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# Prevalence of Hair Loss in Egyptian People After COVID-19 Vaccination

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## Abstract

**Background:** Coronavirus disease 2019, currently named SARS-CoV-2 is a contagious disease caused by a coronavirus the illness that the World Health Organization considers to be a pandemic worldwide. In Egypt, over 288 thousand COVID-19 confirmed cases with about 16.676 thousand total deaths until Aug 2021; COVID-19 vaccination can cause several adverse events, including hair loss, however, there are incompatible data are present on the possible relationship among COVID-19 vaccines and hair loss.

**Aim and objectives:** Our aim is to study and evaluate the prevalence of hair loss confirmed by dermoscope in Egyptian people after covid-19 vaccination.

**Patient and methods:** This prospective study included two thousand participants aged 20–60 years old and received COVID-19 vaccination during the period of January 2022 to July 2022 from the outpatient clinics of the dermatology and venereology departments, Al-Azhar University Hospitals.

**Result:** The findings in this study reported that among the studied cases the predominant vaccination drug was AstraZeneca vaccine with 524 (26.2%) cases, however, (1.6%) received Johnson & Johnson vaccine, (0.6%) received the Moderna vaccine, (3.4%) received Pfizer vaccine, (23.8%) received Sinopharm vaccine, (20.8%) received Sinovac vaccine, (19.0%) received Sputnik vaccine and (4.5%) received Sputnik light vaccine. 478 cases (23.9%) complained of hair loss and 1522 cases (76.1%) did not complain of hair loss after COVID-19 vaccination.

**Conclusion:** Covid-19 vaccination should be considered as a potential cause of hair loss.

**Keywords:** COVID-19, Hair loss, Vaccination

## 1. Introduction

Coronavirus disease 2019 (COVID-19), currently named SARS-CoV-2 is a contagious disease resulting from a coronavirus, the illness that the World Health Organization considers to be a pandemic worldwide on March 3rd, 2020.<sup>1</sup> In Egypt, over 288 thousand COVID-19 confirmed cases with about 16.676 thousand total deaths until Aug 2021, The Egyptian Health Ministry enrolled different types of COVID-19 vaccine, the available vaccines in Egypt are Sputnik V, Sputnik light, Pfizer, Sinopharm, AstraZeneca, Johnson & Johnson, Sinovac & Moderna.<sup>2</sup>

True diagnosis and evaluation of hair loss are crucial since it is a common complaint in dermatology

clinics. Many patients with hair loss, particularly female patients, perceive it to be a severe issue that causes discomfort and has a negative impact on their activities.<sup>3</sup> Hair loss may be diffuse or localized diffuse as androgenic alopecia and telogen effluvium localized as Alopecia areata, also they may be classified as cicatricial or non-cicatricial.<sup>4</sup>

Trichoscopy (dermoscope of hair and scalp) is a noninvasive diagnostic technique used in evaluation of hair loss beside other diagnostic techniques as pull test and trichogram that makes it possible to identify morphologic structures that are invisible to the naked eye. Trichoscopy is helpful for identifying and monitoring hair and scalp diseases. Dermoscopy help dermatologists to make a true diagnosis of different type of hair loss.<sup>5</sup>

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The study goal is to evaluate the prevalence of hair loss confirmed by dermoscopy in Egyptian people after covid-19 vaccination.

## 2. Patients and methods

Two thousand participants in the study were recruited from the dermatology and venereology departments' outpatient clinics, Al-Azhar University Hospitals.

### 2.1. Inclusion criteria

Age: 20–60 years old and have received COVID-19 vaccination in last six months.

### 2.2. Exclusion criteria

Patients with thyroid disorders, chronic debilitating diseases, autoimmune diseases that may cause hair loss.

All patients were subjected to the following: obtaining a history that places a focus on hair loss following COVID-19 immunization, obtaining a history of COVID-19 that details its start, course, length, and severity as well as how often it causes hair loss, the type of vaccine used, the dosage schedule, and any hair loss-related information.

After the first, third, and sixth months, cases are evaluated using dermoscopy and trichoscopy in addition to general and local hair examination.

