International Journal of Dermatology

Report

# A prospective multicenter study on cutaneous reactions reported after Sinopharm COVID-19 vaccination

**Ahmed Shawky[1], MD, Emad M. Elrewiny[1], MD, Khaled Gharib[2], MD, Manar Sallam[3], MD, Mofreh Mansour[4], MD and Mahmoud A. Rageh[1], MD**

[1]Department of Dermatology, Faculty of Medicine, Al-Azhar University, Cairo, Egypt, [2]Department of Dermatology, Faculty of Medicine, Zagazig University, Zagazig, Egypt, [3]Department of Dermatology, Faculty of Medicine, Mansoura University, Mansoura, Egypt; and [4]Department of Dermatology, Faculty of Medicine, Al-Azhar University, Assiut, Egypt

**Correspondence**
Mahmoud A. Rageh, MD
Department of Dermatology
Faculty of Medicine
Al-Azhar University
Cairo
Egypt
E-mail: dr.mahmoudrageh@gmail.com

Conflict of interest: None.

Funding source: None.

doi: 10.1111/ijd.16391

## Abstract

**Background** The new coronavirus COVID-19 pandemic has had an unprecedented impact on global health and economic growth. A widely used vaccine is the weakened inactivated severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) virus (Sinopharm). Following major SARS-CoV-2 vaccination campaigns, cutaneous symptoms are on the rise.

**Methods** This study is a prospective observational study evaluating cutaneous reactions and time of recovery after Sinopharm vaccination. The cases involved were over the age of 18. The data were anonymized. On the registry's vaccine section, we tracked vaccination dates, skin reactions, and recovery times. All respondents who reported only a cutaneous reaction to the first vaccination dose received a follow-up contact asking about a second vaccination dose cutaneous reaction.

**Results** The study included 4560 cases. The mean age of all studied cases was 41.2 ± 6.1 years. There were dermatologic complications in 1190 patients (26.1%). There was induration at the injection site in 495 patients (10.9%), urticaria in 210 patients (4.6%), morbilliform eruption in 375 patients (8.2%), flare of skin site in 105 patients (2.3%), and angioedema in 105 patients (2.3%). The mean recovery days in all studied patients were 2.92 ± 0.94 days with a minimum recovery period of 2 days and a maximum of 7 days.

**Conclusions** Because Sinopharm's cutaneous reactions are frequently mild and self-limiting, vaccination should not be discouraged based on these findings. If the first vaccine dose creates a cutaneous reaction, there is no need to skip the second dose.

## Introduction

The pandemic triggered by the new coronavirus illness (COVID-19) has had an unparalleled impact on global health and economic growth. Rapidly developed public health interventions attempted to contain the spread of the disease but fell short of mitigating the epidemic's damage.[1,2]

Vaccination is presently the most reliable process for containing the pandemic, despite its slower than anticipated rollout, particularly in low- to middle-income nations, and the unclear length of protection. These vaccinations are expected to be more effective in reducing symptomatic sickness, severe disease development, and hospitalization, as well as in lowering fatality rates associated with the potentially seasonal severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) infection.[3,4]

Certain governments have allowed digital health passes/vaccine passports as a means of reestablishing regular life. The virus's spike protein (immunodominant antigen) is the primary target of licensed and prospective SARS-CoV-2 vaccines. The spike protein interacts with the host cell's ACE-2 receptor, starting viral entry, and a cascade of subsequent events leading to acute respiratory distress syndrome.[5,6]

The virus-related protein-based weakened inactivated SARS-CoV-2 virus vaccine (Sinopharm) is one of the most widely used vaccinations in Egypt. Following major immunization efforts for SARS-CoV-2 vaccinations, vaccine-related responses have become more prevalent, despite the virus's generally benign course. The relevance of these responses has not yet been determined.[7]

Cutaneous symptoms are becoming more prevalent following major immunization programs against SARS-CoV-2. The majority of these cutaneous adverse effects are transitory and of unknown clinical importance. Additionally, the significance of developing a cutaneous response in terms of vaccination is unknown. Chilblain-like lesions, vasculitis, pityriasis rosea, induration at the injection site, urticaria, morbilliform eruption, a flare of previously existing skin lesions, angioedema, and

erythema multiforme were all reported as cutaneous responses following vaccination. The purpose of this study is to determine the form and duration of cutaneous responses following Sinopharm immunization.[8–10]

## Methods

This study is a prospective observational study that was performed on 4560 cases that have been vaccinated with Sinopharm vaccine from March 2021 to December 2021. Data collection was made through a collaboration of four dermatology outpatient clinics located in Cairo, Zagazig, Mansoura, and Assiut. The study was conducted in accordance with the Declaration of Helsinki and its amendments. Written informed consents from the cases were obtained before enrollment in the study. No personal nor identifiable data were collected during the conduct of this study.

