination was developed in December 2020. Effectiveness of different vaccines to prevent symptomatic COVID infection varies from 50% to 95% while effectiveness at preventing the critical disease and death ranges between 79 to 100%.
Aim: To see vaccination status of hospitalized patients with COVID infection and to compare severity & mortality among vaccinated and non-vaccinated patients during 4th wave of COVID-19.
Methods: This cross-sectional study was conducted in the Department of Pulmonology Shaikh Zayed Hospital, Lahore. The duration of study was 4 months from 01-07-2021 to 31-10-2021.
Results: Total 121 patients having ages between 28 and 85 years; there were 77(63.6%) males & 44 (36.4%) females.Twenty four (20%) study participants were fully vaccinated, 14% were partially vaccinated and 66% of patients were not vaccinated. Most of the fully vaccinated patents had mild disease (58.3%), while, non-vaccinated patients either had severe disease (57.5%) or they were in critical condition (22.5%). All deaths in our study were recorded in non-vaccinated patients (28.8%).
Conclusion: We concluded that patients who are fully vaccinated have less severe disease and low mortality rate as compared to non-vaccinated patients.
Keywords: COVID-19, Vaccination

INTRODUCTION

The ongoing corona virus pandemic is major global threat, especially for the developing counties[1,2]. According to a systemic review out of fifty three thousand hospitalized patients with COVID-19 infection, 20.2% had severe disease with mortality rate of ~3.1%[3]. The elderly people and patients with comorbidities have significantly high mortality[4,5]. There are several drugs which have been used to treat the severe COVID-19 infection, but initially there was no specific treatment approved by the US Food and Drug Administration (FDA) and WHO[1]. Vaccination of the whole population is one of the promising strategies in this crisis[1].

After identification of SARS-CoV-2 virus as a causative agent for COVID-19 infection, vaccine development was started in various research centers[6]. In December 2020 1st mass level vaccination program was started[7]. COVID vaccination campaign in Pakistan was started in February 2021, and till October 2021 about 105 million doses has been administered[8]. Most of the population received Chinese vaccines Sinopharm and Sinovac but some individuals received AstraZeneca, Pfizer and Moderna COVID vaccine as well[8]. Pakistani population like many other developing countries has different myths about the use of vaccines, however according to one study 70% of Pakistani population was willing to get COVID vaccination[9].

Effectiveness of different vaccines to prevent symptomatic COVID infection varies from 50% to 95% while effectiveness at preventing the critical disease and death ranges between 79 to 100%.[7] Forth wave of COVID-19 infection in Pakistan was started in July 2021. Current study has been designed to see vaccination status of hospitalized patients with COVID infection and to compare severity & mortality among vaccinated and non-vaccinated patients.

MATERIALS & METHODS

After IRB permission, this cross-sectional study was conducted in the Department of Pulmonology Shaikh Zayed hospital, Lahore. The duration of current study was 4 months from 01-07-2021 to 31-10-2021. One hundred twenty one (121) COVID-19 patients diagnosed on the basis of RT PCR and admitted to isolation ward at Shaikh Zayed hospital, Lahore were included. Written informed consent was taken from the study participants. The data were recorded in SPSS 20.0. Data were described by using frequencies and percentages and presented in tables, and pi-chart.

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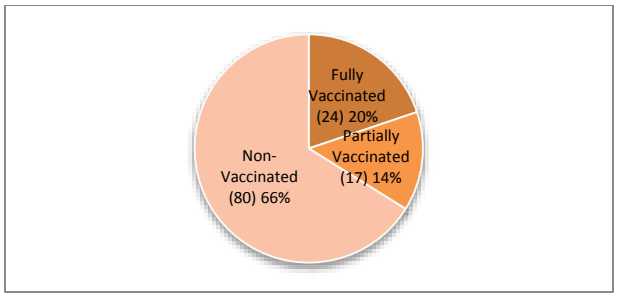
RESULTS

The total number of patients registered in the study was 121, having ages between 28 and 85 years; there were 77(63.6%) males & 44(36.4%) females. Twenty (16.5%) patients had mild disease, 19% had moderate disease, 49.6% severe while 14.9% patients were critical. Ninety eight (81%) patients discharged home after recovery. Twenty four (20%) study participants were fully vaccinated, 14% were partially vaccinated and 66% of patients were not vaccinated. Most of the fully vaccinated patents had mild disease (58.3%). There was no mortality recorded among partially vaccinated & fully vaccinated patients. Duration of acquiring infection after completion of vaccination ranged between 4 to 34 weeks (15.3±9.0).