## 3. Results

During the period of January 2022 to July 2022, Two thousand participants who received COVID-19 vaccination were evaluated, 1960 of the studied cases had not Previous COVID-19 infection, there were wide discrepancy in vaccination type, the predominant type of vaccine was AstraZeneca vaccine with (26.2%) vaccinated participants, and rest of participants received vaccination as follows: (1.6%) Johnson & Johnson vaccine, (6%) Moderna vaccine, (3.4%) Pfizer vaccine, (23.8%) Sinopharm vaccine, (20.8%) Sinovac vaccine, (19.0%) Sputnik vaccine and (4.5%) received Sputnik light vaccine (Tables 1 and 2).

Adverse events of COVID vaccination showed that fatigue was the most comment side effect encountered in our patient with 89% suffered from it. Moreover, (9.2%) of cases complained of scalp dysesthesia and 23.9% suffered from hair loss (Table 3).

Table 1. Age distribution among the study population.

Age (years)	Study group (n = 2000)
(Mean ± SD)	30.77 ± 7.54
Median (Min-Max)	28.5 (21–54)

Table 2. Vaccination types of our participants.

Vaccine	Study group (n = 2000)	
	Frequency	Percent
AstraZeneca	524	26.2%
Johnson & Johnson	32	1.6%
Moderna	12	0.6%
Pfizer	68	3.4%
Sinopharm	476	23.8%
Sinovac	416	20.8%
Sputnik	380	19.0%
Sputnik light	90	4.5%

Among the studied participant, the course of hair loss (exacerbate, improve or no change) at the 1st, 3rd & 6th month in each covid-19 vaccine was statistically significant  $P$  value = 0.001 (Tables 4 and 5 and Figs. 1–6).

## 4. Cases

Case (1) AstraZeneca vaccine (Fig. 7).

Clinical image (A) shows diffuse shedding of hair in the frontal, vertical areas of the scalp.

Dermoscopy images (B, C, D) show increase proportion of single hair follicle units & <20% hair diameter diversity and the same findings in the occipital area as seen in (E) which are suggestive for Telegon Effluvium.

(Dermalite 4, 3 G, Magnification 10<sup>X</sup>).

Case (2) Pfizer vaccine (Fig. 8).

Clinical image (A) shows localized shedding of hair in the frontal area of the scalp surrounded by preserved hair.

Dermoscopy images: (B,C,D) show presence of black dots (blue circles) & broken hairs (red circle) which suggestive for alopecia areata.

(Dermalite 4, 3 G, Magnification 10<sup>X</sup>).

## 5. Discussion

The COVID-19 pandemic's etiological agent, SARS-CoV-2, has created a global health emergency. Although COVID-19 dermatologic signs have been recorded, skin-related rather than hair-related manifestations have received far greater attention.<sup>6</sup>

Table 3. Post Covid-19 vaccine complications among the study group.

	Study group (n = 2000)	
	Frequency	Percent
Fatigue	1780	89.0%
Malaise	80	4.0%
Both (Fatigue & Maliase)	140	7.0%
Scalp Dysesthesia	124	6.2%
Fever	1764	88.2%

Table 4. Prevalence of hair loss among our cases according to the type of hair loss after different covid-19 vaccination.

Vaccine	Acute TE	ExacerbationAGA	New A. A	Overlap AGA and TE	Recurrent A. A
Astrazeneca <i>n</i> = 164	139 (84.8%)	1 (0.6%)	12 (7.3%)	8 (4.9%)	4 (2.4%)
Johnson & Johnson <i>n</i> = 4	4 (100%)	0	0	0	0
Moderna <i>n</i> = 2	2 (100%)	0	0	0	0
Pfizer <i>n</i> = 12	4 (33.3%)	0	4 (33.3%)	4 (33.3%)	0
Sinopharm <i>n</i> = 116	96 (82.8%)	4 (3.4%)	8 (6.9%)	0	8 (6.9%)
Sinovac <i>n</i> = 92	72 (78.3%)	4 (4.3%)	12 (13.0%)	0	4 (4.3%)
Sputnik <i>n</i> = 68	52 (76.5%)	4 (5.9%)	4 (5.9%)	4 (5.9%)	4 (5.9%)
Sputnik light <i>n</i> = 20	20 (100.0%)	0	0	0	0
Total	389	13	40	16	20
Chi square test	$\chi^2 = 74.7, P \text{ value} < 0.001$				

Skin involvement has been one of the most common presentations in SARS-CoV-2 infected patients, along with respiratory and gastrointestinal manifestations.<sup>7</sup>

The possibility of immune-related adverse effects in susceptible people has not yet been proven. On the other hand, some reports seem to indicate that hair loss, including the reappearance of alopecia areata and an aggravation of androgenic alopecia.<sup>8</sup>

Two thousand patients were involved in this study with mean age of 30.77 ( $\pm 7.54$  SD) with range (21–54) years. There were balanced population between male & female (58.3%) were males and (41.7%) were females.