All cases involved were older than 18 years. The collected data included: age, gender, drug history, and any underlying medical or dermatologic conditions. The vaccine section of the registry collected data comprised: vaccination dates, skin response morphology, and time to recovery. The following cutaneous responses were included: induration at the injection site, urticaria, morbilliform eruption, skin lesion flare-up, and angioedema.

All patients who reported cutaneous reactions to the first vaccination dose received a follow-up contact asking about a second vaccination dose cutaneous reaction.

SPSS software (version 20.0) was used to enter and analyze data.

## Results

A total of 4560 individuals were enrolled (2295 males [50.3%], 2265 females [49.7%]). The mean age of all studied patients was 41.2 ± 6.1 years with a minimum age of 19 years and maximum age of 57 years (Table 1).

Out of 4560 studied patients, there were dermatologic complications in 1190 patients (26.1%). There was induration at injection site in 495 patients (10.9%), urticaria in 210 patients (4.6%), morbilliform eruption in 375 patients (8.2%), flare of skin lesions in 105 patients (2.3%), and angioedema in 105 patients (2.3%) (Table 1; Fig. 1).

Of the 105 patients that showed a flare of previously existing skin lesions, 75 patients were already diagnosed with psoriasis, 21 with chronic urticaria, seven with atopic dermatitis, and two with lichen planus.

All patients who reported cutaneous reactions after the first vaccination dose were followed up and evaluated after their second vaccination dose. Of the 1190 patients, only 871 have completed their second vaccination dose. Of these 871 individuals, 379 (43.5%) reported similar cutaneous reactions after their second dose, 89 (10.2%) reported different cutaneous reactions to what they experienced after their first vaccination dose, while 403 (46.3%) have not experienced any cutaneous reactions following their second vaccination dose.

**Table 1** Description of age, gender, cutaneous reactions, and period of recovery in all studied patients

| | | Studied patients (*N* = 4560) | |
|---|---|---|---|
| Age (years) | Mean ± SD | 41.2 ± 6.1 | |
| | Min - Max | 19–57 | |
| Gender | Male | 2295 | 50.3% |
| | Female | 2265 | 49.7% |
| Total complications | No | 3370 | 73.9% |
| | Yes | 1190 | 26.1% |
| Induration at injection site | No | 4065 | 89.1% |
| | Yes | 495 | 10.9% |
| Urticaria | No | 4350 | 95.4% |
| | Yes | 210 | 4.6% |
| Morbilliform eruption | No | 4185 | 91.8% |
| | Yes | 375 | 8.2% |
| Flare of already existing skin lesions | No | 4455 | 97.7% |
| | Yes | 105 | 2.3% |
| Angioedema | No | 4455 | 97.7% |
| | Yes | 105 | 2.3% |
| Recovery (days) | Mean ± SD | 2.92 ± 0.94 | |
| | Min - Max | 2–7 | |

The time between vaccine intake and the appearance of cutaneous reactions ranged from a few hours to 2 days. The mean recovery days in all studied patients were 2.92 ± 0.94 days with a minimum recovery period of 2 days and a maximum of 7 days (Table 1).

## Discussion

BBIBP-CorV, commonly known as the Sinopharm COVID-19 vaccine, is one of Sinopharm's two COVID-19 inactivated viral vaccines. BBIBP-CorV vaccine comprises an inactivated SARS-CoV-2 strain grown in Vero Cells. These cells replicate the SARS-CoV-2 virus numerous times and then are treated with beta-propiolactone, which deactivates the virus by binding to its genes.[10,11]

The vaccine was shown to be 79.34% effective in phase III clinical studies done in Argentina, Bahrain, Egypt, Morocco, Pakistan, Peru, and the United Arab Emirates (UAE). Following clinical studies, the vaccine was licensed for emergency use by the World Health Organization in May 2020. According to WHO recommendations, two doses of vaccination must be provided 3–4 weeks apart. The existing data on the vaccine's adverse effects indicate that moderate side effects such as headache, fever, and soreness at the injection site are possible.[12,13]

