

Case Report

Distant delayed hypersensitivity reactions after taking spike protein containing adenoviral vector vaccine for COVID-19

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ABSTRACT

COVID-19 epidemic is still going on and various SARS-CoV-2 vaccines are available for emergency administration since December 2020. It has many side effects as other vaccines, but as it is a new vaccine, different side-effects are not well-known to us. Here, we are reporting one side-effect, appearance of distant delayed hypersensitive reaction lesions after covid vaccine.

Keywords: COVID-19 vaccine, Side effects, Delayed hypersensitivity

INTRODUCTION

Various SARS-CoV-2 vaccines are available for emergency administration since December 2020. Those are mRNA vaccines-BNT-162b2 (Pfizer) and mRNA-1273 (Moderna), viral vector vaccine-Ad26.COVS.2.S (Johnson and Johnson), AZD-1222 (ChAdOx1 nCoV-19; AstraZeneca)¹ and others. In India, ChAdOx1 nCoV-19 and whole-virion inactivated SARS CoV-2 antigen (Strain: NIV-2020-770) are the mainstay for mass vaccination. Common cutaneous reactions documented after vaccination were delayed large local reactions [8%], local injection site reaction, urticaria, morbilliform, and erythromelalgia-all are from m-RNA vaccines.¹ Here we are describing cutaneous Adverse effects (AEs) of two patients, both got ChAdOx1 nCoV-19.

CASE REPORT

Case 1

KB, a 23 years female took vaccine first dose on 08/6/2021. From that night she felt extreme itching in different body parts-mainly extremities, neck and back. On next morning she noticed pruritic, erythematous

macule with, mild elevated, indurated plaque on right lateral surface of neck. Those macule and plaque extended from below jawline to junction of shoulder with lateral border of neck and anteriorly upto clavicle (Figure A). Skin folds were deep, prominent and on rotation of neck, the folds become thicker and more prominent. One atypical erythema Multiforme like lesion with erythematous ring and dusky centre, appeared on left middle toe (Figure B]. She had history of atopic rhinitis, and on regular antihistaminic. She had PCOD also, for that physical exercise and diet regulation was advised. She was treated with clobetasol ointment twice daily, antihistaminic increased to two doses daily and lesions started to subside after two days and completely cleared within 7 days.

Case 2

SD, a 44 years male got the jab on 04/6/2021. After 6 days he felt itching in different parts of body and on 7th day he noticed erythematous pruritic papules developed on both arms (Figure C and D). Crop of papules, 3-5 mm in size, spread over two erythematous areas on medial aspect of left arm. In right arm, there were two curved thin plaque with many papules formed an incomplete

annular morphology (Figure C and D). Systemic complications were not very serious, only mild general discomfort. Lesions gradually subsided in 3-4 days with topical betamethasone cream and oral antihistaminic. Significantly, both patients did not have any local injection-site changes. Both patients denied biopsy, complete haemogram devoid of any specific changes.

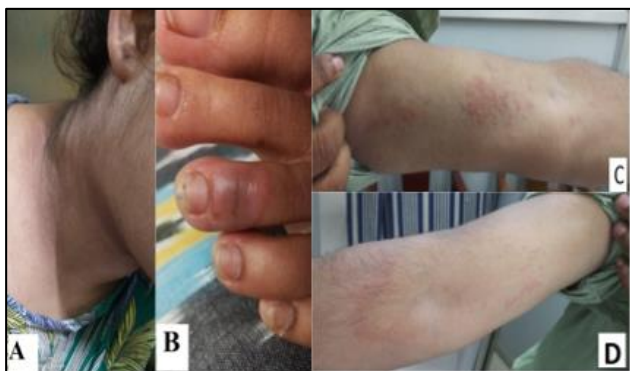


Figure 1 (A-D): Pt KB, erythematous mild elevated indurated plaque. Pt KB, EM like lesion on toe, pt SD erythematous, morbilliform pruritic papules, pt SD incomplete annular plaque with overlying tiny papules.

DISCUSSION

COVID-19 has wide clinical spectrum of skin manifestations- urticarial, chilblain-like, maculopapular, vesicular, livedoid and vasculitic lesions.^{2,3} Several hypotheses including viral hypersensitivity reactions, overexpression of type I interferons, COVID-19 induced coagulopathy, thrombotic microangiopathy and direct viral damage were suggested.⁴

AEs of COVID vaccines were also reported.