Females made up the majority of the participants (90.3%), according to Alharbi,<sup>9</sup> the largest age group

(51.9%) was those aged 21 to 30, followed by those aged 31–40 years (33.4%), over 40 years (8.4%), and 20 years or less (6.3%). In our study, the predominant type of vaccine was AstraZeneca vaccine with (26.2%) vaccinated participants, and rest of participants received vaccination as follows: (1.6%) Johnson & Johnson vaccine, (0.6%) Moderna vaccine, (3.4%) Pfizer vaccine, (23.8%) Sinopharm vaccine, (20.8%) Sinovac vaccine, (19.0%) Sputnik vaccine and (4.5%) received Sputnik light vaccine. 352 (17.6%) who received 1st dose of covid-19 vaccines and 1648 cases (82.4%) who received 1st & 2nd dose of covid-19 vaccines.

In the study of Birkett et al.<sup>10</sup> reported that 10% of patients received the mRNA-1273 Moderna (Cambridge, MA) vaccine, 40% received the AstraZeneca,

Table 5. Distribution of studied cases according to course of hair loss at 1st, 3rd &amp; 6th month.

Vaccine	Study group ( <i>n</i> = 2000)	Study group ( <i>n</i> = 2000)		
		1st month	3rd month	6th month
Astrazeneca <i>n</i> = 524	Exacerbate	164 (31.3%)	8 (1.5%)	–
	No change	360 (68.7%)	360 (68.7%)	360 (68.7%)
	Improve	–	156 (29.8%)	164 (31.3%)
Johnson & Johnson <i>n</i> = 32	Exacerbate	4 (12.5%)	–	–
	No change	28 (87.5%)	28 (87.5%)	28 (87.5%)
	Improve	–	4 (12.5%)	4 (12.5%)
Moderna <i>n</i> = 12	Exacerbate	2 (16.7%)	–	–
	No change	10 (83.3%)	10 (75%)	10 (75%)
	Improve	–	2 (25%)	2 (25%)
Pfizer <i>n</i> = 68	Exacerbate	4 (5.9%)	–	–
	No change	64 (94.1%)	64 (94.1%)	64 (94.1%)
	Improve	–	4 (5.9%)	4 (5.9%)
Sinopharm <i>n</i> = 476	Exacerbate	116 (24.4%)	4 (0.8%)	–
	No change	360 (75.6%)	360 (75.6%)	360 (75.6%)
	Improve	–	112 (23.5%)	116 (24.4%)
Sinovac <i>n</i> = 416	Exacerbate	92 (22.1%)	4 (1%)	–
	No change	324 (77.9%)	324 (77.9%)	324 (77.9%)
	Improve	–	88 (21.2%)	92 (22.1%)
Sputnik <i>n</i> = 380	Exacerbate	68 (17.9%)	–	–
	No change	312 (82.1%)	312 (82.1%)	312 (82.1%)
	Improve	–	68 (17.9%)	68 (17.9%)
Sputnik light <i>n</i> = 92	Exacerbate	20 (21.7%)	–	–
	No change	72 (78.3%)	72 (78.3%)	72 (78.3%)
	Improve	–	20 (21.7%)	20 (21.7%)
Statistics	$\chi^2 =$	39.37	43.7	39.37
Chi square test	<i>P</i> -value	<0.001	<0.001	<0.001

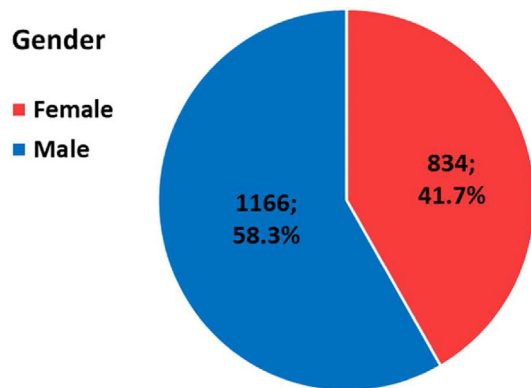


Fig. 1. Gender distribution among the study population.

and 50% received the BNT162b2 Pfizer/BioNTech (New York, NY) vaccine.

