Journal of Vaccines, Immunology and Immunopathology
Almodayfer AO and Alruwaili MS. J Vaccines Immunol 9: 1120.
www.doi.org/10.29011/2575-789X.0001120
www.gavinpublishers.com

Case Report

Alopecia Universalis after COVID-19 Vaccination: Case Report and Literature Review

Arwa O. Almodayfer[1],Maram S. Alruwaili[2*]

[1]Department of Dermatology, King Saud Medical City, Riyadh, SAU

[2]College of Medicine, Jouf University, Sakaka, Aljouf, SAU

[*]**Corresponding author:** Maram S. Alruwaili, College of Medicine, Jouf University, Sakaka, Aljouf, SAU

Citation: Almodayfer AO, Alruwaili MS (2024) Alopecia Universalis after COVID-19 Vaccination: Case Report and Literature Review. J Vaccines Immunol 9: 1120. DOI: 10.29011/2575-789X.0001120

Received Date: 14 August 2024; **Accepted Date**: 21 August 2024; **Published Date**: 26 August 2024

Abstract

Alopecia areata (AA) is an autoimmune disease that affects hair follicles and thus causes hair loss. It typically occurs in patches on the scalp known as areata. However, AA can also lead to the complete scalp hair loss, known as alopecia totalis (AT), or the loss of both scalp and body hair, known as alopecia universalis (AU). We report the case of a 44-year-old female who experienced severe and rapidly progressive AU a were receiving a COVID-19 vaccine. This study looked to explore existing medical literature on the association between COVID-19 vaccines, AU, and AA, focusing on the timeline and clinical presentation of these conditions.

Keywords: Hair loss; Alopecia areata; COVID-19 vaccine; Autoimmune; Alopecia universalis

Introduction

Alopecia areata, an autoimmune-mediated disorder characterized by the disruption of hair follicle immune privilege, manifests as localized patches of no scarring hair loss. However, in its most severe manifestations, the condition can involve to alopecia totalis (AT), characterized by complete alopecia of the scalp, or alopecia universalis (AU), entailing the absence of hair across the entirety of the body [1].

Characterized by complete hair loss across the entire body, AU represents a severe manifestation of alopecia areata (AA), a T-cell-mediated autoimmune disorder that targets hair follicles [2]. AA exhibits a well-established association with various viral infections and diseases. Numerous investigations have looked into the complex connection between AA and viral pathogens, revealing that coronavirus disease 2019 (COVID-19) can trigger the onset, exacerbation, or recurrence of AA in individuals with a history of COVID-19 infection [3].

This study presents the case of a 44-year-old female with a medical history of well-controlled hypothyroidism (20 years on levothyroxine) who presented with rapidly progressive AU within 2 weeks of the COVID-19 vaccine.

This study investigated severe-onset AU and AA as potential side effects of COVID-19 vaccines with a focus on the timeline of these conditions and their clinical presentation through a literature review.

Case Presentation

We encountered a 44-year-old female with a medical history of well-controlled hypothyroidism (20 years on levothyroxine). Otherwise, she had no past medical or family history of AA or other autoimmune or dermatologic diseases. Upon initial exposure to the COVID-19 vaccine (AstraZeneca) in March 2021, the patient exhibited minimal adverse reactions. Subsequent administration of the COVID-19 vaccine in July 2021 utilized the Pfizer formulation, which was also tolerated without significant sequelae. She was doing well until 3-4 days later, when she started to have sudden, rapidly progressive hair loss resulting in complete alopecia within 2 weeks, as shown in (Figure 1-3).

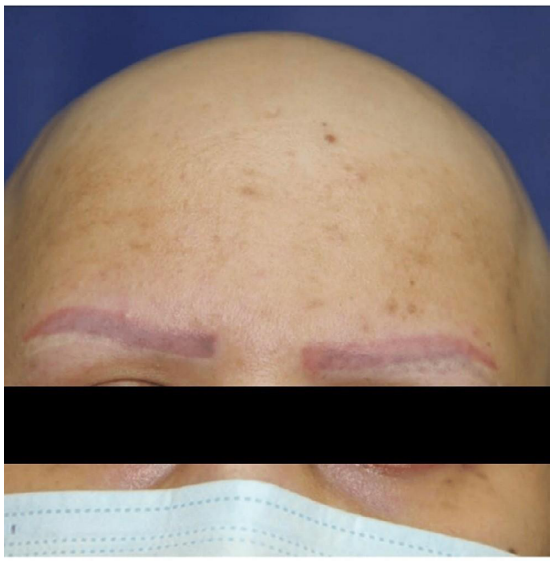

Figure 1: Frontal view of scalp show complete hair loss within weeks of COVID-19 vaccine.

