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Original Research Article

ADR Profile of Covishield and Covaxin among Young Adults (18-45 Year) in a District in Northern India: A Comparative Study

Deb T[1], Beniwal A[2], Kamra N[3], Kaur M[4]

[1]MD, Department of Pharmacology, Adverse Drug Reaction Monitoring Centre, Kalpana Chawla Govt Medical College, Karnal, India

[2]M Pharm, Department of Pharmacology, Adverse Drug Reaction Monitoring Centre, Kalpana Chawla Govt Medical College, Karnal, India

[3]MD, Department of Dermatology, Adverse Drug Reaction Monitoring Centre, Kalpana Chawla Govt Medical College, Karnal, India4

[4]MD, Department of Pharmacology, Adverse Drug Reaction Monitoring Centre, Kalpana Chawla Govt Medical College, Karnal, India

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Corresponding author: Dr Manmeet Kaur

Conflict of interest: Nil

Abstract

Background: The Covid-19 vaccines: Covishield and Covaxin have been approved by the Govt. of India for emergency use against SARS COV-2 virus. The vaccination drive was initiated on 16 Jan 2021 among healthcare workers. Following this, age groups above 45 years and people with co-morbidities were covered. On 1st May 2021, the vaccination drive was extended to cover young adults (18-45 years).

Objective: To evaluate Adverse Drug Reaction (ADR) profile of Covishield and Covaxin among young adults (18-45 years) in Karnal district, Haryana.

Methods*:* A descriptive cross-sectional study was performed for 2 months at the ADR Monitoring Centre located at Kalpana Chawla Government Medical College (KCGMC), Karnal, Haryana, India. ADRs of both vaccines (Covishield and Covaxin) among young adults (18-45 years) voluntarily reported at the ADR-monitoring centre from various vaccination centres of Karnal District, by healthcare workers or beneficiaries were recorded and selected for the study.

Results: One hundred and eleven ADRs were reported amongst 51 beneficiaries (85 ADRs among 38 Covishield vaccinated beneficiaries and 26 ADRs among 13 Covaxin vaccinated beneficiaries). There was no significant difference in the numbers of ADRs reported among males and females in both vaccine groups during the study period. The common ADRs reported in both vaccine groups were fever followed by body ache. One serious ADR was reported, which required admission in the hospital but was discharged on the same day. The majority of the suspected ADRs were classified as 'Probable' as per the WHO-UMC scale.

Conclusion: Among both the vaccine beneficiaries, no event of death or disability was reported. Common ADRs observed were fever, body ache, and weakness. There was no significant difference in the number of ADRs reported in the two vaccine groups.

Keywords: ADRs, beneficiaries, Covaxin, Covishield, vaccine, COVID

Introduction

The first case of novel coronavirus infection was detected in China's Wuhan province [1]. Since its emergence it has spread around the globe, despite intricate efforts by WHO and Governments to contain the infection, primarily owing to the highly contagious nature of this virus [2].

It is a highly infectious virus and tends to spread by the inhalation of respiratory aerosols, direct human contact, and via fomites. Social distancing, personal hygiene, frequent hand washing or sanitizing using alcohol (61-70%) based hand-sanitizers, and disinfection of the surfaces are some steps that can protect the individuals from getting infected [3].

The incubation period of the virus ranges from 2-14 days with a median of 5.1 days [4]. The symptoms include fever, dry cough, fatigue, shortness of breath, chills, muscle pain, headache, gastric disturbances, and weight loss. However, a large population of infected patients have no or mild symptoms and remain largely asymptomatic [5].

Analysis of herd immunity in COVID-19 globally has shown the urgent need for efficacious

COVID-19 vaccines. Currently, the vaccine development efforts have started to realize. Some of the leading vaccine candidates have shown positive results in the prevention of clinical disease. Vaccination drive commenced in India with frontline healthcare workers on 16th Jan 2021.

India's Drug regulatory authority has approved restricted emergency use of Covishield (the name employed in India for the Oxford-AstraZeneca vaccine) and Covaxin, the first indigenous vaccine produced by Bharat Biotech. Covaxin is developed and manufactured by Bharat Biotech International Limited, in venture with the National Institute of Virology of ICMR. Covaxin is an inactivated-virus vaccine which is developed in vero cells. Inactivated virus is combined with Alhydroxiquim-II (Algel-IMDG), chemosorbed imidazoquinoline on aluminium hydroxide gel, used as an adjuvant for boosting immune response and longer-lasting immunity [6].