Also, In Saudi Arabia in July 2021, Alharbi<sup>9</sup> carried out a cross-sectional study. Adults who got a recognized COVID-19 vaccine were asked to complete a questionnaire, regardless of prior COVID-19 infection Pfizer vaccines were used the most frequently (82.2%), followed by AstraZeneca

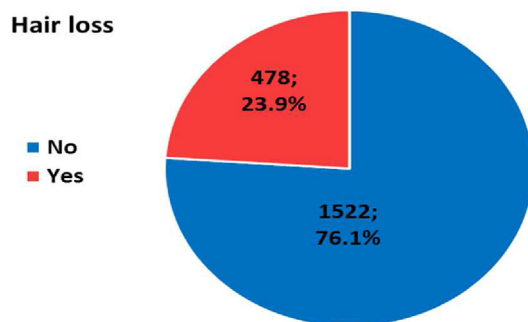


Fig. 2. Prevalence of hair loss among our participants.

(13.7%), and a combination of Pfizer and AstraZeneca (2.5%).

Our finding showed that among the studied hair loss cases 478 cases 23.9% complain of hair loss and 1522 cases 76.1% not complain of hair loss. Hair loss and Covid 19 immunization were significantly related.

Magadmi & Kamel<sup>11</sup> revealed that stress and fear associated with vaccinations may be more likely to cause postvaccination hair loss than the actual vaccine itself. In Saudi Arabia, receiving a COVID-19 vaccination was met with a significant amount of hesitation, misinformation, and fear.

In agreement with us, Jeřkowiak<sup>12</sup> found that around 28% of individuals who experienced postvaccination hair fall also reported a decrease in pre-vaccination hair fall and suspected pre-vaccination hair fall-related disorders, which is consistent with our findings. Postvaccination hair loss has been reported in 1.0–1.5% of COVID-19 vaccine users.

Aryanian et al.<sup>13</sup> highlight the potential role of the COVID-19 vaccination as a cause of hair loss. Although the condition is usually self-limiting, patient reassurance is critical in order to reduce the psychological concerns that might lead to a vicious cycle of hair loss.

In this study, there were 478 hair loss cases 23.9% exacerbate during the 1st month of vaccination & 1522 cases 76.1% has no hair affection, patients received the treatment to each type of hair loss according to dermatological guide lines. There were 462 cases improve but there were 16 hair loss cases still not improve at 3rd month of onset but all cases show improvement at 6th month.

The same as our findings, Alhazmi et al.<sup>14</sup> indicated that 84% of persons reported adverse effects

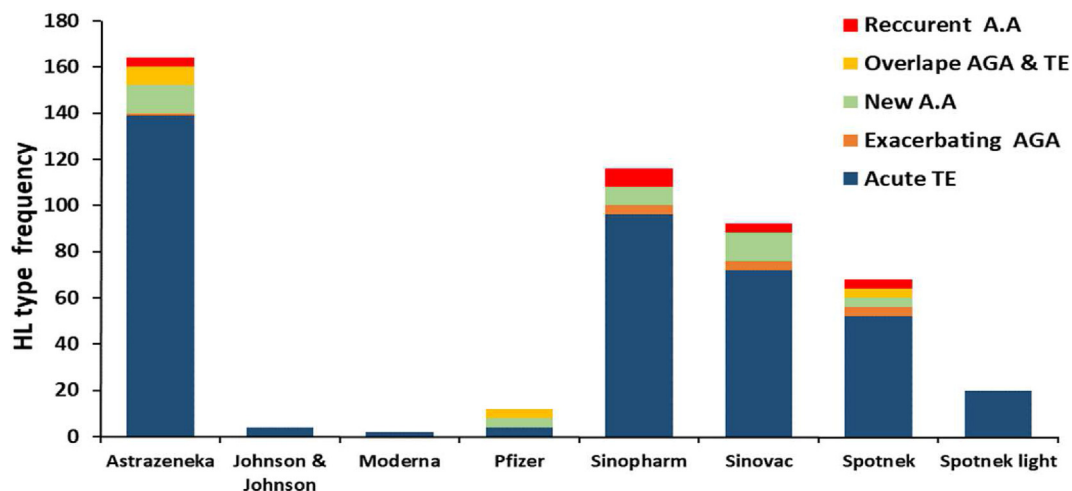


Fig. 3. Distribution of studied hair loss cases according to type of hair loss after covid-19 vaccination.

