

## LETTERS TO THE EDITOR

# Alopecia areata after ChAdOx1 nCoV-19 vaccine (Oxford/AstraZeneca): a potential triggering factor?

Dear Editor,

Many dermatologists have been occupied with recording cutaneous associations with SARS-CoV-2 infection, and there are some reports about cutaneous side effects of its vaccines.<sup>1</sup> Only a few reports described a possible association between AA and COVID-19.<sup>2</sup>

Here, we report a case of recurrent alopecia areata (AA), in a middle-aged female patient, shortly after the ChAdOx1 nCoV-19 vaccine (Oxford/AstraZeneca), after a long period of disease stability.

## 1 | CASE PRESENTATION

In June 2021, a 32-year-old female patient attended our outpatient clinic with a complaint of a hairless patch involving the scalp that suddenly appeared 2 days ago. According to the history, the patient was vaccinated against SARS-CoV2 few days before the appearance of the lesion, and the patient did not complain of any associated systemic symptoms. She reported no other underlying diseases except for a previous controlled mild attack of AA followed by disease stability for 6 years. She also reported a previous COVID attack one year ago. No family history for AA was present or history of any drug intake.

Physical examination revealed a sharply demarcated patchy hair loss on the scalp without any scarring or scaling. General examination revealed no other associated cutaneous or systemic abnormalities.

KOH examination was negative for fungal infection. Our provisional diagnosis was AA. Trichoscopic examination showed black dots, broken hairs, and newly growing hairs with some exclamation mark hairs (Figure 1). Laboratory investigations including liver, kidney, thyroid functions, anti-thyroid antibodies, and antinuclear antibody (ANA) test were within normal limits.

## 2 | DISCUSSION

Molecular mimicry is a well-established mechanism that could contribute to autoimmunity associated with a wide variety of viruses. The antibody-mediated response against viruses may cross-react

with self-antigens, possibly leading to autoimmune diseases. Current data describe SARS-CoV-2 to be an additional virus that has molecular mimicry with humans.<sup>3</sup>

Mechanism of action of the ChAdOx1 nCoV-19 vaccine includes a modified version of a chimpanzee adenovirus, known as ChAdOx1 that has the ability to insert artificial DNA into human cells. The objective is to generate the synthesis of SARS-CoV-2 spike protein by the host cells, which will lead to activation of immune cells.<sup>4</sup> The existence of molecular mimicry between the vaccine-induced proteins of SARS-CoV-2 and human components might give rise to potential side effects by production of pathological autoantibodies. This may result in vaccine-induced autoimmunity especially in the presence of genetic disposition in a similar mechanism to the vaccine-induced thrombotic thrombocytopenia (Figure 2).<sup>3</sup>

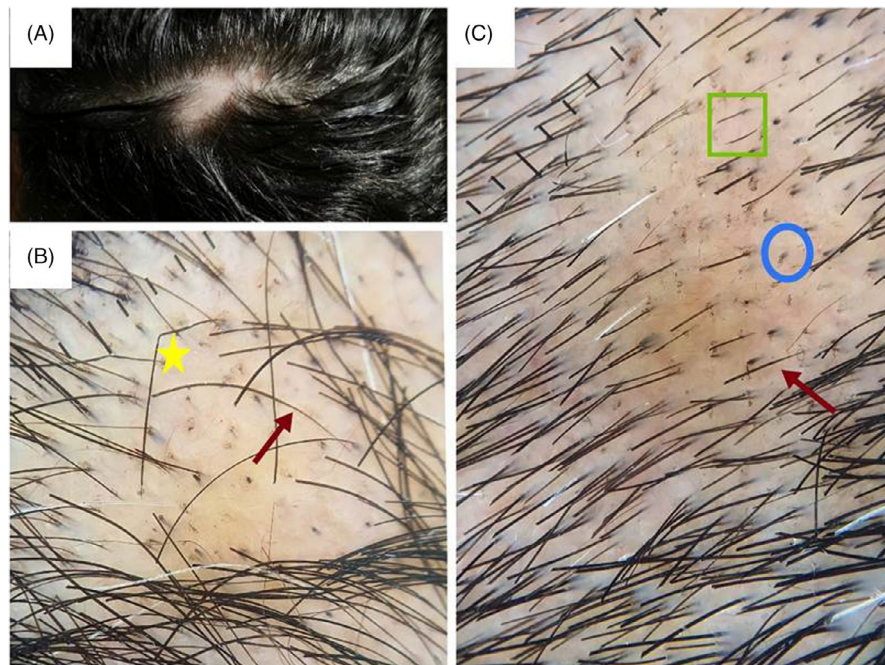
Up to our knowledge, this is the first case of AA reported after COVID-19 vaccination; however, it is not the first case described after vaccination. In 2016, Chu et al.<sup>5</sup> reported a case of recurrent AA after vaccination. The first episode occurred at age 27 months, approximately 1 week after the third dose of Japanese encephalitis vaccine, followed by complete regrowth in 6 months. The second episode developed within 3 days after the third dose of influenza vaccine at age 36 months as a recurrence of progressive hair loss. Similarly, Wise et al.<sup>6</sup> reported 60 cases of alopecia areata after immunization with zoster vaccination or quadrivalent human papillomavirus vaccination.