ChAdOx1 nCoV19 is an adenoviral vector-based (non-replicating vector) vaccine. The virus used as a vehicle to introduce viral genes of interest into cells, transcribed into viral proteins, and present to the immune system via MHC I. University of Oxford in collaboration with Sweden based pharmaceutical company AstraZenca has developed Covishield vaccine [7].

The common side effects observed for both vaccines during clinical trials were fever, myalgia, and nausea [7-9]. While initially the vaccine programme was run for above 45 years of age, the Govt of India has extended the eligible age group for vaccination to 18-45 years from 1st May 2021.

There is widespread confusion amongst the general public regarding the choice between the two vaccines which seem to curtail their participation to some extent. There is no comparative study on the safety of the two vaccines in post-marketing surveillance. Hence, the present study is conducted to meet the desired objective i.e. to compare the ADR profile of the two vaccines in young adults (18-45 years of age).

Material and Methods

A descriptive Cross-sectional study was performed for 2 months at the ADR Monitoring Centre located at Kalpana Chawla Government Medical College (KCGMC), Karnal, Haryana, India. ADRs of both vaccines (Covishield and Covaxin) among young adults (18-45 years) voluntarily reported at the ADR-monitoring centre from various vaccination centres of Karnal District, by healthcare workers or

beneficiaries were recorded and selected for the study. Among all the ADRs reported, ADRs of young adults (18-45 years) were selected for the study.

The tool of data collection was the Suspected Adverse Drug Reaction Reporting form and Case Notification form as prescribed by the Pharmacovigilance Programme of India (PvPI). All the minor, as well as serious AEFI, were reported in the forms. Case Notification form was only filled for Serious AEFI. Causality Assessment of suspected ADRs was done using the WHO-UMC Causality Assessment Scale.

ADR reports with causality: Certain/Probable/Possible was considered for further analysis for ADR profile. ADR profile was analyzed with information in suspected ADR report including various demographic characteristics like patient details (sex, Age, History), treatment given to mitigate ADR, recovery status of ADR, and seriousness of reaction.

Results

During the study period, number of beneficiaries vaccinated with Covishield and Covaxin was 1,21,195 and 35,595 respectively. Out of 1, 21,195 beneficiaries (Covishield group), 38 beneficiaries reported ADRs, and out of 35,595 beneficiaries (Covaxin group), 13 beneficiaries reported ADRs.

There was no significant difference in the incidence of ADRs among both vaccines during the study period. (z=0.46, p=0.648). Among the beneficiaries who reported ADRs, 85 ADRs were recorded in Covishield vaccinated beneficiaries (n=38), and 26 ADRs were recorded in Covaxin vaccinated beneficiaries (n=13).

Among these 51 beneficiaries who reported ADRs during the study period, 26 were male and 25 were female. The gender-wise distribution of ADRs of both the vaccine among beneficiaries who reported ADRs are shown in Table 1. There is no significant difference in the incidence of ADRs among males and females in both vaccines during the study period. (Chi-square- 0.057, p=0.811)

Common ADRs reported in both vaccines were fever followed by body ache. Table 2 depicts the frequency of different ADRs reported for both the vaccines during the study period.

Out of the 51 healthcare workers who reported ADRs during the study period, only 1 experienced serious ADR which was associated with Covishield. The beneficiary experienced hematuria, pain in the vagina along with fever and vomiting which lead to hospitalization. The beneficiary started recovering from the events after treatment and was discharged on the same day of admission.

No death was reported during the study period. No beneficiary reported any adverse event during the observation period i.e. 30 minutes following vaccination. No anaphylactic reaction was reported among the beneficiaries. However, the majority of the ADRs were experienced on the same day of vaccination.

The distribution of ADRs as per seriousness criteria is shown in Figure 1. Most of the beneficiaries (73%) had recovered from the ADRs at the time of reporting, 73% of the ADRs required treatment with over the counter (OTC) drugs eg. paracetamol for recovery. The distribution of ADRs as per recovery status among both vaccines is depicted in Figure 2.

During the study period, 26 different types of ADRs were reported. Out of these types, many ADRs were unlisted in the fact sheet of vaccines namely loose motion, improper wound healing, Hematuria, pain in the vagina and pain in the left side of the body etc. The frequency of unlisted ADRs is depicted in Table 3.

The majority of the suspected ADRs i.e. were classified as ‘Probable’ 84% followed by

possible 13% as per the WHO-UMC scale. The distribution of total ADRs as per the WHO-UMC scale is depicted in Figure 3. The distribution of ADRs as per the WHO-UMC Causality scale among both vaccines is depicted in Table 4.

