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DERMATOLOGIC THERAPY WILEY

LETTER

Implication of mass COVID-19 vaccination on dermatology practice in 2021

Dear Editor,

The end of 2020 is bringing new hope with multiple COVID-19 vaccines demonstrated to be safe and effective in clinical trials. Vaccination around the world has now started with the frontrunners gaining approval in few countries. The development of these vaccines has been at an unprecedented pace, with accelerated timelines and an unconventional vaccine development pathway.[1] In a rush to get there first, cutting a few corners may help, but it necessitates enhanced vigilance in the post marketing phase.

Little do we realize, the platform for COVID-19 vaccine frontrunners is based on gene therapy. The COVID-19 vaccine from Moderna is mRNA based, Pfizer uses a lipid nanoparticle enclosure for the mRNA and Oxford relies on a chimpanzee adenoviral vector, nevertheless all contain sequences that encode the viral spike protein.[2] So essentially this is going to be the first-time gene therapy is delivered to the masses on a global scale.

Long-term effects of older generation vaccines are still a matter of research for dermatologists.[3] Thus, long term effects of gene therapy-based vaccines are practically unknown. Published studies of COVID-19 vaccines have shown high reactogenicity with fever, headache, and fatigue being more common than in other vaccines. This is a reflection of the inherent inflammatory nature of these vaccines, even though demonstrated as safe in interim results of trials conducted.[4,5]

Adenoviral vectors are known to induce unwanted responses from the innate immune system. Administered adenoviral vectors get trapped in the liver and spleen by the resident macrophages and induce inflammation through Toll like receptor (TLR) 2 and 9 dependent expression of cytokines. These adenoviral vectors are also known to stimulate CD4+ Th1 and humoral immune responses in humans. mRNA based vaccines also have inherent inflammatory activity leading to activation of multiple pathways of RNA induced inflammation through TLR 3,7,8. Lipid nanoparticles also have shown inherent immunostimulatory activity even when given without their mRNA content.[6]

Older generation vaccines with lower reactogenicity are still being implicated in causing flare of dermatological diseases like psoriasis.[3] Such observations lead to concerns regarding COVID-19 vaccines causing flares in patients of lupus and other dermatological diseases.[7]

Dermatologists worldwide could be perplexed facing unexplained flares of previously stable patients with inflammatory and autoimmune diseases on introduction of gene therapy based vaccines for COVID-19. Even though there is currently no evidence for it, it needs careful observation and due deliberation. The leading vaccines have shown to produce a predominant Th1 type response producing high levels of TNFa, IFNg, and IL2.[8] This would mean enhanced vigilance for flares in diseases like psoriasis, atopic dermatitis, pemphigus vulgaris, lichen planus, vitiligo, acne vulgaris, neutrophilic dermatosis, and connective tissue diseases that have a proven Th1 role in their pathogenesis.[9] It may likewise be prudent on part of practicing dermatologists to control disease activity prior to COVID-19 vaccination by stepping up therapy. The role of biologics targeting the pathways of inflammation which are stimulated in case of vaccine induced flares, may similarly be beneficial in treatment of such patients. Whatever the case may be, 2021 is going to be another challenging year for dermatology practice.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

DATA AVAILABILITY STATEMENT

No datasets were generated or analyzed during the course of this study.

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REFERENCES

1. Lurie N, Saville M, Hatchett R, Halton J. Developing Covid-19 vaccines at pandemic speed. *N Engl J Med*. 2020;382(21):1969-1973.
2. Arashkia A, Jalilvand S, Mohajel N, et al. Severe acute respiratory syndrome-coronavirus-2 spike (S) protein based vaccine candidates: state of the art and future prospects. *Rev Med Virol*. 2020. https://doi.org/10.1002/rmv.2183.
3. Mungui-Calzada P, Drake-Monfort M, Armesto S, Reguero-del Cura L, Lopez-Sundh AE, Gonzalez-Lopez M. Psoriasis flare after influenza

vaccination in Covid-19 era: a report of four cases from a single Centre. *Dermatol Ther*. 2020. https://doi.org/10.1111/dth.14684.

4. 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 (London, England)*. 2020;397:99-111. https://doi.org/10.1016/S0140-6736(20)32661-1.
5. Polack FP, Thomas SJ, Kitchin N, et al. Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine. *N Engl J Med*. 2020;383:1-13. https://doi.org/10.1056/NEJMoa2034577.
6. Singh S, Kumar R, Agrawal B. Adenoviral vector-based vaccines and gene therapies: current status and future prospects. *Adenoviruses*. Vol 13. London: IntechOpen; 2018. https://doi.org/10.5772/intechopen.79697.
7. Wadman M. Fever, aches from Pfizer, Moderna jabs aren't dangerous but may be intense for some. *Science*. 2020. https://doi.org/10.1126/science.abf7805.
8. Barrett J, Ewer K, Belij-Rammerstorfer S, et al. T cell and antibody responses induced by a single dose of ChAdOx1 nCoV-19 (AZD1222) vaccine in a phase 1/2 clinical trial. *Nat Med*. 2020;19:1-24. https://doi.org/10.1038/s41591-020-01194-5.
9. Coondoo A. The role of cytokines in the pathomechanism of cutaneous disorders. *Indian J Dermatol*. 2012;57(2):90-96. https://doi.org/10.4103/0019-5154.94272.