

To Assess the Clinical Pattern of COVID-19 among the Vaccinated People

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Abstract

Background: Since the World Health Organisation has declared COVID-19 a pandemic on 11 March 2020, it has become a significant health concern at an alarming rate. There have been tremendous efforts by the countries to provide adequate care to the people affected by SARS-CoV-2. India is running one of the world's largest vaccination programmes. COVID-19 vaccines are designed to prompt an immune response that, recognises and blocks the virus. However people with comorbidities who have a weakened immune response may still be at risk even after vaccination.

Aim: The aim of our study is to assess clinical pattern of disease among vaccinated COVID-19 patients and to find the correlation between comorbidities and the severity of disease outcome in post vaccinated COVID-19 patients.

Materials and method: A descriptive cross sectional study was done taking COVID-19 patients from GANDHI Hospital, Secunderabad admitted during the months of May to August 2021. Gandhi Hospital is a territory care facility which has been the heart of pandemic management. On a random basis 1000 COVID-19 patients were taken, out of which 99 were vaccinated either with single or both doses. The data was collected via telecommunication using a semi structural standardised pro forma and the responses were noted. The data was entered in a MS Excel sheet and analysed using IBM SPSS statistics.

Results: In our study the association between comorbidity and outcome was found to be statistically significant ($p=0.028$). Out of the 61 patients with comorbidities 35(57.4%) fully recovered, 16(26.2%) partially recovered and 10(16.4%) died. We have found that post vaccinated COVID-19 patients with comorbidities have longer hospital stay probability (61.6%) and oxygen requirement (65.6%).

Conclusion: Our study showed that among the breakthrough infections, the risk of mortality is approximately 8 times more in patients with comorbidities. This shows that COVID-19 is still possible even after vaccination are hitting people with one or more comorbidities particularly hard.

Keywords: COVID-19; Clinical pattern; Vaccination; People

Introduction

Since the World Health Organization has declared COVID-19 a pandemic on 11 March 2020, 1,181,007,816 cases and 3,927,222 deaths were recorded as of June 29 2021. It has become a significant health concern among humans of all age groups and genders at an alarming rate. The people who were infected with SARS-CoV-2 presented with symptoms ranging from fever, dry cough, fatigue, loss of smell and taste, diarrhea, headache, and muscle pain to severe outcomes like pneumonia, ARDS, MI, chronic kidney disease, etc. and even death. It takes 5-6 days for the symptoms to appear.

There have been tremendous efforts by the countries to provide adequate care to the people affected by SARS-

CoV-2. So many of the non-healthcare facilities have been converted into hospitals and intensive care units. The second wave of COVID-19 has gravely struck India and is challenging the government of India to implement a mass vaccination drive [1].

India is running one of the world's largest vaccination programs which took place in four phases. Initially, healthcare workers, people older than 60 years, and people 45+ with comorbidity were given preference. Later all people above 18 years were vaccinated.

India has administered 329,029,510 doses overall, including first and second doses of the approved vaccines, as of 28 June 2021. The two vaccines which have been approved for emergency use in India are Covishield and Covaxin. COVID-19 vaccines are designed to prompt an immune response that, recognizes and blocks the virus. However, people with co-

morbidities who have a weakened immune response may still be at risk even after vaccination.

Our study assessed the clinical pattern of COVID-19 disease among the vaccinated people considering the local population of Telangana. There is also some misconception among the people that COVID-19 infection after vaccination is not possible. This study depicts the importance of taking safety precautions even after vaccination. This study will also help educate the public, dispel misinformation and reduce vaccine hesitancy. It will also help assess the rate of COVID-19 infectivity even after vaccination.

Aim

Our study aims to assess clinical patterns of disease among vaccinated COVID-19 patients and to find the correlation between comorbidities and the severity of disease outcomes in post-vaccinated COVID-19 patients.

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Methodology

Study design

A descriptive cross-sectional study will be done taking COVID-19 patients from GANDHI hospital during May to December of 2021. The data will be collected via telecommunication and responses will be noted. The required data will be collected using a semi-structural standardized pro forma.

Sample size

COVID-19 patients admitted to GANDHI hospital during the month of May to December of 2021 and were willing to participate in the study.

Inclusion criteria

Post-vaccination COVID-19 patients admitted to GANDHI Hospital Hyderabad.

Exclusion criteria

Not vaccinated COVID-19 patients.

Data analysis

Data were entered in an MS excel sheet and were analyzed using IBM SPSS statistics.

Results

Demographic data

Distribution of study subjects based on gender: Among the 990 patients involved in study 650(66%) are male and 340(34%) are female.

Distribution of patients based on age: Of the 990 patients 550(56%) are below 60 years and 440(44%) are 60 and above years.

Clinical pattern assessment

Association between sex and outcome: Table 1

Gender	Fully recovered	Partially recovered	Death	Total
Female	230(67.6%)	90(26.5%)	20(5.9%)	340
Male	390(60%)	170(26.2%)	90(13.8%)	650
Total	620(62.6%)	260(26.3%)	110(11.3%)	990
P=0.621				

Table 1: Association between sex and outcome

Association between age and outcome: Around 360(65.5%) were fully recovered, 100(18.2%) were partially recovered and 40(7.3%) died belonging to the age group 18-59. Around 260(59.1%) were fully recovered, 90 (20.5%) were partially recovered, and 70(15.9%) died belonging to the age group 60 and above. P=0.46.

