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Hayder Wadood Majeed
Baghdad-Al Rusafa Health
Directorate, Ministry of
Health, Iraq

Israa Hasan Nader
Baghdad-Al Rusafa Health
Directorate, Ministry of
Health, Iraq

Nada Musaab Abbas
Nutrition Research Institute,
Public Health Directorate,
Ministry of Health, Iraq

Tamara Riyadh Al-Rudaini
Baghdad Medical Collage,
Ministry of Higher Education,
Iraq

Corresponding Author:
Hayder Wadood Majeed
Baghdad-Al Rusafa Health
Directorate, Ministry of
Health, Iraq

Investigating self-reported hair loss following covid-19 infection in the Iraqi population

Hayder Wadood Majeed, Israa Hasan Nader, Nada Musaab Abbas and Tamara Riyadh Al-Rudaini

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Abstract

Background: Hair loss is a growing concern reported by many individuals recovering from COVID-19 infection. This phenomenon, known as post-COVID hair loss, can be a significant source of distress. This cross-sectional study investigates the prevalence and characteristics of self-reported hair loss following COVID-19 infection in the Iraqi population.

Methods: This cross-sectional study (April-June 2023) investigated hair loss following COVID-19 in Iraqis (n=480, ≥19 years). An online survey assessed demographics, COVID-19 details, and hair loss experiences. Descriptive statistics and chi-square tests explored associations between hair loss and factors like COVID-19 infection, severity, sex, and age.

Results: Among 480 participants, 74.5% reported self-reported hair loss, with most experiencing onset within 1-2 months of COVID-19. The duration of hair loss varied, with nearly equal proportions experiencing hair loss for 1-2 months and exceeding 6 months. A significant majority (79.5%) sought medical attention from a dermatologist. Hair loss was more prevalent among those with a history of COVID-19 infection (83.5%) compared to those who tested negative (38.0%). Sex did not show a statistically significant association with hair loss, but age did. The youngest age group (19-29 years) had the highest prevalence of hair loss.

Conclusion: The study identified a high prevalence of self-reported hair loss following COVID-19 infection, suggesting a potential link. The hair loss characteristics align with telogen effluvium. Further research is needed to explore the biological mechanisms and develop targeted treatments.

Keywords: Post-COVID hair loss, COVID-19 infection, prevalence, and Iraqi population

Introduction

The ongoing COVID-19 pandemic, caused by the SARS-CoV-2 virus, continues to pose a significant global health threat. While the primary respiratory illness associated with COVID-19 is well-documented, a growing body of research reveals a spectrum of long-term effects collectively termed post-acute sequelae of COVID-19 (Long COVID) [1]. One such concerning post-infectious manifestation is hair loss, impacting a substantial portion of recovered patients [2, 3]. Understanding the association between COVID-19 and hair loss in the Iraqi population holds particular importance for several reasons.

Hair loss, medically known as alopecia, can be a distressing side effect for individuals who have recovered from COVID-19. Beyond the aesthetic concern, it can indicate underlying physiological disruptions triggered by the viral infection. Studies suggest that hair loss is a relatively common symptom experienced by 30-50% of individuals recovering from COVID-19 [4, 5]. This phenomenon is attributed to a disruption in the hair growth cycle known as telogen effluvium (TE) [3]. TE occurs when a higher-than-usual proportion of hair follicles prematurely enter the resting phase and subsequently shed. While hair loss due to TE is often temporary and resolves within 6-12 months, the psychological impact can be significant [6].

There is a compelling rationale for investigating hair loss following COVID-19 infection specifically within the Iraqi population. Firstly, Iraq has experienced a substantial burden of COVID-19 cases. As of July 2024 (the time of this study), Iraq has reported a significant number of confirmed infections, highlighting the need for research that addresses the population's post-COVID health concerns [7].

Secondly, several factors prevalent within the Iraqi population necessitate investigation due to their potential interaction with COVID-19 and hair loss. These factors include.

Nutritional Deficiencies: Deficiencies in iron and vitamin D are prevalent nutritional concerns in Iraq^[8]. These deficiencies are known to contribute to hair loss and may exacerbate the effects of the viral infection on hair growth^[9].

Pre-existing Comorbidities: The presence of pre-existing comorbidities like diabetes or thyroid disorders, which can independently influence hair loss, warrants examination within the Iraqi COVID-19 population^[10, 11]. Understanding how these conditions interact with COVID-19 to impact hair loss is crucial.