Allergic AEs due to COVID vaccination reported was of two types, immediate systemic reactions and delayed local reactions. “COVID arm,” or delayed localized cutaneous reactions to mRNA COVID-19 vaccine, in two series were consistent with clinical and histopathologic examinations findings for delayed-type hypersensitivity reactions.^{5,6} It is characterised by erythema, pruritus, induration and tenderness, not merely local pain, redness or swelling. The median (range) onset of the reactions was 7-8 days after the first dose, and the reaction had a median duration of 4 to 5 days.⁷ Allergic skin reactions such as skin burning, rashes, and red welts on the lips and face, were reported by 1.7% users across both types of vaccine⁸. But distant, maculopapular or plaque type of cutaneous reactions after ChAdOx1 was not reported previously. A maculopapular rash is a marker for many diseases, allergic reactions, and infections, mainly viral. Type IV hypersensitivity or delayed reactions generally initiate 48 h after vaccination demonstrating their peak between 72 and 96 hours.⁹ Skin lesions in our patients developed after some duration, this indicates delayed

reactions, though we were unable to document histopathological findings. The extreme pruritus felt immediately by one patient [KB] maybe due to sensitivity to polysorbate 80, which is an excipient of ChAdOx1 nCoV-19 COVID vaccine, which is one known allergen.¹⁰ Another reported hypersensitivity reaction includes erythema multiforme. This reaction can triggered by a number of allergens, including vaccines and vaccine components and very few cases of post-COVID-19 vaccination have been reported, all with COVID-19 mRNA vaccines.^{9,11} Neither local injection site-reactions nor delayed- type hypersensitivity reactions are contraindications to subsequent vaccination.¹² In our patients, adverse event appear after the suspected drug was administered and improved when the drug was discontinued or a specific antagonist was administered, leads the possibility of probable adverse drug reaction.¹³ Though there are no previous conclusive reports on this reaction, this temporal association directed us for distant delayed cutaneous reaction due to COVID-19 vaccination. More supportive evidences are required on this ground.

CONCLUSION

Delayed local type reaction are known, develops after 4-11 days after vaccination, resolve spontaneously, recurrence in half of such patients after 2nd dose vaccination. Other type of lesions includes chilblain-like, urticarial, vesicular, maculopapular, livedoid and vasculitis lesions. Delayed distant hypersensitive reactions so far not reported previously, whether it corresponds to a hypersensitivity reaction to the spike protein or to different components of the vaccine is still unknown, needs further evaluation. Delayed distant hypersensitivity reactions are not a contraindication to subsequent vaccination.

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REFERENCES

1. McMahon DE. Cutaneous reactions reported after Moderna and Pfizer COVID-19 vaccination: A registry-based study of 414 cases. *JAAD*. 2020;85(1):46-59.
2. Galvan Casas C, Catala A, Carretero Hernandez G. Classification of the cutaneous manifestations of COVID-19: a rapid prospective nationwide consensus study in Spain with 375 cases. *Br J Dermatol*. 2020;183:71-7.
3. Marzano AV, Genovese G, Moltrasio C. The clinical spectrum of COVID-19-associated cutaneous

- manifestations: an Italian multicentre study of 200 adult patients. *J Am Acad Dermatol.* 2021;84:1356-63.
4. Garrido Ruiz MC, Santos-Briz A, Santos-Briz A. Spectrum of clinicopathologic findings in COVID-19-induced skin lesions: demonstration of direct viral infection of the endothelial cells. *Am J Surg Pathol.* 2021;45:293-303.
 5. Johnston MS, Galan A, Watsky KL, Little AJ. Delayed Localized Hypersensitivity Reactions to the Moderna COVID-19 Vaccine: A Case Series. *JAMA Dermatol.* 2021;12.
 6. Blumenthal KG. Delayed Large Local Reactions to mRNA-1273 Vaccine against SARS-CoV-2. *nejm.* *Eng J Med.* 2021;384:13.
 7. Baden LR, El Sahly HM. Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine. *Engl J Med* 2021;384:403-16.
 8. Menni C, Klaser K. Vaccine side-effects and SARS-CoV-2 infection after vaccination in users of the COVID Symptom Study app in the UK: a prospective observational study. *Lancet Infect Dis.* 2021;21:939-49.
 9. Siegrist CA. Mechanisms Underlying Adverse Reactions to Vaccines. *J Comparative Pathol.* 2007;137(1):S46-50.
 10. Pitlick MM, Sitek AN, Kinate SA, Joshi AY, Park MA. Polyethylene glycol and polysorbate skin testing in the evaluation of coronavirus disease 2019 vaccine reactions. *Letter/Ann Aller Asthma Immunol.* 2021;126:722-41.
 11. Kano Y. Erythema multiforme after SARS-CoV-2 messenger RNA vaccination QJM. *Int J Med.* 2022;115(1):37-8.
 12. Kelso JM, Reenhawt MJ, Li JT. Adverse reactions to vaccines practice parameter 2012 update. *J Allergy Clin Immunol.* 2012;130:25-43.
 13. LiverTox: Clinical and Research Information on Drug-Induced Liver Injury. Bethesda (MD): National Institute of Diabetes and Digestive and Kidney Diseases. Adverse Drug Reaction Probability Scale (Naranjo) in Drug Induced Liver Injury. 2012. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK548069/>. Accessed on 25 November 2022.

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