Table 1: Gender-wise distribution of ADRs among beneficiaries who reported ADRs

Gender	Covishield	Percentage	Covaxin	Percentage	Total	Percentage
Male	19	50.0%	7	53.8%	26	51.0%
Female	19	50.0%	6	46.2%	25	49.0%

Table 2: Distribution of various types of ADRs among both vaccines.

Name of ADR	Covishield(n)	Percentage	Covaxin (n)	Percentage	Total
Fever	34	40	5	19	39
Body ache	13	15	5	19	18
Weakness	6	7	2	8	8
Headache	6	7	1	4	7
Dizziness	3	4	1	4	4
Vomiting	4	5	0	0	4
Vertigo	2	2	1	4	3
Myalgia	1	1	2	8	3
Pain in legs	3	4	0	0	3
Low b.p	1	1	2	8	3
Loose motion	2	2	1	4	3
Joint pain	1	1	1	4	2
Itching	0	0	1	4	1
Neck pain	1	1	0	0	1
Pain in left sideof body	1	1	0	0	1
Pain in vagina	1	1	0	0	1
Injection site Bruise	0	0	1	4	1
Light headedness	0	0	1	4	1
Hematuria	1	1	0	0	1
Improperwound healing	0	0	1	4	1
Left hand pain	0	0	1	4	1
Chest pain	1	1	0	0	1
Abdominal pain	1	1	0	0	1
Tightnessinpre-existing nodule	1	1	0	0	1
Darkness under eye	1	1	0	0	1
Anorexia	1	1	0	0	1

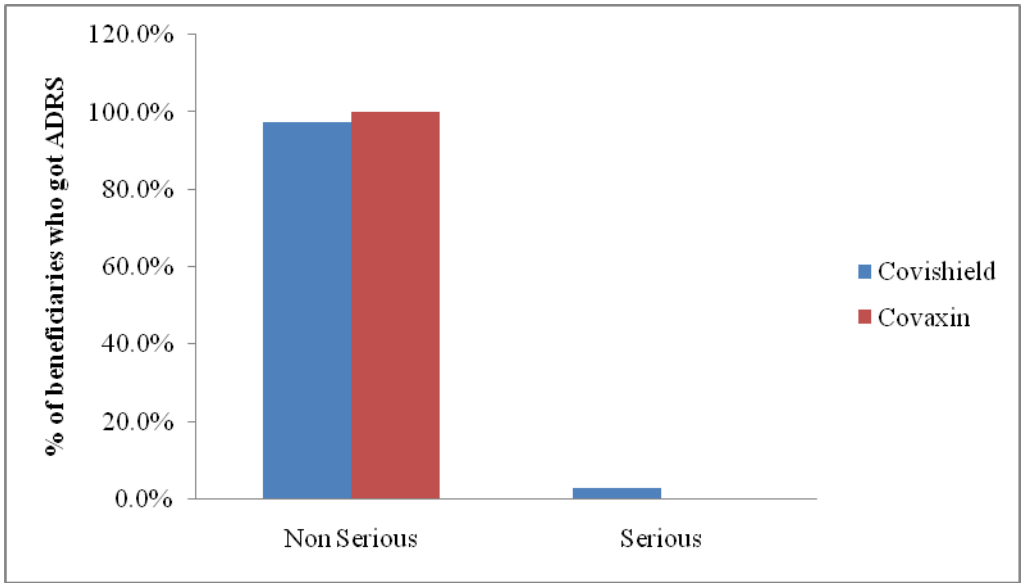

Figure 1: Distribution of ADRs as per seriousness.

