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Original Research Article

# A Descriptive Study on AEFI Profile of COVID-19 Vaccines among Staffs and Students in A Tertiary Care Centre

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**Conflict of interest: Nil**

**Abstract:**

**Introduction:** Safe and effective vaccines were urgently needed to contain the COVID-19 pandemic. Indian drug regulators had given emergency approval to Covishield and Covaxin for vaccination of its health care and frontline workers in the first week of January 2021, and vaccination was started in the second week of January 2021.

**Objectives:** To monitor the adverse event following vaccination (AEFI) following the COVID-19 vaccination (Covishield or any other approved vaccines).

**Material and Methods:** A cross-sectional observational study was conducted after ethics committee approval. All the vaccinated staff and students at the tertiary care centre were eligible to participate in the study. Monitoring of AEFIs was done until 28 days after the first dose of vaccination. Data was collected as per the Pharmacovigilance Programme of India (PvPI) using Suspected Adverse Drug Reaction Reporting Form. An analysis of professional status, vaccine type, age, gender, weight, symptoms or signs, and causality was done, and the results were summarised.

**Results:** Data from 163 participants were included for analysis. A total of 211 AEFIs were reported by 115 (70.55%) participants. The remaining 48 (29.45%) participants did not report any AEFIs. Pain at the site of injection (43.60%), fever (14.21%), headache (8.53%), myalgia (6.63%), bodyache (5.21%), etc., were the common ADRs recorded in this study.

**Conclusion:** The majority of AEFIs reported were mild to moderate in severity. No serious AEFIs were noted during this study. These findings may act as supporting evidence for other research studies as well as clinical trials conducted in India, suggesting the safety of the vaccines approved in India.

**Keywords:** Covishield, Covaxin, COVID-19 Pandemic, Adverse Event Following Immunisation, Pharmacovigilance.



## Introduction

The World Health Organisation (WHO) declared Coronavirus Disease 2019 (COVID-19) a global pandemic on March 11, 2020. Older adults with certain co-morbidities and front-line workers were considered to have the highest risk of developing COVID-19 and its complications [1]. Even though no specific treatment was available to treat COVID-19, several pharmacological agents were used during the pandemic, such as Remdesivir, Favipiravir, Hydroxychloroquine, Tocilizumab,

Lopinavir-Ritonavir (LPV/RTV), and Convalescent plasma. The results were not so encouraging [2,3,4]. Therefore, prevention was considered the most important strategy to control the pandemic. Apart from regular prevention methods such as traditional social distancing, quarantine, use of disinfectants, and wearing of protective face masks, vaccination became vital [2,3].

Therefore, safe and effective prophylactic vaccines were urgently needed to contain the pandemic. [1,3]. Out of 78 vaccine candidates, 12 of them were approved in different parts of the world by January 2021 [3]. Since these vaccines were allowed to enter the market through accelerated vaccine development programmes, questions were raised on their safety and efficacy [2,5].

The efficacy and safety of COVISHIELD (AZD1222) were determined following a short-term analysis of data pooled from clinical trials that were conducted in the United Kingdom, Brazil, and South Africa. In these studies, approximately 23,745 participants aged 18 years and older were randomized and dosed with either COVISHIELD or a control. Participants who had one or more co-morbidities reported a vaccine efficacy of 62.7% (95% CI: 44.8; 74.8).

The common adverse events following immunisation (AEFIs) reported after the first dose of vaccination were: injection site tenderness (63.7%); injection site pain (54.2%); fatigue (53.1%); headache (52.6%); malaise (44.2%); myalgia (44.0%); pyrexia (includes feverishness (33.6%); fever >38ºC (7.9%), etc. The majority of AEFIs were mild to moderate in severity and resolved within a short period of time following the vaccination.

AEFIs to the second dose of vaccinations were of the same nature but “milder and less frequent." [4,5]. R. J. Kaur et al. conducted an analysis of adverse events (AEs) reported in 11 trials and published an article. According to them, AEs were mild to moderate, with few severe reactions that were unrelated to the test vaccine.