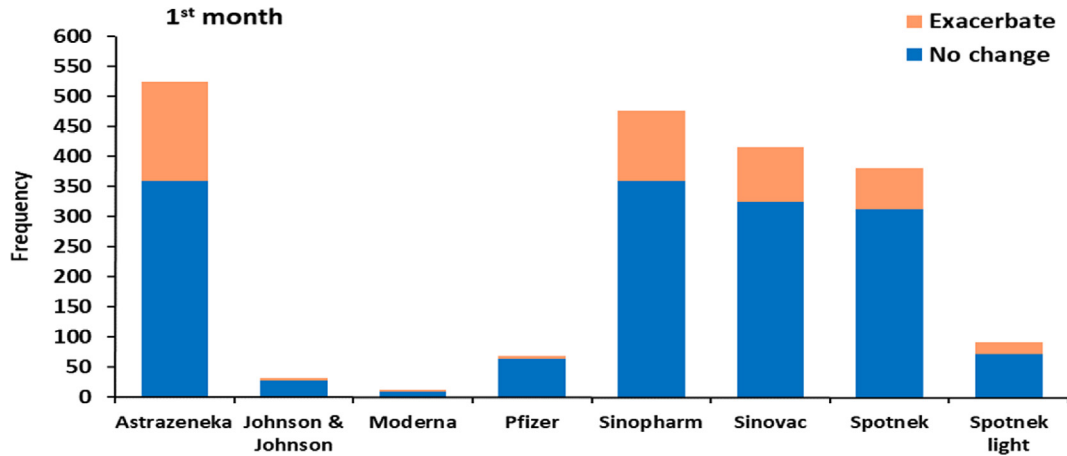


Fig. 4. Distribution of studied cases according to course of hair loss at 1st month.

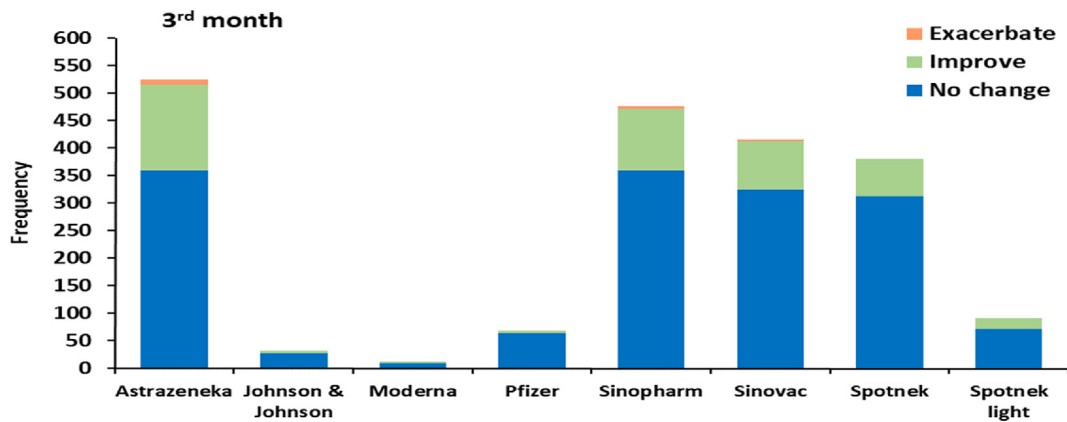


Fig. 5. Distribution of studied cases according to course of hair loss at 3rd month.

on the day they received the vaccine, whereas 15% began to detect such side effects on the second day and 1% on the third day postvaccination.

Our study revealed that Acute TE was the most common postvaccination hair loss with percentage 19.5% of patients (389 cases) postCOVID-19 vaccination, acute TE occurred earlier than classic acute TE (within 1 month after vaccination).

Our findings found that 13 cases (0.7%) Exacerbating AGA, 40 cases (2.0%) Newly discovered A.A, 16 cases (0.8%) Overlap AGA & TE, 20 cases (1.0%) Recurrent A.A.