In our study, we considered the morphology of cutaneous responses to the Sinopharm vaccination. We noticed a wide variety of reported adverse effects following vaccination,

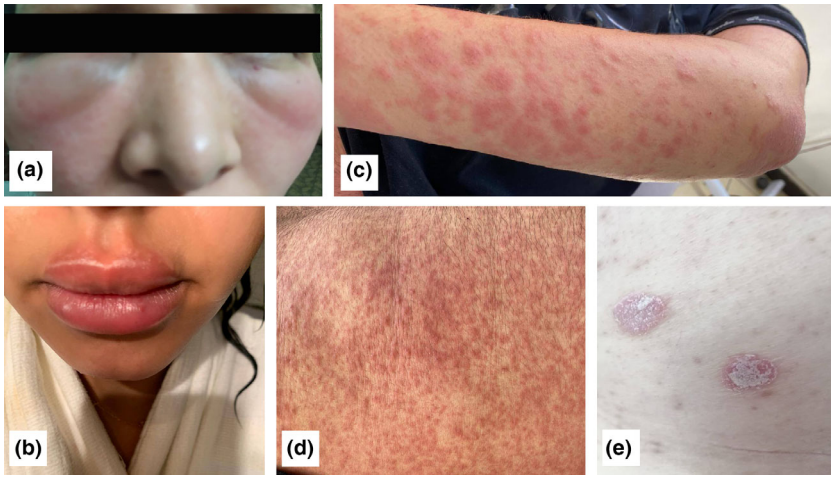


**Figure 1** (a, b) Angioedema affecting both eyes and lips in two different patients. (c) Urticarial eruptions affecting the arm. (d) Morbilliform rash affecting the trunk. (e) Exacerbation of pre-existing lesions of psoriasis.

including induration at the injection site, urticaria, morbilliform eruption, flare-up of skin lesions, and angioedema. Only 1190 (26.1%) of 4560 individuals with cutaneous observations following the first dosage were found to have cutaneous symptoms.

Out of 4560 studied patients, there were dermatologic complications in 1190 patients (26.1%). There was induration at the injection site in 495 patients (10.9%), urticaria in 210 patients (4.6%), morbilliform eruption in 375 patients (8.2%), a flare of skin disease in 105 patients (2.3%), and angioedema in 105 patients (2.3%).

In agreement with our study, Pourani et al. studied cutaneous adverse events related to different COVID-19 vaccines (AstraZeneca, Sinopharm, Sputnik V, Bharat, Cuba-Pasteur, Pfizer, and Moderna vaccines) in 867 patients. They reported that dermatologic reactions occurred in 30% of cases. In patients who received the Sinopharm vaccine (203 patients), there was induration at the site of injection in 21 cases (10.3%), urticaria was seen in five cases (2.5%), exanthematous rash in the form of morbilliform eruption was reported in eight cases (3.9%), and angioedema was reported in one case (0.5%).[8]

Our study was also supported by Hatmal et al., who reported the presence of rash and urticaria in 10.23% (47 cases) of the 459 cases who reported side effects after receiving Sinopharm vaccine.[14]

In contrast to our study, Saeed et al. reported the side effects following Sinopharm vaccination in 1080 cases. They found induration at the site of injection in 12 cases (1%) and allergy in 12 cases (1%).[15]

Also, in contrast to our study, Abu-Halaweh et al., in their study on 513 cases who received the Sinopharm vaccine, reported allergic reactions in four cases (0.8%) and skin rash in two cases (0.4%) after the first dose of the vaccine. They also reported allergic reaction in seven cases (1.4%) and skin rash in one case (0.2%) after the second dose of the vaccine.[16]

With regard to recovery time, the mean recovery days in all studied cases were 2.92 $\pm$ 0.94 days with minimum recovery days of 2 days and a maximum of 7 days.

In a recent study by Abu-Halaweh et al., results were close to ours as it reported that the recovery time for the dermatologic reaction was 8.4–9 days after the first dose and 4.4–5.7 days after the second dose.[16]

## Conclusion

The Sinopharm vaccine has been shown to be safe and effective, with just modest side effects. Sinopharm's cutaneous responses are often modest and self-limiting, therefore, immunization should not be discouraged based on these findings. There is no reason to avoid the second vaccination dosage if the first vaccine dose causes a cutaneous reaction following injection.