Serious adverse events (SAEs) were reported in four trials. Among these, 168 SAEs were reported in a study with the recombinant COVID-19 vaccine, i.e., the COVISHIELD arm. But only three were considered related to the vaccine under study: four SAEs reported in trials with Ad26.COV2.S as the test drug; five with Comirnaty (BNT162b1); and one with the COVAXIN (BBV152) vaccine. But none of these SAEs were considered related to the test drug under investigation [5].

Indian drug regulators (Drug controller general of India (DCGI)) gave emergency approval to COVISHIELD and COVAXIN for vaccination of its health care workers and frontline workers in the first week of January 2021and Vaccination was started from second week of January 2021 [6]. Therefore, this study was conducted with the objective of monitoring the AEFIs following the COVID-19 vaccination (COVISHIELD or any other approved vaccines) at our tertiary care center.

## Materials and Methods

This cross-sectional observational study was conducted after institutional ethics committee approval (CDSIMER/MR/0021/IEC/2021, dated October 4, 2021).

The data collected from January 2021 to June 2021 as per the Pharmacovigilance Program of India (PvPI) using the Suspected Adverse Drug Reaction Reporting Form (SADR form). The data collected from staff members and students meeting inclusion and exclusion criteria was included in the study.

**Inclusion and Exclusion Criteria:**

- All the staff and students who received COVID-19 vaccines at the vaccination center agreed to provide data until 28 days after the first dose.

A Google form was created based on the contents of the SADR form and shared with all the participants. Reminders were given on the 7th, 14th, 21st, and 28th days to provide the data on AEFIs, if any. Consent was obtained to utilize the collected data for analysis and publication purposes. Access to the data was limited to investigators, and the confidentiality of participants was ensured. Parameters like the professional status of participants, type of COVID-19 vaccination received, age, gender, weight, symptoms or signs, history of co-morbid conditions, concomitant medications, and causality based on WHO-UMC causality categories [7] were considered for analysis.

**Sample Size Calculation**

According to the literature [8], participants who were vaccinated with COVISHIELD (AZD1222) experienced local adverse events between 61% and 88% of the population and systemic reactions between 65% and 86%.

A sample size was calculated considering this information. It was estimated that a sample size of 163 is considered sufficient to achieve an estimated proportion of 88% at a 95% confidence interval, keeping design effect 1, with an estimated population size of 10,00,000.

**Statistical Analysis**

Statistical analysis was done using the Instat3 and Excel software packages. Descriptive analysis was done using mean, SD, and proportion for the purpose of drawing conclusions.

## Results

A total of 163 participants accepted to be part of the AEFI monitoring activities. Doctors (107, 65.64%) and MBBS students (45, 27.61%) accounted for 93.25% of the participants.

Additional details are provided in Fig No. 1.