In the manner of our findings, Wambier et al.<sup>15</sup> found alopecia areata and telogen effluvium were discovered to be the most common kinds of hair loss in the COVID-19 environment; however, frictional alopecia and pressure-induced alopecia were also reported. Androgenetic alopecia, commonly known as the Gabrin sign, is regarded to be a risk factor for the severity of COVID-19 rather than a complication.

Conforming to us Lee et al.<sup>16</sup> reported that alopecia areata and, to a lesser extent, alopecia universalis have been linked to the administration of COVID-19 vaccinations in a few recent case reports. It has been linked to an autoimmune response to the vaccine's adjuvants or component parts.

In another study conducted by Rossi et al.,<sup>17</sup> increasing number of cases of hair loss following SARS-CoV-2 vaccination are being documented in the United States and internationally. There were 915 cases of alopecia were found in the Centers for Disease Control and Prevention's Vaccine Adverse Event Reporting System database, 67 of AA, 1 of alopecia totalis, and 8 of alopecia universalis to date associated with the Pfizer or Moderna vaccines.

Rossi et al.,<sup>17</sup> released a study from Italy describing 2 cases of AA recurrence after AZD1222/ChAdOx1 nCoV-19 vaccine (Oxford/AstraZeneca) and 1 case of AA recurrence with Pfizer messenger RNA vaccine.

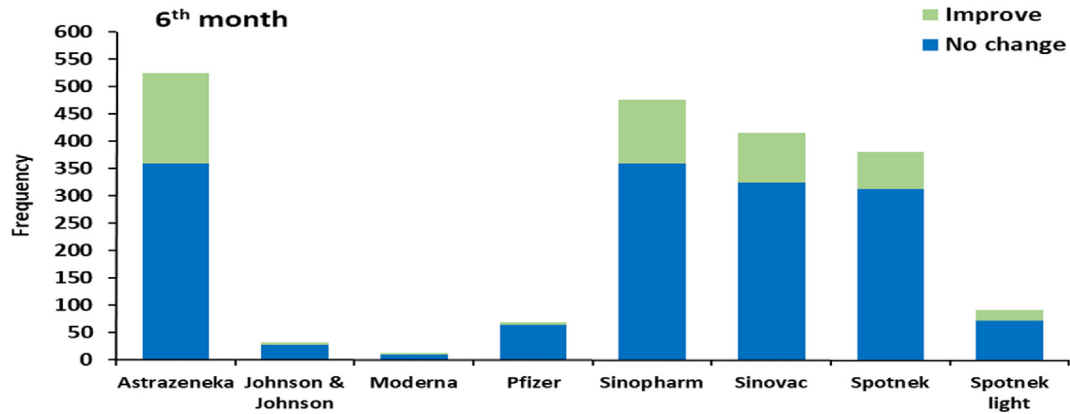


Fig. 6. Distribution of studied cases according to course of hair loss at 6th month.

Another study from Essam et al.<sup>18</sup> also reported recurrent AA in a middle-aged woman following immunization with the AstraZeneka vaccine after a prolonged remission from the disease. Additionally,

AA cases in children and adults have been reported following various standard vaccines.

Our results showed that among the studied cases there were 524 who received AstraZeneka vaccine,