Genetic Predisposition: Investigating the role of genetic predisposition in the Iraqi population can offer valuable insights into susceptibility to hair loss following COVID-19 infection^[12].

The findings of this study will contribute valuable insights to the growing body of research on post-COVID hair loss. Understanding the prevalence and characteristics of hair loss in the Iraqi population can inform targeted interventions and improve overall patient well-being. Additionally, this study can shed light on potential underlying mechanisms specific to the Iraqi population, such as nutritional deficiencies or genetic predisposition, which may have broader implications for understanding post-COVID hair loss globally.

By investigating the association between COVID-19 and hair loss within the Iraqi context, this study can contribute to improved patient care and inform healthcare professionals about the prevalence and characteristics of hair loss in Iraqi COVID-19 survivors, allowing for better patient management and counseling.

Objectives

1. Investigate the prevalence of self-reported hair loss following COVID-19 infection in the Iraqi population.
2. Identify the characteristics of the self-reported hair loss population, including onset timing, duration, and healthcare-seeking behavior.
3. Explore the potential association between hair loss and various factors such as COVID-19 infection, severity of infection, sex, and age.

Subjects and Methods

Study design: This study employed a cross-sectional study design to assess the prevalence of hair loss following COVID-19 infection in the Iraqi population at a single point in time. Cross-sectional studies provide a snapshot of the population's health characteristics at a specific moment, allowing for efficient evaluation of the current burden of hair loss potentially associated with prior COVID-19 infection

Study setting and timing: Data collection occurred from a representative sample of Iraqi residents who had previously tested positive for COVID-19. This sample was recruited during a defined period (April 2023 - June 2023) to capture

a snapshot of the hair loss prevalence at a specific point in time. This approach allowed for an efficient assessment of the association between past COVID-19 infection and current hair loss experiences.

Study Population: All individuals 19 years of age and older were initially considered for participation. To ensure a homogenous group suitable for analysis, inclusion criteria were applied. These criteria included: a minimum age of 19 years to minimize age-related hair loss variations, Iraqi residency, and documented informed consent. Conversely, individuals with pre-existing hair loss diagnoses, significant medical history impacting hair loss, current medications known to cause hair loss, or current pregnancy/breastfeeding were excluded to control for confounding factors influencing hair growth.

Sample Size and Technique: A convenience sampling approach was utilized. Individuals who met the pre-defined inclusion criteria were recruited through an online survey instrument hosted on a secure platform like Google Forms. The survey was distributed via targeted social media groups (e.g., Instagram, Telegram) to reach the target Iraqi population. Data collection for this study occurred after the conclusion of the COVID-19 epidemic within a defined timeframe, resulting in a final sample size of 480 participants.

Data Collection Tools: A standardized online survey instrument was developed to comprehensively assess relevant data points. The self-administered survey, designed for a secure Google platform, captured demographics (age, gender, ethnicity), medical history of hair loss (pre-existing conditions, medications), details of confirmed COVID-19 infection (severity, hospitalization), and a hair loss assessment section. This section included questions on onset, duration, perceived severity, and self-reported hair pull test results. To ensure clarity, comprehensiveness, and functionality, the survey underwent piloting on a small sample before full-scale implementation.

Data Management and Analysis: All collected data underwent a rigorous anonymization process to ensure participant confidentiality. Information was stored on a password-protected database with double data entry to minimize errors. Statistical analysis using software package version 26 provided a comprehensive picture of the study population. Descriptive statistics characterized participant demographics, COVID-19 features, and hair loss experiences. The chi-square test was employed to explore potential associations between hair loss prevalence and various factors, including COVID-19 infection status, severity of infection, sex, and age.

Ethical Considerations: Informed consent was obtained from all potential participants through an online survey. Participants were provided with a clear explanation of the study's objectives, procedures, and benefits, as well as their right to withdraw at any time. Participation was entirely voluntary and anonymized. Data confidentiality was ensured through de-identification and secure storage with access restricted to authorized personnel. These measures guaranteed participant privacy.

Data Availability: Due to ethical considerations and privacy concerns, the data of individual participants cannot be publicly shared.