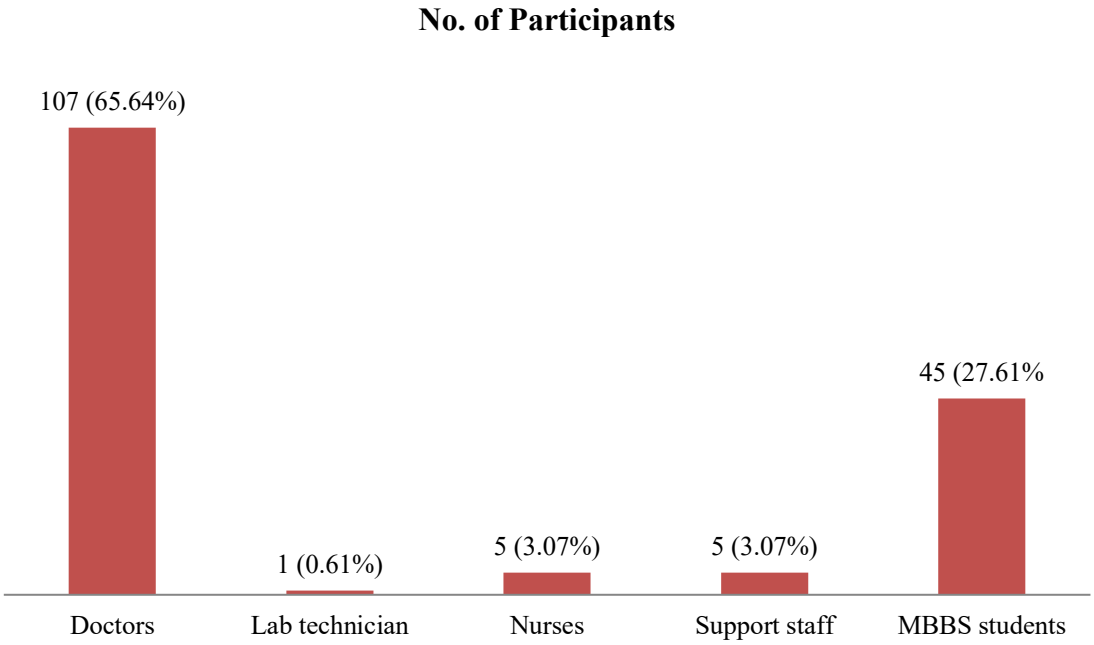


**Figure 1: Professional Designations of the participants**

Two types of vaccines were administered to the participants during the study period. COVISHIELD was received by 158 (96.93%), and 05 (3.07%) received COVAXIN. Both male and female participants agreed to participate in the study, and their demographic details are provided in Table No. 1.

**Table 1: Demographic data of study participants**

| **Parameter** | **N** | **Mean ± SD** |
|---|---|---|
| Mean age | 163 | 37.77 ± 12.272 |
| Weight | 163 | 62.2 ± 13.528 |
| **Gender Vs Age** | **N** | **Age - Mean ± SD** |
| Male | 67 (41.10%) | 36.37 ± 12.654 |
| Female | 96 (58.89%) | 28.57 ± 10.969 |

Out of 163 participants, 115 (70.55%) reported having at least one AEFI. Some participants experienced more than one AEFI. Therefore, the total number of AEFIs recorded during the study period was 211. Forty-eight (48, 29.45%) of the participants did not experience any AEFI. The common AEFIs recorded in our study include pain at the site of injection (43.60%), fever (14.21%), headache (8.53%), myalgia (6.63%), body ache (5.21%), etc. Other details are given in Table No. 2.

## Discussion

Most of the study participants have received COVISHIELD (158/163; 96.93%), whereas only five (3.07%) participants have received COVAXIN. Similar observations were made by Anusha Manda et al., where 70% of participants received COVISHIELD and 30% of the beneficiaries received COVAXIN [9].

This observation may be due to the government's sponsorship of making the COVISHIELD vaccine available to health care providers free of charge. But similar provisions were not made for COVAXIN. In addition, a later vaccine was approved with a condition to use in clinical trial mode as a part of an ongoing open-label, single-arm clinical trial [7,10]. In this study, 211 AEFIs were reported by 115 (70.55%) participants. The remaining 48 (29.45%) participants did not report any AEFI. The common types of AEFIs recorded in our study include pain at the site of injection (43.60%), fever (14.21%), headache (8.53%), myalgia (6.63%), body ache (5.21%), etc. Asefa et al. reported similar types of AEFIs experienced by 51.3% of the study population following the COVID-19 vaccination. Further to this, the investigators reported two thrombotic events (0.7%) which were considered to be serious events. But such events were not observed in the current

study [11]. Four clinical trials on the COVISHIELD vaccine were analyzed and found that injection site tenderness (63.7%), injection site pain (54.2%), fatigue (53.1%), and headache (52.6%) were the most frequent adverse drug reactions. Among these, the majority of them were found to be mild to moderate in severity. They did not require additional medical treatment and resolved within a few days after the vaccine [12]. Similar AEFIs were observed in the current study. None of the events were considered serious, as they did not require hospitalization or result in death. Variation in frequency and severity of observed adverse events may be due to differences in sample size and type of population included in these studies. According to the WHO-UMC causality assessment scale, AEFIs were probably (83.41%) or possibly (17.06%) related to the vaccine. These findings are supported by the absence of concomitant disease (92.63%) and concomitant medication (96.93%) in the majority of participants. Anusha Manda et al. reported that higher AEFIs were possibly related to vaccines in their study. These variations may be due to the presence or absence of other variable parameters such as co-morbid conditions, the use of concomitant medications, etc [9].

