



CUTANEOUS ADVERSE EFFECTS AFTER COVID-19 VACCINATION IN A TERTIARY CARE CENTRE

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ABSTRACT

COVID-19 infection with its highly contagious nature and rapidly mutating properties has caused high morbidity and mortality worldwide. Rapid development and approval of vaccines has emerged as the defining management of this continuously evolving disease as we study more about it. In this article, we study the cutaneous adverse effects after Covishield or ChAdOx1 nCoV-19 and Covaxin or BB1V52 vaccine. As per our observations, the local injection site reactions like erythema, edema, pain and itching were far more common but self resolving. The more serious side effects like Herpes Zoster infection, Urticaria, Angioedema were uncommon but needed proper care and management. Understanding the possible range of adverse effects with vaccination is essentially crucial at the moment.

KEYWORDS : COVID-19 vaccines, adverse events, Covishield, Covaxin

INTRODUCTION

COVID-19 is a respiratory illness caused by 2019 novel coronavirus (2019-nCoV) or the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)¹. Its highly contagious nature, ability to mutate and affect multiple systems have led to high morbidity and mortality worldwide. The infectious capacity of COVID 19 has led to an exponential rise in the number of cases and an unprecedented load on the healthcare facilities. Vaccination has emerged as the defining management of this continuously changing disease as we study more about it.

Since the treatment options at present are limited and not completely curative. Vaccination provides the best course of action to combat this contagious and lethal disease. Diligent and ground-breaking work by researchers all over the world has provided us with a number of efficacious and safe vaccines within a short span of time. Covishield by Astrazeneca and Covaxin by Bharath Biotech are examples of the same and were the first vaccines to be introduced in India for mass vaccination.

Covishield or ChAdOx1 nCoV-19 vaccine contains simian adenovirus vector ChAdOx1, which is unable to replicate. It also plasminogen activator leader sequence³. The common side effects after the vaccine include fever, myalgia, tenderness, headache etc.

Covaxin or BB1V52 vaccine is a whole virion inactivated vaccine. The common side effects post vaccination include tenderness, swelling, erythema and itching at the injection site. Other side effects include fever, myalgia and vomiting².

Cutaneous manifestations for both these vaccines have been reported by dermatologists and physicians. But they have not been studied in detail. There is paucity of information when it comes to the skin manifestations per se. In this article, we have explored the various local and generalised adverse effects noted with the vaccines.

AIM:

To describe the cutaneous adverse effects observed after Covishield (ChAdOx1 nCoV-19) and Covaxin (BB1V52) vaccination at a tertiary care hospital in South India.

MATERIALS AND METHODS:

This is a descriptive study to assess the cutaneous side effects post vaccination with Astrazeneca Covishield and Bharath Biotech Covaxin. We retrospectively studied the health care professionals and students who were vaccinated from

January 2021 to May 2021, at KVG MCH, Sullia. The study was conducted from July 2021-August 2021. The Ethical Committee clearance was obtained from the Chairperson of the Institutional ethics committee. The responses were submitted anonymously and the identity of the individuals was kept confidential.

Individuals who had been vaccinated with either Covishield or Covaxin with either single or both the doses at KVG Medical College and Hospital, Sullia, DK, India, were analysed in the study. The lower age limit for vaccination was set at 18 years by the Government of India and the vaccine manufacturers at the time of the study, hence all individuals included in the study are above 18 years of age. Pregnant and lactating females and those with known allergies to the vaccine constituents were prohibited from receiving the vaccine during the study period, as per the guidelines.

A mobile application link containing the questionnaire was sent using text messages, instant messaging applications and e-mails. Consent was taken before the display of the questionnaire. 289 individuals were included in the study.

Statistical Analysis:

The data was analyzed using the google form analysis and MS Excel 2013 (part of MS Office professional 2013). It was organized into percentages using bar diagrams for analysis.