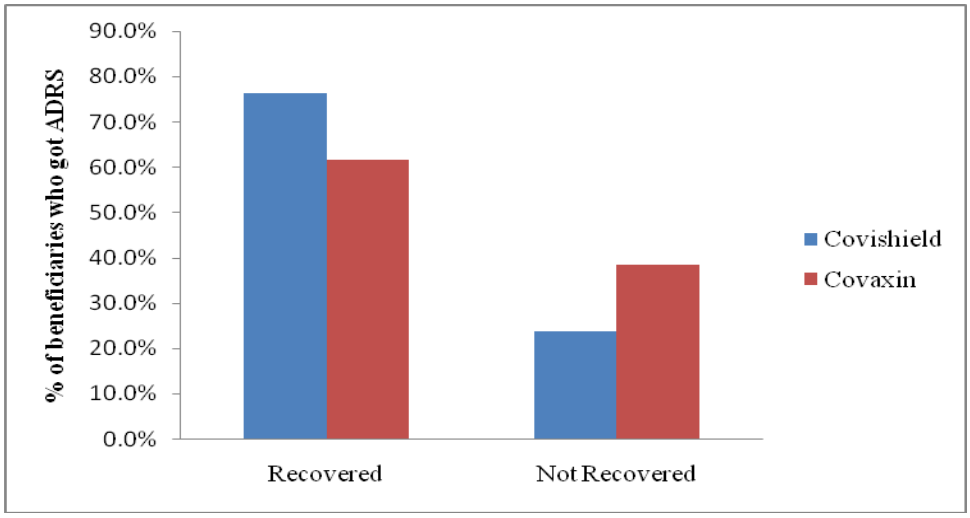

Figure 2: Distribution of ADRs as per recovery status.

Table 3: Distribution of unlisted adverse events in vaccines

Name of unlisted Adverse events	Frequency in Covishield	Frequency in Covaxin
Vertigo	2	1
Weakness	6	2
Pain in vagina	1	0
Injection site bruise	0	1
Light headedness	0	1
Hematuria	1	0
Improper wound healing	0	1
Chest pain	1	0
Tightness in pre-existing nodule	1	0
Darkness under eye	1	0

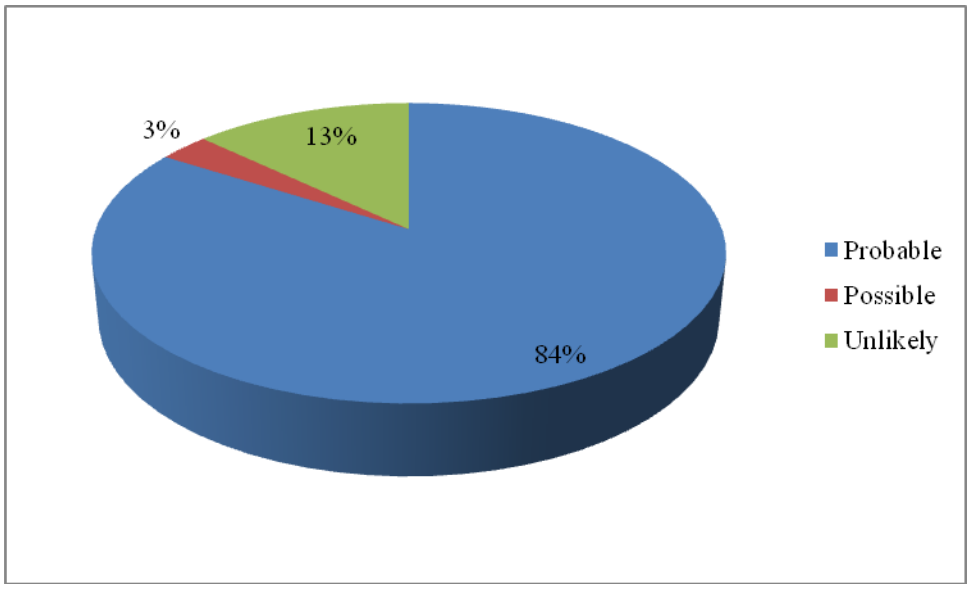

Figure 3: Distribution of ADRs as per Causality assessment

Table 4: Distribution of ADRs as per Causality assessment among both vaccines.

Classification as per WHO-UMC Scale	Covishield	Percentage	Covaxin	Percentage	Total	Percentage
Probable	74	87%	19	73%	93	84%
Possible	08	9%	07	27%	15	13%
Unlikely	03	4%	0	0%	3	3%

Discussion

In the current study, the common ADRs reported by the beneficiaries of both the vaccines was fever followed by body ache. Fever comprised 40% of total ADRs in Covishield beneficiaries and 19% of the total ADRs in Covaxin beneficiaries and Body ache comprised 15 % and 19% in Covishield and Covaxin beneficiaries respectively.

The results of the present study regarding ADRs reported in the Covishield beneficiaries corroborates with other studies conducted on the ChAdOx1 nCoV-19 vaccine. Folgetti *et al* conducted a randomised controlled trial in the UK for ChAdOx1 nCoV-19 vaccine in comparison with Adenovirus-vectored vaccine (ChAdOx1 nCoV-19) expressing the SARS-CoV-2 spike protein with a meningococcal conjugate vaccine (MenACWY) given as control. The most common ADRs in participants who received the ChAdOx1 nCoV-19 group were fever, chills, muscle ache, headache, and malaise which subsided after the use of paracetamol. The majority of adverse events reported were mild or moderate in severity, and all were self-limiting [10]. Similarly, in the present study majority of the ADRs were non-serious and self-limiting in nature. Only one ADR was classified under the category of serious, as the beneficiary required hospitalization but started recovering after initiation of treatment in the hospital and was discharged on same day.