Figure 2: Occipital view of scalp.

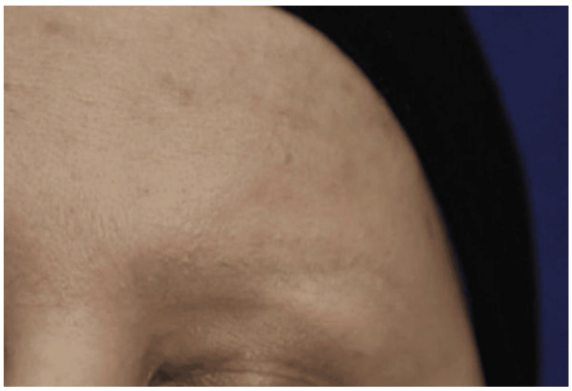

Figure 3: Alopecia.

She sought medical affinition at our institute in March 2022. Physical examination showed a 44year-old fair and overweight lady with complete alopecia over the scalp, face (including eyebrows and eyelashes), and the rest of the body. Nails were normal with no paging. She was diagnosed clinically with AU. She scored 100% on the Severity of Alopecia Tool (SALT), which is very severe.

We discussed treatment options with her and decided to start methotrexate and mini-pulse dexamethasone, stating that if no improvement were seen in 3 months, we would consider switching to to facitinib. A comprehensive medical evaluation was conducted, encompassing a thorough hematological assessment via complete blood count, an evaluation of hepatic function through liver function tests, a renal profile to assess kidney function, a lipid profile to evaluate blood fat levels, fasting blood sugar determination to assess glycemic control, HbA1c testing to gauge long-term glycemic control, QuantiFERON-TB Gold testing for latent tuberculosis infection, a chest X-ray, and serological testing for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) All laboratory findings were within normal ranges and unremarkable.

We started with 0.1 mg/kg dexamethasone (11 mg) on two consecutive days weekly and 7.5 mg methotrexate weekly. Her scalp hair started to regrow within 1 month, and she was tolerating the medication with minimal gastritis that improved with lifestyle modifications. One year later, the patient was very satisfied, as there was complete regrowth of the scalp, eyebrows, eyelashes, and body hair, as shown in (Figure 4).

Figure 4: Complete hair growth of scalp, eyebrows, eyelashes and body hair.

Since starting therapy, we managed to taper dexamethasone and increase the dose of methotrexate gradually to maintain efficacy and minimize side effects.

Currently, she is on 0.04 mg/kg dexamethasone, 12.5 mg methotrexate, and folic acid 5 mg weekly with complete hair growth. We plan to taper off dexamethasone completely and continue on methotrexate and folic acid. If the patient maintains an optimal response for 2 months, we plan to taper off methotrexate gradually and monitor her response. If the patient starts losing efficacy with tapering, we will consider showing the patient to JAK inhibitors (Table 1).

Interval between alopecia and vaccination	Outcome	Treatment	Alopecia presentation	Type ofSARS-CoV-2 -Vaccine	No of patients	Year	Study	
3-4 days after 2nd dose of vaccine	Hair Regrowth	Mini-pulse dexamethasone and methotrexate	AU	1st Dose AstraZeneca 2nd dose Pfizer	1	2023	Almodayfer et al.	1
1 week to 4 months after vaccination	Not Reported	Tofacitinib citrate 5 mg- Tofacitinib citrate 5 mg Tofacitinib citrate10 mg, Bimatoprost 0.03% eye drops- Tofacitinib citrate 10 mg Intralesional triamcinolone Tofacitinib citrate 10 mg- Intralesional triamcinolone – Scheduled for oral tofacitinib- Tofacitinib citrate 10 mg	AA	Moderna- - Pfizer - Moderna - Pfizer Pfizer- - Moderna - Pfizer - Pfizer - Pfizer	- F/33 - F/57 - F/ 62 - F/ 28 - F/ 29 - M/ 22 - M/ 15 - M/ 61 - M/ 16	2021	Scollan et al.	2
1 week to 3 weeks after vaccination	No benefit, can be attribute d to short follow- up	Minoxidil 5%, topical clobetasol, topical growth factor, intralesional triamcinolone	AA	-Moderna - Moderna - Pfizer - Pfizer - Moderna	-F/25 - F/23 - F/ 32 M/ 31 M/ 51	2023	Genco et al.	3
3 weeks after 2nd dose	Not Reported	Not Reported	AA	Pfizer	1	2022	Gallo et al.	4

Table 1: Demographics, medical history, SARS-CoV-2 vaccine administra8on, approximate 8meframe between receiving vaccine and experiencing hair loss treatment.