Observation:

In our study, 91% (263) individuals were vaccinated with Covishield, while the other 9% (26) received Covaxin. 61.6% (178) responses were from females. 52.2% of the participants are between 18-30 years of age, 21.5% fall between 31-45, 24.6% among 46-60 years and the rest are above 60 years of age. 26.3% individuals reported testing positive for COVID-19 infection in the past.

Demography and Vaccine details

RESULT:

Cutaneous side effects were more commonly noted after the first dose as compared to the second dose. Local side effects were most commonly reported.

Side effects at the site of vaccination:

Edema:

Questions about the local reactions revealed that swelling at and around the site was the most prevalent local cutaneous reaction. About half the subjects 127 (44.1%) noted it within the first few hours of receiving the vaccine, while the other quarter reported its appearance the next day.

Erythema:

Erythema was a common finding, seen in about 33(11.4%) participants of the study. It was most commonly noted within a few hours of the vaccination (Figure 1). It resolved spontaneously, within a week and did not require any treatment.

Itching:

Itching at the site of vaccination was not a common occurrence post vaccination. It was reported in 86 (30%) people.

Pain and tenderness:

Pain and tenderness at and around the site of vaccination was experienced by 173 (60%) of the responders. It was the most common side effect at the site of vaccination.

Local cutaneous reactions and their frequency

| SERIAL NO | FINDING | RESULTS n (%) |
|-----------|------------------|---------------|
| 1 | Erythema | 33 (11.4) |
| 2 | Swelling | 127 (44.1) |
| 3 | Itching | 86 (30) |
| 4 | Pain, tenderness | 173 (60) |

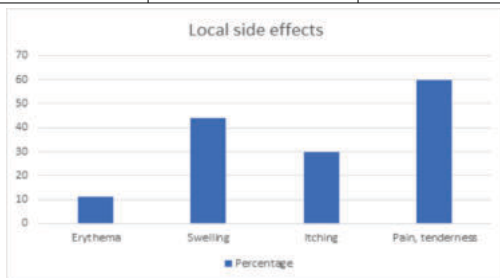


Figure 1- Local side effects demonstrating erythema and swelling

Generalised/ Distant cutaneous side effects:

Pernio or Chilblains like lesions:

Pernio is an inflammatory skin condition presenting after exposure to cold as pruritic and/or painful erythematous-to-violaceous acral lesions³. This is commonly seen as a symptom of COVID-19 infection. It was the most prevalent (14; 4.8%) noted in generalised cutaneous side effect in individuals who received the vaccine. It appeared within the week of vaccination in more than 70% of the individuals who developed this complication.

Urticaria:

Urticaria is commonly known as hives. It is characterized by itchy, edematous, erythematous and transient plaques⁴. Wheals were discerned in 4(1.4%) individuals (Figure 2). It was observed within a few minutes of vaccination. Some needed treatment while others noted self-resolution of the wheals.

Worsening of existing skin conditions:

The most commonly reported condition undergoing worsening was Psoriasis which was closely followed by eczema (Figure 3).

Acneiform eruption:

Acneiform eruption are disorders which resemble acne. They are characterized by papules and pustules⁵. Acneiform eruptions were reported in 12 (4.15%) individuals. (Figure 4)

Morbilliform rash:

Morbilli, an Italian diminutive of Il Morbo, is where the word morbilliform comes from. Il Morbo, or the big plague, was smallpox in the Middle Ages, while morbilli was the term for the "little plague," or measles, as both outbreaks had co-occurred since the sixth century^{6,7}. Any eruption that resembles the measles has come to be known as morbilliform throughout time. It was noted in 6 (2.07%) individuals. (Figure5)

Lichenoid reaction:

Lichenoid reaction is characterized by lesions which resemble Lichen Planus clinically and histopathologically⁸. It was noted in 3 (0.96%) responders. (Figure 6)

Herpes Zoster:

Herpes Zoster is caused by reactivation the Varicella Zoster virus, which lies dormant in the dorsal root ganglion after the varicella infection. It is reactivated in case of stress, immune-compromised conditions, malignancy etc⁹. It was an uncommon occurrence post vaccination. The stress of vaccination can be presumed to have led to reactivation of Varicella Zoster virus. (Figure 7)

Angioedema:

Angioedema is the swelling of skin and other deep tissues. It commonly involves the eyes, mouth, tongue, genitals and the extremities. Other symptoms include abdominal pain, dizziness and shortness of breath¹⁰. It was observed by 1 individual who received vaccination. The patient improved after 3 days course of dexamethasone along with Pheniramine maleate injection.