Voysey M *et al* conducted an interim analysis of four clinical trials on the ChAdOx1 nCoV-19 vaccine. The most frequently reported adverse reactions were tenderness at the injection site (63.7%), pain at the injection site (54.2%), headache (52.6%), and fatigue (53.1%). In the study, most of the adverse

reactions were mild-to-moderate in severity and resolved within a few days of vaccination. Similarly, in the current study, all the adverse drug reactions are also resolved within few days of vaccination [11].

Ella *et al* 2021 conducted a double-blind, randomised, multicentre, phase 2 clinical trial to evaluate the immunogenicity and safety of Covaxin (BBV152) in healthy adults and adolescents (aged 12–65 years) at nine hospitals in India. The most common adverse event in the phase 2 trial was headache, fatigue, and fever. No severe or life-threatening (i.e, grades 4 and 5) solicited adverse events were reported **[**12].

The findings of this study are almost in consonance to the present study, where the Covaxin beneficiaries too reported fever, headache and body ache as the most frequent ADRs. Also, in the same group of beneficiaries in our study, there was no serious adverse event almost matching with the above-mentioned study.

So far, we did extensive literature research and found no validated published study that compared the safety profile of the two vaccines.

Conclusion

In both the vaccines, no event of death was reported. However, there was a reporting of one serious adverse event from the Covishield vaccine beneficiary which required her to be hospitalized but recovered and discharged on the same day upon recovery. Common ADRs observed in both vaccines were fever, body ache, and weakness. There was no significant difference in the incidence of ADRs in both vaccine groups.

Hence, it can be concluded that both vaccines are equally safe for use in young adults. For generalization of the results to the whole population, long-term studies and multi-centric studies are required to confirm the safety profile.

Ethics approval

The study protocol was approved by the Ethics Committee of KCGMC, Karnal, Haryana.

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References

1. Pandi-Perumal SR, Gulia KK, Gupta D, Kumar VM. Dealing with a pandemic: the Kerala Model of containment strategy for COVID-19. *Pathog Glob Health* 2020; 114: 232–233.
2. Kaur SP, Gupta V. COVID-19 Vaccine: A comprehensive status report. *Virus Res* 2020; 288: 198114.
3. CDC. CDC Works 24/7. *Centers for Disease Control and Prevention* 2021. Available at: https://www.cdc.gov/index.htm. Accessed August 25, 2021.
4. Lauer SA, Grantz KH, Bi Q, *et al.* The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application. *Ann Intern Med* 2020; 172: 577–582.
5. Shang W, Yang Y, Rao Y, Rao X. The outbreak of SARS-CoV-2 pneumonia calls for viral vaccines. *npj Vaccines* 2020; 5: 1–3.
6. Kumar VM, Pandi-Perumal SR, Trakht I, Thyagarajan SP. Strategy for COVID-19 vaccination in India: the country with the second highest population and number of cases. *npj Vaccines* 2021; 6: 1–7.
7. Ophinni Y, Hasibuan AS, Widhani A, *et al.* COVID-19 Vaccines: Current Status and Implication for Use in Indonesia. *Acta Med Indones* 2020; 52: 388–412.
8. Serum Institute of India - ChAdOx1 nCoV- 19 Corona Virus Vaccine (Recombinant) - COVISHIELD. Available at: https://www.seruminstitute.com/product_

covishield.php. Accessed August 26, 2021.
9. COVAXIN - India's First Indigenous Covid-19 Vaccine | Bharat Biotech. Available at: https://www.bharatbiotech.com/covaxin.html. Accessed August 26, 2021.
10. Folegatti PM, Ewer KJ, Aley PK, *et al.* Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomised controlled trial. *The Lancet* 2020; 396: 467–478.
11. Voysey M, Clemens SAC,Madhi SA,*et al.* Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. *Lancet* 2021; 397: 99–111.
12. Ella R, Reddy S, Jogdand H, *et al.* Safety and immunogenicity of an inactivated SARS-CoV-2 vaccine, BBV152: interim results from a double-blind, randomised, multicentre, phase 2 trial, and 3-month follow-up of a double-blind, randomised phase 1 trial. *Lancet Infect Dis* 2021; 21: 950–961.