Results

Table (1) reveals the study participants (N=480) consisted of a majority of females (60.8%) with males accounting for 39.2%. The age distribution showed a concentration in the (30-39) year old range (53.3%), followed by (19-29) year olds (42.5%). Representation from older age groups (40-49) years and 50+) was minimal (2.5% and 1.7%, respectively). A significant portion of participants (74.5%) reported a history of hair loss. Overwhelmingly, participants (80.8%) had a prior COVID-19 infection, confirmed through various methods including swab tests (mouth/nose: 40.8%), blood tests (10.8%), and diagnosis based solely on symptoms (29.2%). The severity of COVID-19 infection symptoms varied, with the largest group experiencing mild symptoms (43.3%), followed by moderate (27.5%) and severe symptoms (10.0%). Notably, 19.2% of participants reported no prior COVID-19 infection.

Table 1: Characteristics of the study participants

Variable	N=480	%
Sex		
Male	188	39.2
Female	292	60.8
Age group (years)		
19 - 29	204	42.5
30 - 39	256	53.3
40 - 49	12	2.5
50 +	8	1.7
History of hair loss		
yes	358	74.5
no	122	25.5
History of COVID-19 infection		
yes	388	80.8
no	92	19.2
Covid-19 infection confirmation		
Not Infected	92	19.2
Swab test from mouth or nose	196	40.8
blood test	52	10.8
symptoms only	140	29.2
Covid-19 infection symptoms severity		
Not Infected	92	19.2
mild symptom	208	43.3
Moderate symptom	132	27.5
Severe symptom	48	10.0

Table 2 summarizes the characteristics of hair loss experienced by the study participants (N=480). The majority of participants (58.9%) reported experiencing hair loss onset within 1-2 months following their COVID-19 infection. This was followed by a notable decrease in frequency with onsets between 3-4 months (21.9%), 5-6 months (5.4%), and exceeding 6 months (13.8%). Regarding the duration of hair loss itself, the distribution was more evenly split. Nearly equal proportions of participants experienced hair loss lasting 1-2 months (13.7%) and exceeding 6 months (34.2%), with slightly lower frequencies for durations of 3-4 months (34.2%) and 5-6 months (17.9%). In terms of seeking medical attention, a significant majority (79.5%) reported having visited a dermatologist about their hair loss, while a smaller proportion (20.5%) had not. Family history also played a role, with 32.0% of participants indicating a

family history of hair loss, and 68.0% reporting no such history.

Table 2: Characteristics of hair loss experienced by the study participants

Variable	N=480	%
Onset of hair loss following COVID-19 infection (months)		
1-2	283	58.9
3-4	105	21.9
5-6	26	5.4
+ 6	66	13.8
Duration of hair loss (months)		
1-2	66	13.7
3-4	164	34.2
5-6	86	17.9
+ 6	164	34.2
History of dermatologist visit		
yes	382	79.5
no	98	20.5
Family history of hair loss		
yes	155	32.0
no	325	68.0

Figure (1) explored the prevalence of self-reported hair loss and a history of COVID-19 infection among the study population. Of the individuals surveyed, 80.8% (388) reported having a history of COVID-19 infection, while 19.2% (92) did not. Interestingly, hair loss was reported by 74.5% (358) of participants, with a history of COVID-19 infection, compared to 25.5% (122) of those who did not report a COVID-19 infection.

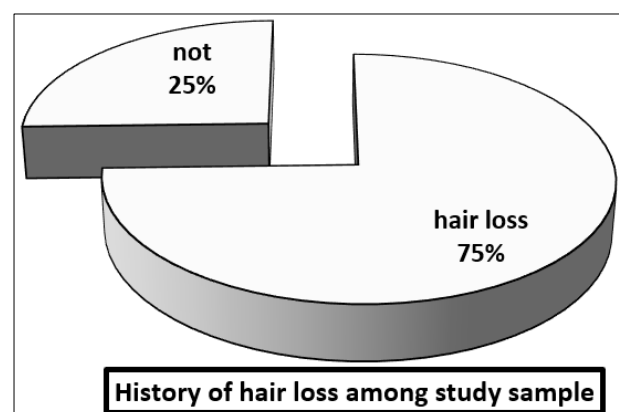
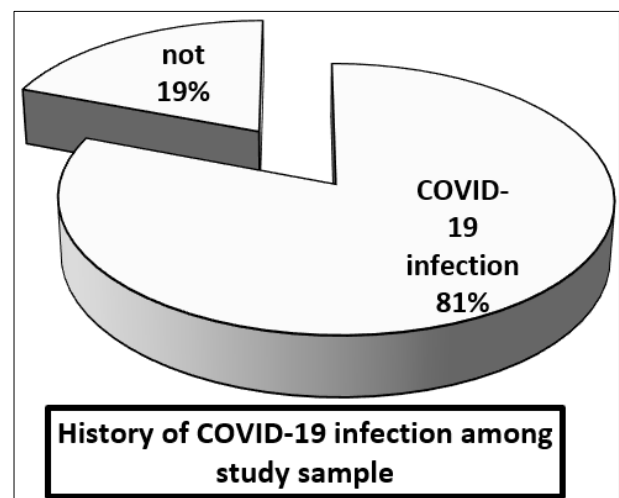