Figure 2-Acute urticaria in a patient within hours of vaccination.



Figure 3- Worsening of chronic plaque psoriasis post vaccination.



Figure 4- Acneiform eruptions developed within a week of vaccination.



Figure 5- Morbilliform lesions showing measles like maculopapular rash.



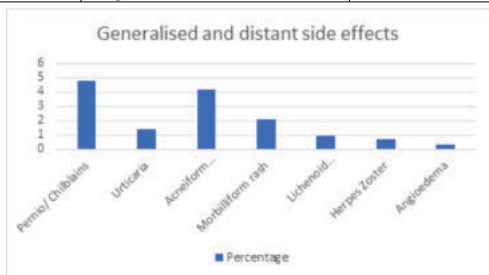
Figure 6- Lichenoid reaction post vaccination was a rare event.



Figure 7- Reactivation of Varicella Zoster virus in an elderly individual post vaccination lead to Herpes Zoster Oticus.

Systemic cutaneous reactions and their frequency

| S. No. | Finding | Results n(%) |
|--------|--------------------|--------------|
| 1 | Pemio | 14 (4.8) |
| 2 | Urticaria | 4 (1.4) |
| 3 | Acneiform eruption | 12 (4.15) |
| 4 | Morbiliform rash | 6 (2.07) |
| 5 | Lichenoid reaction | 3 (0.96) |
| 6 | Herpes Zoster | 2 (0.7) |
| 7 | Angioedema | 1 (0.3) |



CONCLUSION:

In our study, we assessed the various local, distant and generalised adverse cutaneous reactions noted with Covishield and Covaxin after the first and second doses. The adverse effects were noted more in females as compared to

males. The reason for the same is not specified but could be due to stronger immune response to foreign antigens in females¹¹.

Out of the local side effects, the most common complaint was pain and tenderness, followed by edema, itching and erythema respectively. Sun et al reported pain as the most common complaint followed by itch, induration, erythema and swelling. They also noted the local complaints were more frequent in the younger population, as compared to those above 60 years of age¹².

The generalised side effects were not as common as the local ones, but a few of them like angioedema and herpes zoster were more serious. They need supervised care and treatment. Erythromelalgia, erythema multiforme, lichen planus, and herpes simplex reactivation, pityriasis rosea-like reactions, petechial rash, and purpuric rash are among the various cutaneous reactions that have also been reported. Although, they have been reported with mRNA vaccines¹².

As such, clinically COVID-19 can range from being asymptomatic to multiple inflammatory syndrome and eventually lead to cardiac arrest. There is no definitive treatment at the moment. All the current regimens aim at management of the symptoms. Hence, vaccines for COVID-19 are the need of the hour. Due to the ongoing pandemic, they have been issued emergency approval. Thereby they have not been studied in as much detail as the other vaccines present in the market.

This study highlights the cutaneous side effects which should be anticipated post-vaccination. Both, doctors and general public should keep them at the back of their mind during vaccination.

It is crucial to understand and recognise the common cutaneous effects of the vaccine. As noted, most effects were mild and self-resolving. Educating the patients can alleviate the hesitation associated with vaccination and it can increase the awareness and acceptance about the safety of the vaccine.

The lesions were identified by the participants so morphological misclassification is possible. Also, as the study was based on recall, some patients may have recall bias. Here, we have discussed the complaints reported immediately and early i.e. upto a week of vaccination. More studies are needed to explore the long term effects of these vaccines.

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