## References

1 Bhargava S, Negbenebor N, Sadoughifar R, Ahmad S, Kroumpouzos G. Global impact on dermatology practice due to the COVID-19 pandemic. *Clin Dermatol*. 2021;**39**(3):479–87.
2 Burlando M, Russo R, Cozzani E, Parodi A. COVID-19 "second wave" and vaccines: the dermatologists' perspective. *Int J Dermatol*. 2021;**60**(7):889–90.
3 Anderson RM, Vegvari C, Hollingsworth TD, Pi L, Maddren R, Ng CW, et al. The SARS-CoV-2 pandemic: remaining uncertainties in our understanding of the epidemiology and transmission dynamics of the virus, and challenges to be overcome. *Interface Focus*. 2021;**11**(6):20210008.
4 Gostin LO, Cohen IG, Shaw J. Digital health passes in the age of COVID-19: are "Vaccine Passports" lawful and ethical? *JAMA*. 2021;**325**(19):1933–4.
5 Sternberg A, Naujokat C. Structural features of coronavirus SARS-CoV-2 spike protein: targets for vaccination. *Life Sci*. 2020;**257**:118056.
6 Premkumar L, Segovia-Chumbez B, Jadi R, Martinez DR, Raut R, Markmann AJ, et al. The receptor binding domain of the viral spike protein is an immunodominant and highly specific target of antibodies in SARS-CoV-2 patients. *Sci Immunol*. 2020;**5**(48):eabc8413.
7 Temiz SA, Abdelmaksoud A, Wollina U, Kutlu O, Dursun R, Patil A, et al. Cutaneous and allergic reactions due to COVID-19 vaccinations: a review. *J Cosmet Dermatol*. 2022;**21**(1):4–12.

 

8 Pourani MR, Shahidi Dadras M, Salari M, Diab R, Namazi N, Abdollahimajd F. Cutaneous adverse events related to COVID-19 vaccines: a cross-sectional questionnaire-based study of 867 patients. *Dermatol Ther*. 2021;**35**:e15223.
9 McMahon DE, Amerson E, Rosenbach M, et al. Cutaneous reactions reported after Moderna and Pfizer COVID-19 vaccination: a registry-based study of 414 cases. *J Am Acad Dermatol*. 2021;**85**(1):46–55.
10 Xia S, Zhang Y, Wang Y, Wang H, Yang Y, Gao GF, et al. Safety and immunogenicity of an inactivated SARS-CoV-2 vaccine, BBIBP-CorV: a randomised, double-blind, placebo-controlled, phase 1/2 trial. *Lancet Infect Dis*. 2021;**21**(1):39–51.
11 Hadj HI. Covid-19 vaccines and variants of concern: a review. *Rev Med Virol*. 2021;**32**:e2313.
12 Wang H, Zhang Y, Huang B, Deng W, Quan Y, Wang W, et al. Development of an inactivated vaccine candidate, BBIBP-CorV, with potent protection against SARS-CoV-2. *Cell*. 2020;**182**(3):713–21.
13 Khandker SS, Godman B, Jawad MI, Meghla BA, Tisha TA, Khondoker MU, et al. A systematic review on COVID-19 vaccine strategies, their effectiveness, and issues. *Vaccines (Basel)*. 2021;**9**(12):1387.
14 Hatmal MM, Al-Hatamleh MAI, Olaimat AN, Hatmal M, Alhaj-Qasem DM, Olaimat TM, et al. Side effects and perceptions following COVID-19 vaccination in jordan: a randomized, cross-sectional study implementing machine learning for predicting severity of side effects. *Vaccines (Basel)*. 2021;**9**(6):556.
15 Saeed BQ, Al-Shahrabi R, Alhaj SS, Alkokhardi ZM, Adrees AO. Side effects and perceptions following Sinopharm COVID-19 vaccination. *Int J Infect Dis*. 2021;**111**:219–26.
16 Abu-Halaweh S, Alqassieh R, Suleiman A, al-Sabbagh MQ, AbuHalaweh M, AlKhader D, et al. Qualitative assessment of early adverse effects of Pfizer-BioNTech and Sinopharm COVID-19 vaccines by telephone interviews. *Vaccines (Basel)*. 2021;**9**(9):950.