

How to Cite:

Srivastava, V., Banerjee, A., Singh, H., & Gupta, S. K. (2022). A retrospective study of mortality benefit provided by single dose COVID vaccine at society level during second wave of COVID at a zonal hospital. *International Journal of Health Sciences*, 6(S3), 823–828. <https://doi.org/10.53730/ijhs.v6nS3.5507>

A Retrospective Study of Mortality Benefit Provided by Single Dose COVID Vaccine at Society Level During Second Wave of COVID at a Zonal Hospital

Vikas Srivastava

Consultant Anesthesiology and Critical Care, 167 Military Hospital, Pathankot, India

Ahijit Banerjee

Assistant Professor, Department of Anesthesiology, 167 Military Hospital, Pathankot, India

Harjot Singh

Assistant Professor, Department of Anesthesiology, 167 Military Hospital, Pathankot, India

Sanjaya Kumar Gupta

Associate Professor, Department of Anesthesiology, 167 Military Hospital, Pathankot, India

Abstract---Since December 2019, the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) pandemic has caused high morbidity and mortality, with new variants rapidly spreading. Vaccines to prevent corona virus disease 2019 (Covid-19) have been developed with unprecedented speed. An open, real-time, retrospective observational study was conducted at 167 Military Hospital, Pathankot. Data was available for 490 Covid 19 patients. The population of interest was 18-87 years old patients who were treated for moderate to severe covid pneumonia irrespective of the vaccination status. Vaccination history was documented on admission. We also documented awareness regarding the name of covid-19 vaccine administered to the patients admitted in this hospital. Between 08 Dec 2020, and 20 Jun 2021, 490 patients aged 18 years and older were treated for moderate to severe covid pneumonia. Out of these 490 patients, 132 patients had received first dose of covid-19 vaccine 14 days prior to onset of symptoms. Mortality happened in 55 patients out of which seven patients had received vaccine ($p < 0.05$). Overall,

there is very poor awareness regarding the type of covid-19 vaccine being administered to the patients. In conclusion, our findings from this study is that mortality or death rate is less observed in vaccinated patients when compared with unvaccinated patients. Older people, those with greater numbers of long-term conditions, people admitted to hospital in the recent weeks before their vaccination, people in high-risk occupations, care home residents, those from deprived backgrounds, men, and ex-smokers at the highest risk. By contrast, previous infection with COVID-19 was associated with a reduced risk of these events following vaccination. Overall, the rate of severe COVID-19 outcomes for individuals from 14 days onwards after a first dose of vaccine was very low, with less than 0.05% of people who received at least one vaccine suffering an adverse breakthrough event. None of the patients knew which vaccine they were administered, and neither had vaccine certificates also. We must emphasize the importance Covid 19 vaccines among Indian population.

Keywords---SARS-CoV-2, COVID-19, vaccine, severe acute, respiratory syndrome.

Introduction

Since December 2019, the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) pandemic has caused high morbidity and mortality, with new variants rapidly spreading. Vaccines to prevent corona virus disease 2019 (Covid-19) have been developed with unprecedented speed¹. The Oxford–AstraZeneca COVID-19 vaccine, code named AZD1222, and sold under the brand names Covishield and Vaxzevria among others, is a viral vector vaccine for prevention of COVID-19. Developed in the United Kingdom by the Oxford University and British-Swedish company AstraZeneca, using as a vector the modified chimpanzee adenovirus ChAdOx1.² The vaccine is given by intramuscular injection. Studies carried out in 2020 showed that the efficacy of the vaccine is 76.0% at preventing symptomatic COVID-19 beginning at 22 days following the first dose, and 81.3% after the second dose.³ A study in Scotland found that, for symptomatic COVID-19 infection after the second dose, the vaccine is 81% effective against the Alpha variant (lineage B.1.1.7), and 61% against the Delta variant (lineage B.1.617.2).⁴

Even with highly effective vaccines, some vaccinated individuals will still become infected with SARS-CoV-2 and develop severe COVID-19.⁵ It is important to understand the frequency of such severe COVID-19 outcomes and identify who is at the greatest risk to inform clinical practice, public health strategy, and evolving vaccination policy. We sought to estimate the frequency of COVID-19 admissions to hospital or deaths 14 days or more after receiving the first vaccine dose and to characterize individuals with these outcomes in terms of demographic and clinical considerations.⁶

Primary objective

To study the mortality benefit provided by single dose of Covid - 19 vaccine during second wave of SARS-COV-2 in a zonal hospital.

Secondary objective

To study the awareness regarding covid-19 vaccine among patients admitted to this hospital.

Materials and Methods

Study design

A retrospective study

Study Site

167 Military Hospital, Pathankot.

Study duration

January 2021 to June 2021 (6 months).

An open, real-time, retrospective observational study was conducted at 167 Military Hospital, Pathankot. Data was available for 490 COVID 19 patients. The population of interest was 18-87 years old patients who were treated for moderate to severe COVID-19 pneumonia in this hospital. Vaccination history was documented on admission. We also documented awareness regarding the name of COVID-19 vaccine administered to the patients admitted in this hospital. In this we are going to study gender distribution, vaccination status of the patients, mortality rate. Vaccination information was available on individuals vaccinated in general practices directly from patient records.

