



## Research Correspondence

### **Incidence of COVID-19 among individuals vaccinated with ChAdOx1 nCoV-19 vaccine (recombinant) against SARS-CoV-2 at a tertiary health care centre in Telangana**

Sir,

The pandemic of COVID-19 caused by SARS-CoV-2, has affected more than 180 countries. As of December 19, 2021, over 273 million cases and over 5.3 million deaths have been reported globally<sup>1,2</sup>. An effective vaccine is required which can produce appropriate immune response, reduce burden on health care and consequently help to stabilize overall situation. Hence, worldwide many candidate vaccines have come up in a short period<sup>3,4</sup>.

The present study was undertaken to study incidence and risk factors of COVID-19, among individuals vaccinated with ChAdOx1 nCoV-19 vaccine (Covishield) at a tertiary care centre in Telangana, India. Institutional Ethics Committee (IEC) permission was obtained, and written informed consent was taken from all study participants. Retrospective observational single-centre follow up study was carried out at Malla Reddy Hospital, Hyderabad, Telangana. All consenting beneficiaries were included in the study. Beneficiaries were mostly general population (age 45 yr or more as per Government vaccination policy prevailing during this period of study) and a few healthcare workers (HCWs). Individuals with age more than 18 yr of either gender and those completed two doses of vaccine were included.

Data were accessed from immunization register. Individuals were followed retrospectively from their first dose (first dose of first person as per records was January 20, 2021) from records or if they had taken first dose elsewhere, then asking them date of first dose and in present followed for occurrence of disease till May 26, 2021.

All were contacted over phone from May 21-26, 2021. They were asked if they developed COVID-19

after vaccination. If answer was no, they were acknowledged and no further questions were asked. If answer was yes, they were asked about severity of the disease. Severity was assessed by the requirement of hospital admission. In case they were at home (upper respiratory tract symptoms &/or fever without shortness of breath or hypoxia), it was taken as mild disease. If they were admitted and required oxygen therapy, it was classified as moderate disease, and in case they were admitted to intensive care unit and required ventilator, it was classified as severe disease<sup>5</sup>. The date of occurrence of disease was inquired and they were requested to share reverse transcription (RT)-PCR report digitally to verify date of occurrence of disease and positivity.

Proportions, mean, standard deviation, risk ratio with 95 per cent confidence intervals (95% CI) were calculated using Open Source Epidemiologic Statistics for Public Health (OpenEpi) version 3.01<sup>6</sup>.

A total of 1135 individuals completed two doses of vaccine. Of them, 139 (12.2%) did not respond due to various reasons and the remaining 996 individuals were included in the analysis. Non-responders were compared with responders with respect to age and sex to see the impact of non-response. The mean age was 59.26±14.42 yr for responders compared to 59.86±14.12 yr for non-responders. With respect to sex, both groups were found to be comparable. The mean follow up period after the first dose was 76.26±8.48 days and it was 36.93±9.58 days after the second dose. The mean duration between two doses was 39.33±6.77 days (range 23-93 days).

Cumulative incidence (after completion of two weeks from the second dose) was 1.6 per cent (95% CI = 0.95-2.54) at mean follow up period of 36.93±9.58

**Table.** Incidence and associated factors of COVID-19 among the vaccinated individuals (n=996)

Variable	n	Cumulative incidence (95% CI)	
Total found positive for COVID-19	25	2.5 (1.667-3.629)	
Positive for COVID-19 after first dose of vaccine	2	0.2 (0.03334-0.6618)	
Positive for COVID-19 within first week of second dose	3	0.3 (0.07677-0.8173)	
Positive for COVID-19 within one to two weeks of second dose	4	0.4 (0.1275-0.9658)	
Positive for COVID-19 after two weeks of second dose	16	1.6 (0.9534-2.541)	
Variable	Positive for COVID-19	Negative for COVID-19	RR (95% CI) and P value
Healthcare workers (%)	6 (7.2)	77 (92.8)	RR=6.53 (2.44-17.53) P<0.001
Age (yr)	49±14.55	59.53±14.42	P<0.001
Duration between two doses (days)	39.68±6.81	39.32±6.63	NS
Sex: Male (%)	15 (2.9)	491 (97.1)	NS

RR, relative risk; NS, not significant

days (Table). A study reported an incidence of 1.6 per cent (29,060 person-months of follow up) after an interim analysis of four randomized controlled trials in Brazil, South Africa and the UK<sup>7</sup>. The present incidence was lower compared to 13.3 per cent (mean 34.8 days after second dose)<sup>8</sup> in one study from India which was conducted only among HCWs. Haas *et al*<sup>9</sup> found that vaccine effectiveness more than seven days after second dose was 95.3 per cent (95% CI = 94.9-95.7). The incidence rate was 3.1 in the vaccinated group compared to 91.5 in the non-vaccinated group/100,000 person days.

The risk of disease among doctors was 6.53 times more compared to others ( $P<0.001$ ). There were 83 (8.4%) doctors in the present study. Among these, six (7.2%) were positive after the second dose (Table). Angel *et al*<sup>10</sup> found that incidence rate among vaccinated HCWs was 4.7 compared to 149.8 per 100,000 person days among non-vaccinated HCWs.

All 25 individuals who developed COVID-19 had mild disease. Similar findings were reported by other studies irrespective of type of vaccine<sup>7,8</sup>. Haas *et al*<sup>9</sup> reported that incidence rate of COVID-19 related hospitalization was 0.2 among vaccinated groups (vaccinated with BNT162b2 vaccine) compared to 2.7 among non-vaccinated group/100,000 person days.

The present study was a single centre, without control arm study and included limited number of beneficiaries. The major limitation was that the results were based on an early follow up. Longer follow

up might have yielded a more realistic estimate of incidence of breakthrough infections. Another limitations of the study was that the date of first dose of vaccination was noted from the records or by history. Recall of date without any verification of records is likely to have introduced some error.

To conclude, the cumulative incidence of COVID-19 among vaccinated individuals was 1.6 per cent (95% CI = 0.95-2.54). HCWs were found to be at an increased risk compared to others. Younger age individuals were more commonly affected than elderly, and all developed cases were mild.

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