Discussion

A is an autoimmune disease that causes hair loss without scarring. The exact cause of the disease is not known [4].

This case report looked into the extant medical literature to illuminate the potential role of COVID-19 vaccines in the pathogenesis of AA. A female patient enrolled in the study developed severe AU approximately one month following the administration of the second COVID-19 vaccine dose.

Talofa suggested that COVID-19 vaccines might activate immunological events that can lead to an abnormal autoimmune response in certain people [5]. These mRNA and adenovirus vector vaccines initiate a cascade of immunological events by introducing the gene encoding the SARSCoV-2 spike protein, which orchestrates the production of antibodies and the activation of Th1 cells, culminating in the release of proinflammatory cytokines [5]. This process could potentially explain the development of autoimmune diseases like AA. Ho et al. presented a case similar to ours of a 51-year-old Afro-Caribbean woman with rapid AU within 3 weeks of receiving her very first dose of the COVID-19 vaccine, except for one small patch on the back of her head. She received a 2nd dose of the vaccine 8 weeks later, and the remaining patch of hair was lost within 1 week [6].

A subsequent study documented an incident of alopecia areata, a condition characterized by non-scarring hair loss, in a 31-year-old male patient following the administration of the second dose of the Pfizer-BioNTech COVID-19 vaccine. Three weeks post-vaccination, the patient presented to a dermatology clinic with circular patches of alopecia affecting the occipital, bilateral parieto-temporal, and frontal regions of the scalp, accompanied by alopecia barbae (beard loss) [7].

Scollan et al. described nine cases of AA occurring aware individuals received a vaccination for the SARS-CoV-2 [8].

Genco et al. reported five cases of AA occurring aware COVID-19 vaccination. Patients experienced a temporary worsening of the disease aware the first vaccine dose but remained stable with subsequent doses. One patient experienced a "booster effect" where the disease worsened progressively with each vaccine booster [9].

Conclusion

The case report and literature review suggest that COVID-19 vaccines may be linked to AU regardless of whether patients have a history of AA. The precise process and causal connection between vaccinations and AU remain unknown. However, further studies are required to fully understand this association and determine the relevant risks.

Ethical Considerations

Informed consent was obtained from all study participants, in accordance with the principles of the Declaration of Helsinki.

Conflicts of Interest

In accordance with the ICMJE uniform disclosure form, all authors affirm the following.

Financial Support

No external funding was received for this study.

Financial Relationships

All authors declare no relevant financial affiliations within the past three years with any entities that may have an interest in the presented work.

Other Disclosures

No other relationships or activities exist that could be perceived to have influenced the findings of this research.

References

1. S Kassira, DZ Korta, LW Chapman, F Dann (2017) Review of treatment for alopecia totalis and alopecia universalis. International Journal of Dermatology. 56: 801-810.
2. MK Hordinsky, (2013) Overview of alopecia areata. (in eng), J Investing Dermatol Symp Proc. 16: S13-S15.
3. RE Christensen, M Jafferany, (2022) Association between alopecia areata and COVID-19: A systematic review. (In eng), JAAD Int 7: 57-61.
4. A Alkhalifah, A Alsantali, E Wang, KJ McElwee, J Shapiro, (2010) Alopecia areata update: part I. Clinical picture, histopathology, and pathogenesis. (in eng), J Am Acad Dermatol 62: 177-88, quiz 189-90.
5. R Taloaa, (2021) Do COVID-19 RNA-based vaccines put at risk of immune-mediated diseases. In reply to "potential antigenic cross-reach vity between SARS-CoV-2 and human issue with a possible link to an increase in autoimmune diseases". (in eng), Clin Immunol. 108665.
6. JD Ho, A McNish, L McDonald, C Burrell, S Smith-Maahews, (2022) Alopecia universalis with unusual histopathologic features afer vaccination with ChAdOx1 nCoV-19 (AZD1222). (in eng), JAAD Case Rep. 25: 4-8.
7. G Gallo, L Mastorino, L Tonella, S Ribero, P Quaglino, (2022) Alopecia areata after COVID-19 vaccination. (in eng). Clin Exp Vaccine Res. 129-132.
8. ME Scollan, A Breneman, N Kinariwalla, Y Soliman, S Youssef, et al. (2022) Alopecia areata after SARS-CoV-2 vaccination. (in eng), JAAD Case Rep. 20: 1-5.
9. L Genco, M Cantelli, M Noto, T Baksta, A Patrì, et al. (2023) Alopecia Areata after COVID-19 Vaccines. (in eng), Skin Appendage Disord. 9:141-143.