Association between comorbidity and outcome: Only 350(57.4%) out of 61 people with comorbidity fully recovered, while 160(26.2%) partially recovered and 100(16.4%) died (Table 2). The association between comorbidity and outcome was found to be statistically significant ($p < 0.05$).

Comorbidity	Fully Recovered	Partially Recovered	Death	Total
No	270(71.1%)	100(26.3%)	10(2.6%)	380
Yes	350(57.4%)	160(26.2%)	100(16.4%)	610

Total	620(62.6%)	260(26.2%)	110(11.1)	990
P=0.028				

Table 2: Association between comorbidity and outcome

Association between comorbidities and oxygen requirement: Out of the 610 comorbid patients, 360(65.6%) needed oxygen while the remaining 250 (56.8%) did not require it. Among the 380 patients without comorbidities, 190(34.5%) patients needed oxygen while the remaining 190(43.2%) did not require it (P=0.38).

Association between comorbidity and duration of hospital stay: Table 3

Hospital stay	Without comorbidities	With comorbidities	Total	Total
Less than 15 days	290(36.7%)	500(63.2%)	790	380
15 days and above	90(45%)	110(55%)	200	610
Total	380(38.4%)	610(61.6%)	990	990
P=0.076				

Table 3: Association between comorbidity and duration of hospital stay

Discussion

The following study is a descriptive cross-sectional study taking COVID-19 patients from Gandhi Hospital, Secunderabad admitted from May to August 2021. On a random basis 10000 COVID-19 patients were taken, out of which 990 were vaccinated either with single or both doses. In the state of Telangana, Gandhi Hospital, a tertiary care facility has remained at the heart of pandemic management.

In our study 74% received Covishield and 26% received Covaxin. The mean age group in our study is 55.38 ranging from 18-80 years of which most were male [2,3]. 24% of the people were below 45 years and the remaining were more than 45 years in this study. According to the Indian Council of Medical Research (ICMR) of the 9.3 million who received the first dose of Covaxin, 4208 tested positive; and of the 1.7 million who received the second dose, 695 tested positive (0.04%). For Covishield, of the 100.3 million who received the first dose, 17,145 tested positive; and of the 15 million who got the second dose, 5,014 tested positive (0.02%) [4].

A study done regarding the effectiveness of COVID-19 vaccines in in-patient care settings reports the effectiveness of mRNA vaccination was 89% against laboratory confirmed infections leading to hospitalization [5]. A study by Michela Antonelli, et al. reports that vaccination was associated with reduced odds of hospitalization following the first or second dose. Almost all the symptoms were reported less frequently in infected vaccinated people than in infected unvaccinated people [6].

A study on the association of sex and age with mortality in COVID-19 patients states that male patients when compared with females were associated with a significantly increased risk of mortality ($p < 0.00001$). Mortality was 15.4 folds increased in patients with age > 50 years when compared to those who were < 50 yrs [7]. A study by Md. Abdul, et al. found that male patients and elderly patients (age > 50 years) are at a higher risk of developing severe disease [8]. Another study on the Risk production of COVID-19 death and hospital admission after vaccination stated that the mortality incidence increased with age and male sex [9].

A study on the Association of comorbidities with mortality in COVID-19 patients described that comorbidities increased risk of mortality; kidney disease ($p < 0.00001$), cerebrovascular disease ($p < 0.00001$), cardiovascular disease ($p < 0.00001$), respiratory disease ($p < 0.00001$), diabetes ($p < 0.00001$), hypertension ($p < 0.00001$), and cancer ($p = 0.002$) but not liver disease ($p = 0.16$). A study in the US describing the impact of vaccination on COVID-19 outbreaks suggests that a vaccine could have a substantial impact on reducing hospitalization and deaths, especially among individuals with comorbidities. A study in the US describing the impact of vaccination on COVID-19 outbreaks suggest that a vaccine could have a substantial impact on reducing hospitalization and deaths, especially among individuals with comorbidities [10]. A study by Julia Hippisley-Cox, et al. stated that the mortality incidence increased with comorbidities [9]. A study on comorbidity and its impact on COVID-19 states that patients with comorbidities have more deteriorating outcomes. COVID-19 patients with a history of hypertension, obesity, chronic lung disease, diabetes, and cardiovascular disease have the worst prognosis [10]. In a study by Eman, Enas, and Alia, Ehab Patients with comorbidities had significantly worse laboratory parameters. ICU admission was higher in patients with comorbidities (35.8%) [11].

In a study done by Adeel A, Hannah, Hiram a nonsignificant ($p = 0.009$) association between comorbidities and death among people with breakthrough infection is seen [12]. A study done in Korea on the preventive effect of the vaccine in presence of comorbidities showed that the difference was not statistically significant [13].

Conclusion

In our study, we have found that post-vaccinated COVID-19 patients with comorbidities have severe outcomes and have a longer hospital stay probability (61.6%) with greater oxygen requirement (65.6%). Our study showed that among the breakthrough infections, the risk of mortality is approximately 8 times more in patients with comorbidities when compared to those without comorbidities. This shows that COVID-19 is still possible even after vaccination is hitting people with one or more comorbidities like hypertension, diabetes, asthma, thyroid, heart problems, kidney problems, paralysis, etc. particularly hard which sharpens the picture of those who remain at risk despite vaccinations. Hence, it is crucial for everyone to take appropriate precautions to prevent SARS-CoV-2 infection, especially those with comorbidities.

Conflict of Interest

None of the authors have a conflict of interest.

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