Autoimmune/ inflammatory syndrome induced by adjuvants (ASIA) is a syndrome that has been introduced, as multiple vaccines have been claimed as potential triggers for autoimmune diseases, mainly in genetically predisposed individuals. Adjuvants and vaccine antigens may evoke T cell-mediated immune reactions, which may trigger AA in genetically susceptible individuals (Figure 2).<sup>7</sup>

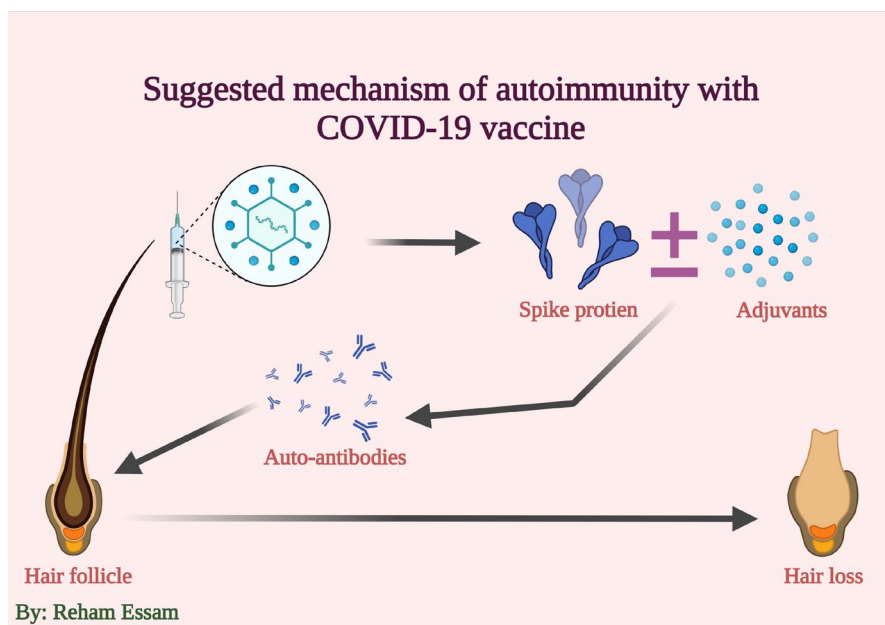
In conclusion, ChAdOx1 nCoV-19 vaccine (Oxford/AstraZeneca) was found to be safe and efficacious against symptomatic COVID-19 in large randomized controlled trials, but our report suggests its possible role in triggering AA in genetically predisposed patients through immune-mediated mechanisms.

## KEYWORDS

ChAdOx1 nCoV-19 vaccine, COVID-19, hair falling, SARS-CoV-2



**FIGURE 1** (A) Sharply demarcated bald patch on the scalp. (B & C) Trichoscopic examination showing black dots (blue circle), broken hairs (yellow asterisk), newly growing hairs (green square), and exclamation mark hairs (red arrows)



**FIGURE 2** Suggested mechanism of autoimmune-mediated alopecia areata following COVID-19 vaccine<sup>3,4,7</sup>: The existence of molecular mimicry between the vaccine-induced proteins of SARS-CoV-2 and human components might give rise to pathological autoantibodies. Adjuvants may have a role in the production of these autoantibodies. (Created with BioRender.com)

#### FUNDING INFORMATION

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#### CONSENT STATEMENT

A written consent was taken from the patient.

#### ETHICS STATEMENT

Authors declare human ethics approval was not needed for this study.

#### CONFLICT OF INTEREST

No conflict of interest.

#### AUTHOR CONTRIBUTIONS

Essam R. and Moustafa EA conceptualized and designed the work. Essam R., Ehab R., and Al-Razzaz R drafted the manuscript. Essam R., Moustafa EA., and Khater MW revised the manuscript. All authors contributed to acquisition, analysis, and interpretation of data, gave final approval of the manuscript, and agree to be accountable for all aspects of work ensuring integrity and accuracy.

#### DATA AVAILABILITY STATEMENT

Data is available upon request.

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