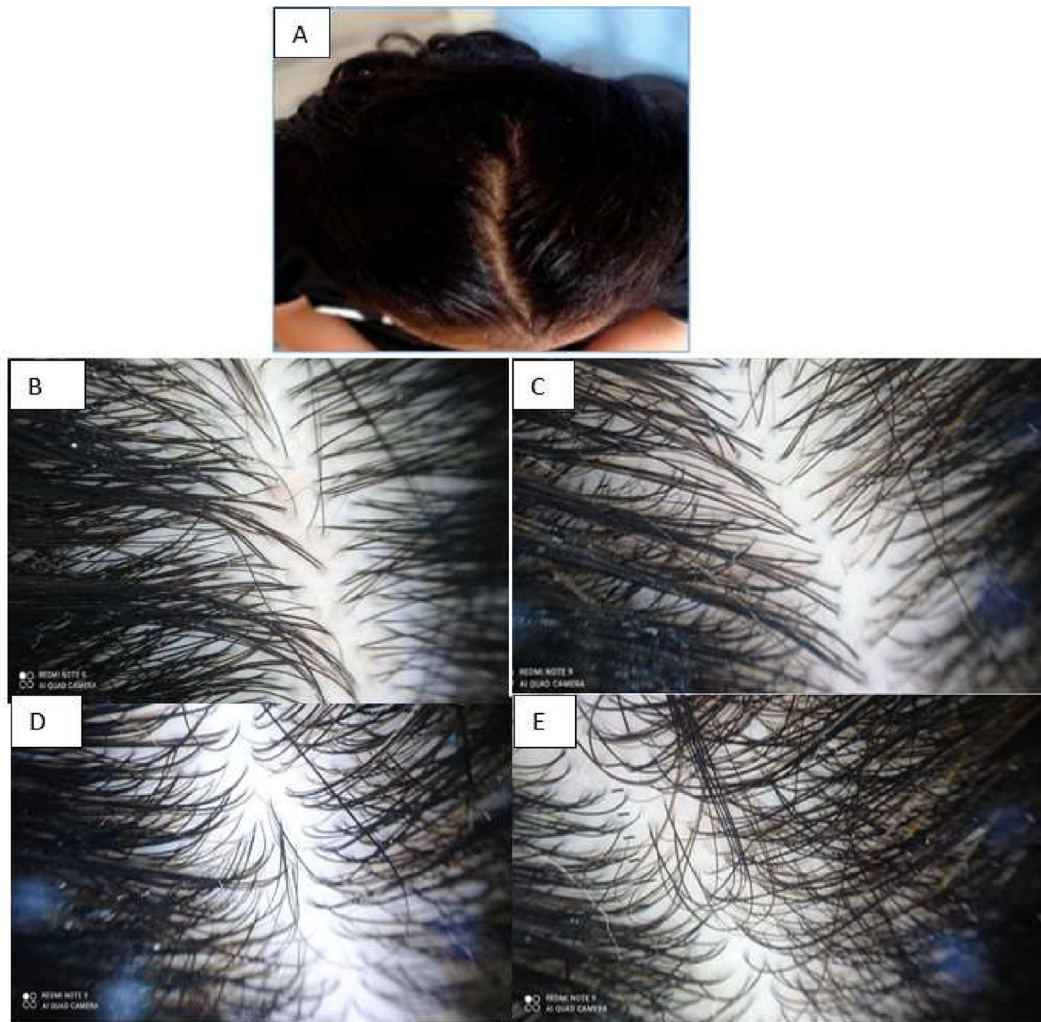


Fig. 7. Female patient 22 years old complaining of diffuse hair loss of 2 months duration after 2nd dose vaccination.