Table 1: Various characteristics of patients

		n	%
Gender	Male	77	63.6
	Female	44	36.4
Disease Severity	Mild	20	16.5
	Moderate	23	19.0
	Severe	60	49.6
	Critical	18	14.9
Outcome	Discharged with recovery	98	81.0
	Death	23	19.0
Age		58.5±14.1 (28.0 – 85.0)	
Duration of acquiring infection after vaccination		15.3±9.0 (4.0 – 34.0)	

Figure 1: Vaccination status



Most of the non-vaccinated patients either had severe disease (57.5%) or they were in critical condition (22.5%). All deaths in our study were recorded in non-vaccinated patients (28.8%).

Table 2: Disease severity and outcome in fully vaccinated, partially vaccinated & non-vaccinated patients

		Fully Vaccinated		Partially Vaccinated		Non-Vaccinated	
		n	%	n	%	n	%
Gender	Male	17	70.8	13	76.5	47	58.8
	Female	7	29.2	4	23.5	33	41.2
Disease Severity	Mild	14	58.3	3	17.6	3	3.8
	Moderate	7	29.2	3	17.6	13	16.2
	Severe	3	12.5	11	64.7	46	57.5
	Critical	0	0.0	0	0.0	18	22.5
Outcome	Discharged with recovery	24	100.0	17	100.0	57	71.2
	Death	0	0.0	0	0.0	23	28.8
Age		53.9±12.6 (30.0 – 75.0)		57.6±10.3 (38.0 – 73.0)		60.2±28 (28.0 – 85.0)	
Duration of acquiring infection after vaccination		15.3±9 (4.0 – 34.0)					

DISCUSSION

The development of vaccines against COVID-19 was started soon after the SARS-CoV-2 genetic sequence data was shared through GISAID (Global Initiative on Sharing Avian Influenza Data), and by March 2020, the global pharmaceutical industry announced a major commitment to address COVID‑19. The first COVID-19 vaccination was developed in December 2020, and it was made available to the public through emergency authorizations and conditional approvals. Different types of vaccines against COVID-19 are available. In the western countries the COVID-19 vaccination campaign was started earlier then the developing countries. In Pakistan vaccination was started in February 2021 with Chinese vaccines which contain inactivated corona virus, later on other vaccines like mRNA vaccines and adenovirus vector vaccines were also included in COVID vaccination program.

In our study we found that most the patients admitted to the hospital during 4th wave of covid-19 were non-vaccinated. These non-vaccinated patients had more severe disease and high mortality as compared to fully vaccinated patients.

In a study conducted in United States it was found that being fully vaccinated against COVID-19 was associated with lower mortality and lower rates of hospitalization.[10] In another study by Rossman H et al it was observed that number of hospitalization due COVID-19 infection has been decreased in vaccinated individuals[11]. The results of these studies are comparable with our study where we found that majority of patients hospitalized with COVID-19 were non-vaccinated (66%) and most of these patients had severe disease whereas vaccinated patients had mild disease.

In this study we observed that all vaccinated patients were fully recovered and discharged from hospital, whereas mortalities were reported in 19% patients and all of these patients were non-vaccinated. A study conducted in Europe and Israel demonstrated a strong effectiveness of COVID-19 vaccination in terms of protection against deaths[12].

If talk about the limitations our study has few limitations. It is a single center study that's why it might not represent the whole country population despite the fact that Shaikh Zayed hospital is one the largest referral tertiary care center of Lahore. The other limitation of this study is relatively small sample size, reasons being single institutional study and perhaps relatively limited time frame in which study was conducted.

CONCLUSION

We concluded that patients who are fully vaccinated have less severe disease and low mortality rate as compared to non-vaccinated patients.

Contributions of Authors: MS: From inception to final publication, **TM:** Supervision throughout the study, final shaping, **RA:** Data collection, Proof reading, **MA:** Data collection

Conflict of interest: No conflict of interest to disclose

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