

## Alopecia Areata, COVID 19 Infection and Anti-COVID Vaccine: Possible Association!

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### 1. Abstract

Since the beginning of the pandemic, numerous skin manifestations associated with COVID-19 have been reported in the literature. However, phanerian manifestations remain rare. We report a case of rapid-onset of universal alopecia associated with nail involvement secondary to SARS COV 2 infection in a 46-year-old female patient, who subsequently developed a relapse after the COVID 19 vaccination despite continuing the treatment. The physiopathological mechanisms underlying the disorders in our patient remain unknown, making this virus even more mysterious and raising questions about the nature of its association with dermatologic, autoimmune, and autoinflammatory manifestations.

**2. Keywords:** COVID-19; Dermocorticoid; Physiopathological

### 3. Introduction

Since the beginning of the pandemic, numerous skin manifestations associated with COVID-19 have been reported, including autoimmune diseases such as alopecia. However, the relationship between alopecia and COVID-19 remains unclear. We report a case of universal alopecia secondary to SARS COV 2 infection, with relapse after COVID vaccination, trying to understand the pathophysiological mechanisms behind these disorders.

### 4. Case Report

A 46-year-old patient with a history of rheumatoid arthritis under salazopirine, a multihetero nodular goiter thyroidectomized in 2011, consulted for hair loss generalized to the whole body evolving for three months.

Clinical examination found non-scarring alopecia of the scalp and eyebrows, depilation of the entire body and eyelashes (Figure 1), and punctate nail depressions with a line of beau on the left 4th finger (Figure 2). Trichoscopy showed exclamation point hairs, white hairs, plicate hairs, and black dots (Figure 3). Skin biopsy showed five telogen-type follicles, some of which were miniaturized, dilatation of the hair ostium with a horny plug and a lymphocytic infiltrate around a hair bulb. The diagnosis of alopecia universalis was made. The thyroid test was normal, and the immunological test was negative.

Furthermore, the patient reported a notion of influenza-like illness two weeks before the onset of symptoms, and a notion of contact with COVID positive cases but a COVID PCR was not performed. We performed a COVID 19 serology test showing an old SARS COV 2 infection with positive Ig G at 13, 20. The patient was put on minoxidil, dermocorticoid, corticoid bolus, and SLE with good improvement and hair regrowth on the scalp, eyebrows, and eyelashes.

Three months later the patient was vaccinated against COVID 19, then one week after the 2nd dose the patient lost all the regrowth she had despite continuing the treatment.



**Figure 1:** Alopecia of the scalp and eyebrows



**Figure 2:** Pelagic nails



**Figure 3:** Trichoscopy of hair loss

## 5. Discussion

Many reports have debated the relationship between COVID-19 and several immune-related dermatologic conditions. However, rare cases have described the possible association between the new-onset alopecia and SARS-COV 2 infection [1-7].

Alopecia areata is an autoimmune inflammatory disease that can be caused by environmental factors in genetically predisposed patients such as stress, viral infection, vaccine, or hormonal disorders.

Stress is the most common etiological factor of alopecia areata. Thus, the occurrence of alopecia areata in patients with SARS-COV2 infection could indeed be a consequence of the psychological impact of this infection [8].

Moreover, the link between alopecia areata and viral infection has been suggested by many authors particularly CMV, EBV, and also with some vaccines including the HVB vaccine [9], which may explain the loss of regrowth in our patient after vaccination against SARS-COV 2 despite continued treatment.

Thus, the originality of our case is to describe the possible association between COVID 19 infection and alopecia areata on the one side, and between COVID 19 vaccine and alopecia areata on the other side.

Although there is no direct link established between alopecia areata and SARS COV2 infection, the very short time interval between them, and the relapse after COVID-19 vaccination would suggest a possible correlation between the two.

Indeed, alopecia areata may be secondary to the viral infection due to the antiviral response via interferon IFN and CMHI which are expressed at the proximal outer epithelial sheath which will trigger hair loss.

During SARS-COV 2 infection, there is an activation of the cytokine cascade, IFN, and other proinflammatory cytokines like interleukin IL6 that are increased also in alopecia areata [10]. IL6 inhibits the proliferation of follicular keratinocytes, and thus blocks the transition from the telogen to the anagen phase [11].

## 6. Conclusion

Alopecia areata may be a phanerian manifestation of SARS-COV 2 infection, which should be suspected in the abrupt and rapidly progressive alopecia areata. It is important to alert clinicians to the possible association between alopecia areata and SARS-COV 2 infection to adapt the treatment of alopecia, which is most often based on immunosuppressive drugs, and which are contraindicated during active infection with COVID 19. This being said, further studies are needed to elucidate the role of COVID 19 in the development of alopecia.

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