Results

Between 08 Dec 2020 and 20 Jun 2021, 490 patients aged 18 years and older were treated for moderate to severe covid pneumonia. Out of these 490 patients, 132 patients had received first dose of COVID-19 vaccine 14 days prior to onset of symptoms. Overall, there is very poor awareness regarding the type of covid-19 vaccine being administered to the patients

Table 1
Vaccination status of COVID 19 patients

Vaccination status	Male	Female
Vaccinated	93	39
Not vaccinated	185	173
Total	278	212

Out of 490 patients, 278 (56.73%) were males, 212 (43.26%) were females. In males, 93 were vaccinated, 185 patients were not vaccinated. In females, 39 were vaccinated, 173 were not vaccinated.

Table 2
Patient demographics

S.No	Parameter	Total Vaccination patients	Non vaccinated Patients
1	Overall	132 (26.93%)	358 (73.06%)
2	Sex Male Female	93(18.97%) 39(7.95%)	185(37.75%) 173(35.30%)
3	Age, in years 18-64 65-79 ≥80	38(7.75%) 65(13.26%) 29(5.91%)	47(9.59%) 161(84.21%) 150 (30.61%)
4	Previous History of Covid-19 No Yes	116(23.67%) 16(3.26%)	170(34.69%) 188(38.36%)

Table 3
Mortality

S.No	Number of patients died	Percentage
1	55	11.22

Table 4
Survived Patients

		Yes	No	P value
Vaccination of 1 st dose	Yes	125	7	0.001
	No	310	48	0.002
	Total	435	55	

In our study, 55 patients died due to covid-19, out of which 7 patients were administered vaccine and remaining 48 patients were unvaccinated ($p < 0.05$).

Discussion

We found a low risk of COVID-19 hospitalizations or deaths 14 days or more after the first vaccination dose, with less than 0.05% of individuals receiving at least one vaccination having a subsequent breakthrough event.⁷ Older people, those with underlying long-term conditions, those with a recent hospital admission before vaccination, those with a high-risk occupation, care home residents, men,

those with high socioeconomic deprivation, and ex-smokers had a greater risk of COVID-19 hospitalization or death.⁸ With the exception of being an ex-smoker, these factors are known to be associated with an increased risk of severe COVID-19 in the unvaccinated population. By contrast, previous COVID-19 was associated with a reduced risk of a serious COVID-19 outcome after the first vaccine dose.

The rate of hospitalization or death for COVID-19 related illness during the study period was 4.6 events per 1000 person-years (23 events in total). Over the same period, we calculated the rate of hospitalization or death from COVID-19 as 8.57 events per 1000 person-years (41 events in total) in the unvaccinated population in our area, despite the fact that this unvaccinated group was a much younger population who had assessed to be at a substantially lower risk of severe COVID-19 outcomes.⁹

We excluded events that occurred less than 14 days after vaccination to allow time for the vaccine to trigger an immune response; it is unclear whether the available vaccines confer protection during this initial two week period. Some severe COVID-19 events seen in the initial period after vaccination might also have occurred in those with infection before vaccination. The rate of events during this period was 6.73 per 1000 person-years.¹⁰

Conclusion

In conclusion, our findings from this study is that mortality or death rate is less observed in vaccinated patients when compared with unvaccinated patients. Older people, those with greater numbers of long-term conditions, people admitted to hospital in the recent weeks before their vaccination, people in high-risk occupations, care home residents, those from deprived backgrounds, men, and ex-smokers at the highest risk. By contrast, previous infection with COVID-19 was associated with a reduced risk of these events following vaccination. Overall, the rate of severe COVID-19 outcomes for individuals from 14 days onwards after a first dose of covishield or covaxin was very low, with less than 0.05% of people who received at least one vaccine suffering an adverse breakthrough event. None of the patients knew which vaccine they were administered, and neither had vaccine certificates also. We must emphasize the importance Covid 19 vaccines among Indian population.

References

1. Benchimol EI, Smeeth L, Guttman A, et al. The Reporting of studies Conducted using Observational Routinely-collected health Data (RECORD) statement. *PLoS Med* 2015; 12: e1001885.
2. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Lancet* 2007; 370: 1453–57.
3. GOV.UK. Joint Committee on Vaccination and Immunisation: advice on priority groups for COVID-19 vaccination, 30 December 2020.

4. Forni G, Mantovani A, Forni G, et al. COVID-19 vaccines: where we stand and challenges ahead. *Cell Death Differ* 2021; 28: 626–39.
5. GOV.UK. ISARIC4C and CO-CIN: hospitalised vaccinated patients during the second wave—update April 2021, 22 April 2021.
6. Dagan N, Barda N, Kepten E, et al. BNT162b2 mRNA Covid-19 vaccine in a nationwide mass vaccination setting. *N Engl J Med* 2021; 384: 1412–23.
7. Ioannou GN, Locke E, Green P, et al. Risk factors for hospitalization, mechanical ventilation, or death among 10 131 US veterans with SARS-CoV-2 infection. *JAMA Netw Open* 2020; 3: e2022310.
8. Angyal A, Longet S, Moore S, et al. T-cell and antibody responses to first BNT162b2 vaccine dose in previously SARS-CoV-2-infected and infection-naïve UK healthcare workers: a multicentre, retrospective, observational cohort study. SSRN 2021; published online March 25. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3812375 (preprint).
9. Krammer F, Srivastava K, Alshammary H, et al. Antibody responses in seropositive persons after a single dose of SARS-CoV-2 mRNA vaccine. *N Engl J Med* 2021; 384: 1372–74.
10. Gobbi F, Buonfrate D, Moro L, et al. Antibody response to the BNT162b2 mRNA COVID-19 vaccine in subjects with prior SARS-CoV-2 infection. *Viruses* 2021; 13: 422. reprint).