Comparison of in-hospital COVID-19 related outcomes between COVISHIELD and COVAXIN recipients

The rapid development of vaccines has offered hope in the fight against the COVID-19 pandemic. The Indian vaccination programme has primarily employed two vaccines, namely COVISHIELD (ChAdOx nCoV-19 vaccine) and COVAXIN (BBV152). In an interim analysis of four randomised controlled trials, the efficacy of two doses of the ChAdOx nCoV-19 vaccine for preventing symptomatic COVID-19 was 70.4%.[1] The BBV152 was found to have an overall efficacy of 77.8% against symptomatic COVID-19.[2]

The aforementioned vaccines offer protection, albeit at a lower magnitude, against the delta variant (B.1.617.2) of the SARS-CoV-2, the predominant strain during the devastating second wave in India. The efficacy of ChAdOx nCoV-19 against the delta variant was found to be 67.0%, while that of BBV152 was 65.2%.[2,3] Real-world data from Indian studies involving hospitalised patients during this wave have shown that vaccinated patients who developed breakthrough COVID-19 infection had lower mortality than unvaccinated patients. Muthukrishnan *et al.*[4] demonstrated that COVISHIELD reduced the mortality rate of fully vaccinated patients compared to unvaccinated patients (12.5% vs. 31.4%, $P < 0.0001$). A study from our hospital involving a cohort of 2080 hospitalised patients found that vaccination reduced the odds of mortality by 40%.[5]

However, there is a lack of studies comparing in-hospital outcomes between COVISHIELD and COVAXIN recipients. Thus, we performed a retrospective analysis to compare in-hospital COVID-related outcomes between COVISHIELD and COVAXIN recipients. Among patients hospitalised between April and June 2021, we found data on the type of vaccine received for 353 patients, among whom 181 (51.3%) received COVAXIN and 172 (48.7%) received COVISHIELD. Recipients of COVISHIELD were older than those of COVAXIN (mean ± SD ages: 55.1 ± 14.8 vs. 49.7 ± 17.0, respectively; $P = 0.01$) and were more likely to have diabetes mellitus (31.6% vs. 20.8%, $P = 0.02$) and hypertension (32.2% vs. 22.5%, $P = 0.04$). Patients were deemed to be fully vaccinated if they were hospitalised more than 2 weeks after the receipt of the second dose, whereas they were partially vaccinated if they had received either one dose or had received the second dose within 2 weeks prior to hospitalisation. Accordingly, among COVAXIN recipients (n = 181), 156 were partially vaccinated and 25 were fully vaccinated. Among COVISHIELD recipients (n = 172), 155 were partially vaccinated and 17 were fully vaccinated.

The in-hospital mortality did not differ between the recipients of COVISHIELD or COVAXIN in either the fully

Table 1: COVID-19 breakthrough infection-related in-hospital outcomes of partially and fully vaccinated recipients of COVISHIELD and COVAXIN

General Characteristics	Covaxin partially/fully vaccinated (*n*=181; 51.3%)	Covishield partially/fully vaccinated (*n*=172; 48.7%)	*P*	Covaxin only partially vaccinated (*n*=156; 50.2%)	Covishield only partially vaccinated (*n*=155;49.8%)	*P*	Covaxin only fully vaccinated (*n*=25; 59.5%)	Covishield only fully vaccinated (*n*=17; 40.5%)	*P*
Age in years (Mean±SD)	49.7±17.0	55.1±14.8	0.01*	50.1±17.0	55.7±14.8	0.01*	47.2±17.3	49.7±14.9	0.63
Gender									
Male	133 (73.5%)	115 (66.9%)	0.17	115 (73.7%)	102 (65.8%)	0.13	18 (72.0%)	13 (76.5%)	0.75
Female	48 (26.5%)	57 (33.1%)		41 (26.3%)	53 (34.2%)		7 (28.0%)	4 (23.5%)	
Comorbidities									
Hypertension	40 (22.5%)	55 (32.2%)	0.04*	34 (22.2%)	50 (32.5%)	0.04*	6 (24.0%)	5 (29.4%)	0.70
Diabetes mellitus	37 (20.8%)	54 (31.6%)	0.02*	32 (20.9%)	51 (33.1%)	0.02*	5 (20.0%)	3 (17.7%)	0.85
Coronary artery disease	3 (1.7%)	7 (4.1%)	0.18	2 (1.3%)	6 (3.9%)	0.16	1 (4.0%)	1 (5.9%)	0.78
Hypothyroidism	0 (0.0%)	3 (1.8%)	0.08	0 (0.0%)	3 (1.9%)	0.08	0 (0.0%)	0 (0.0%)	-
Asthma	3 (1.7%)	6 (3.5%)	0.28	2 (1.3%)	6 (3.9%)	0.16	1 (4.0%)	0 (0.0%)	0.40
Duration of Hospital Stay in Days (Mean±SD)	8.7±5.9	9.5±8.7	0.33	8.9±6.1	9.7±9.0	0.31	7.7±4.6	6.9±5.4	0.64
Disease severity									
Mild	104 (59.8%)	83 (49.1%)	0.04*	83 (55.3%)	74 (48.7%)	0.25	21 (87.5%)	9 (52.9%)	0.01*
Moderate	28 (16.1%)	49 (29.0%)	0.01*	27 (18.0%)	43 (28.3%)	0.03*	1 (4.2%)	6 (35.3%)	0.01*
Severe	42 (24.1%)	37 (21.9%)	0.62	40 (26.7%)	35 (23.0%)	0.46	2 (8.3%)	2 (11.8%)	0.72
ICU admission	8 (4.4%)	8 (4.7%)	0.91	8 (5.1%)	8 (5.2%)	0.98	0 (0.0%)	0 (0.0%)	-
NIV/HNFC	19 (11.2%)	22 (13.4%)	0.53	19 (13.0%)	18 (12.2%)	0.84	0 (0.0%)	4 (23.5%)	0.01*
Invasive mechanical ventilation	17 (14.1%)	20 (15.9%)	0.69	17 (15.7%)	19 (16.7%)	0.85	0 (0.0%)	1 (8.3%)	0.29
Death	28 (15.5%)	33 (19.2%)	0.36	28 (17.9%)	31 (20.0%)	0.65	0 (0.0%)	2 (11.8%)	0.08

ICU=Intensive care unit, NIV=Non-invasive ventilation, HFNC=High-flow nasal cannula

vaccinated [2 deaths (11.8%) vs. 0 deaths (0%), respectively; $P = 0.08$] or the partially vaccinated cohorts [31 deaths (20%) vs. 28 deaths (17.9%), respectively; $P = 0.65$]. Furthermore, there was no difference in the occurrence of severe disease, need for mechanical ventilation and duration of hospital stay among recipients of either vaccine in the fully or partially vaccinated cohorts [Table 1].

Our preliminary findings are limited by the small sample size and the lack of matching of baseline characters and treatment modalities between the two arms. Nonetheless, our finding of the lack of difference in the in-hospital outcomes between COVISHIELD and COVAXIN recipients is encouraging. Prospectively designed head-to-head studies with larger sample sizes comparing outcomes between recipients of different COVID-19 vaccines are warranted in the future.

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Conflicts of interest

There are no conflicts of interest.

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