**Table 2: Adverse events reported after first dose of COVID-19 vaccination**

| Symptom / Signs | N | % of participants with ADR (=N/163*100) | % of ADR (=N/211*100) |
|---|---|---|---|
| Pain at injection site | 92 | 56.44 | 43.60 |
| Fever | 30 | 18.40 | 14.21 |
| Headache | 18 | 11.04 | 8.53 |
| Myalgia | 14 | 8.59 | 6.63 |
| Body ache | 11 | 6.75 | 5.21 |
| Chills | 8 | 4.91 | 3.79 |
| Malaise | 8 | 4.91 | 3.79 |
| Tiredness | 5 | 3.07 | 2.36 |
| Dizziness | 3 | 1.84 | 1.42 |
| Drowsiness | 3 | 1.84 | 1.42 |
| Giddiness | 3 | 1.84 | 1.42 |
| Nausea | 3 | 1.84 | 1.42 |
| Fatigue | 2 | 1.23 | 0.94 |
| Weakness | 2 | 1.23 | 0.94 |
| Generalized Weakness | 1 | 0.61 | 0.47 |
| Low Potassium | 1 | 0.61 | 0.47 |
| Burning eyes | 1 | 0.61 | 0.47 |
| Burning micturition | 1 | 0.61 | 0.47 |
| Altered Sensorium | 1 | 0.61 | 0.47 |
| Rigors | 1 | 0.61 | 0.47 |
| Sore Throat | 1 | 0.61 | 0.47 |
| Swelling at injection site | 1 | 0.61 | 0.47 |
| Tenderness | 1 | 0.61 | 0.47 |
| Participants with no ADRs | 48 | 29.45 | - |
| Participants with at least one ADRs | 115 | 70.55 | - |

The causality assessment of AEFIs was assessed using the WHO-UMC causality assessment method7. AEFIs were either possibly (17.06%) or probably (83.41%) related to the COVID-19 vaccines administered during the study period. Other details are provided in Table No. 3.

**Table 3: Causality of ADRs based on WHO-UMC causality assessment method**

| Causality | No of ADRs (%) |
|---|---|
| Unlikely | 0 (0.0) |
| Un-accessible | 0 (0.0) |
| Unrelated | 0 (0.0) |
| Possibly related | 36 (17.06) |
| Probably related | 175 (83.41) |
| Definitely | 0 (0.0) |

The majority of participants did not have any concomitant disease (92.63%) or concomitant medication (96.93%). Details of concomitant diseases and medications are given in Table No. 4.

**Table 4: Details of Concomitant Disease and Medications of the Participants**

| Sl No. | Parameter | Yes/ No | N = 163 (%) | Comments |
|---|---|---|---|---|
| 1 | Concomitant Disease /Habituation | No | 151 (92.63) | Nil |
| | | Yes | 12 (7.36) | Presence of Allergy (6)[#], Hypertension (2), Poly Cystic Ovarian Syndrome (1), Hypothyroidism (1), Upper respiratory tract infection (1), Tinea Cruris (1), Recurrent Urinary tract infection (1), and Occasional alcohol consumption (1). |
| 2. | Concomitant Medication | No | 158 (96.93) | Nil |
| | | Yes | 5 (3.06) | Azythromycin 500 mg once daily for 5 days (1), Olmesertan 20 mg once daily (1), Itraconazole 100mg twice daily (1), Thyroxin sodium 100 micrograms once daily (1), and Paracetamol 325mg + Tramadol 37.5mg one tablet (1). |

**[#]Details of Allergy - Dust (3), Food (1), Insect (1), Pollen (1), and Drug (1)**

## Conclusions

In conclusion, after monitoring 163 healthcare workers for 28 days after the first dose of Covishield/Covaxin, 70.55% of the participants experienced adverse events following immunization. Out of all the AEFIs, pain or tenderness at the injection site was more common than others. Fever, headache, or dizziness was the other common adverse events. Among all the self-reported adverse events, 83.41% of them were considered to be probably related to vaccines. The adverse events were mild to moderate in severity. None of the adverse events were considered serious, as they did not require hospitalization or result in death. These findings from our study act as supporting evidence for other research studies as well as clinical trials conducted in India, suggesting the safety of the vaccines.

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