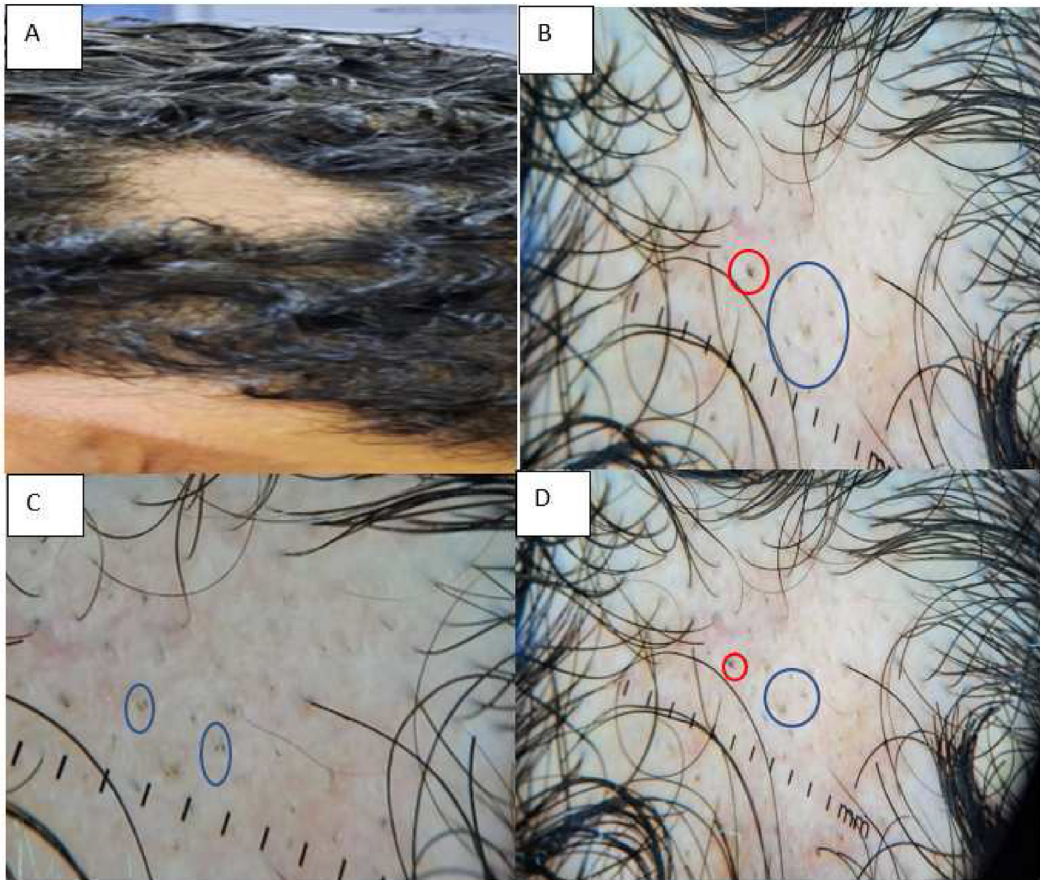


Fig. 8. Male patient 30 years complaining of localized hair loss of 3 months duration after 2nd dose of vaccination.

460 cases (87.8%) with fatigue & 8 cases (1.5%) with malaise, 56 cases (10.7%) with both fatigue & malaise, there were 32 cases who received Johnson & Johnson vaccine, 28 cases 87.5% with fatigue & 4 cases 12.5% with malaise, there were 12 cases who received Moderna vaccine 8 cases 66.7% with fatigue & 4 cases 33.3% with malaise, there were 68 cases who received Pfizer vaccine 44 cases 64.7% with fatigue & 24 cases 35.3% with malaise, there were 476 who received Sinopharm vaccine, 392 cases (82.4%) with fatigue & 20 cases (4.2%) with malaise, 64 cases (13.4%) with both fatigue & malaise, there were 416 cases received Sinovac, 412 cases (99%) with fatigue & 4 cases (1%) with both Fatigue & Malaise, there were 380 cases who received sputnik vaccine, 344 cases (90.5%) with fatigue &, 20 cases (5.3%) with malaise, 16 cases (4.2%) with fatigue malaise, there were 92 cases received Sputnik light vaccine, and all cases 100% with fatigue.

The same as our results, Polack et al.<sup>19</sup> and Voysey et al.<sup>20</sup> revealed that headache (62%), fever (66%), and soreness at the injection site (85%), together with fatigue (90%), were the most common adverse effects.

According to Alhazmi et al.,<sup>14</sup> the most generally reported side effects among our study participants

were weariness and discomfort at the injection site (90% and 85%, respectively). They discovered that the Oxford-AstraZeneca vaccine was more strongly related with weariness and fever (92% and 71%, respectively) than the Pfizer-BioNTech vaccine, which showed 77% and 44%, respectively. Other side effects, on the other hand, showed no discernible change.

Funk et al.<sup>21</sup> found that, as compared to those who received the Pfizer-BioNTech vaccination, those who received the Oxford-Astra Zeneca vaccine had a greater risk of experiencing systemic adverse symptoms such as tiredness and fever.

Unlike other studies, Menni et al.<sup>22</sup> and El-Shitany et al.<sup>23</sup> found that majority of the participants in their study complained of being exhausted and having headaches; this is primarily caused by our participants' younger age (median is 26 years), compared to other studies' findings.

### 5.1. Conclusion

We found a high rate of post-vaccination hair loss after COVID-19 immunizations, which was validated by dermoscopy. Infection with COVID-19,



as well as stress caused by infection and immunization, cannot be ruled out. Covid-19 immunization, according on our findings, should be recognized as a possible cause of hair loss. The most prevalent kind of hair loss observed with COVID-19 vaccinations was TE with earlier onset than classic TE, although it was milder and shorter in duration, with a significantly better and more favorable prognosis. Aside from its noninvasive nature, dermatoscopy provides a wide range of options for confirmation and diagnosis of hair disorder.

## Disclosure

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## Conflicts of interest

No conflicts of interest.

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