Fig 1: History of COVID-19 infection and hair loss among the study population

Table (3) explores the relationship between hair loss and the severity of COVID-19 symptoms. Overall, 74.5% of the 480 participants reported experiencing hair loss. A statistically significant association (p -value < 0.001) was observed between a history of COVID-19 infection and hair loss. Individuals with a positive COVID-19 diagnosis were more likely to experience hair loss (83.5%) compared to those who tested negative (38.0%). This association was held when stratified by symptom severity. Participants who experienced no COVID-19 symptoms, mild symptoms, moderate symptoms, and severe symptoms all demonstrated

a significantly higher prevalence of hair loss compared to those in the corresponding non-infected group. Interestingly, sex did not show a statistically significant association with hair loss (p -value = 0.183), with females experiencing a slightly higher prevalence (78.8%) than males (68.0%). However, age did demonstrate a statistically significant association (p -value < 0.001) with hair loss. The youngest age group (19-29 years) had the highest prevalence of hair loss (81.4%), with prevalence decreasing across subsequent age groups.

Table 3: The association between hair loss and the severity of COVID-19 symptoms

Variable	History of hair loss		Total 480 (100.0)	P-value
	Yes 358 (74.5)	No 122 (25.5)		
History of COVID-19 infection				
yes	323(83.5)	65 (16.7)	388 (80.8)	0.001
no	35 (38.0)	57 (62.0)	92 (19.2)	
Covid-19 infection symptoms severity				
Not Infected	35 (38.0)	57 (62.0)	92 (19.2)	0.001
Mild symptoms	163 (78.4)	45 (21.6)	208 (43.3)	
Moderate symptoms	116 (87.9)	16 (12.1)	132 (27.5)	
Severs symptoms	44 (91.7)	4 (8.3)	48(10.0)	
Sex				
Male	128 (68.0)	60 (32.0)	188 (39.2)	0.183
Female	230 (78.8)	62(21.2)	292 (60.8)	
Age group (years)				
19 - 29	166 (81.4)	38 (18.6)	204 (42.5)	0.001
30 - 39	178 (69.4)	78 (30.6)	256 (53.3)	
40 - 49	8 (66.7)	4 (33.3)	12 (2.5)	
50 +	6 (87.5)	2 (12.5)	8 (1.7)	

Discussion

This study investigated the prevalence and characteristics of self-reported hair loss following COVID-19 infection. The findings contribute valuable insights to the growing body of research on this emerging post-COVID-19 symptom.

Prevalence and Onset of Hair Loss: A significant finding is the high prevalence of self-reported hair loss (74.5%) among participants. This suggests a potential strong link between COVID-19 infection and hair loss. Recent studies support this association. A study by Awad Neha *et al.* (2022) reported a similar prevalence of 61.4% hair loss in a post-COVID population [2]. Similarly, Alkeraye *et al.* (2022) observed hair loss in 52.7% of their COVID-19 patients [13]. These findings collectively strengthen the evidence for hair loss as a common post-COVID-19 symptom.

The study also sheds light on the typical onset of hair loss. The majority of participants (58.9%) reported experiencing hair loss within 1-2 months following their COVID-19 infection. This timeframe aligns with the characteristic features of TE, a form of hair loss triggered by various stressors, including viral infections, where hair shedding increases 2-3 months after the stressor [3]. This suggests TE is a potential underlying mechanism for post-COVID hair loss, which is corroborated by other studies. Studies by Seyfi *et al.*, and Abdulwahab *et al.* (2022) found TE to be the most prevalent hair loss diagnosis among post-COVID patients [3,4].

Duration of Hair Loss and Seeking Medical Attention:

The study reveals a relatively even distribution regarding the duration of hair loss, with nearly equal proportions experiencing hair loss lasting 1-2 months and exceeding 6

months. This indicates a variable course of hair loss recovery in post-COVID individuals. Interestingly, a significant majority (79.5%) sought medical attention from a dermatologist for their hair loss, highlighting the potential psychological and social impact of this symptom. This finding is consistent with observations by Nalbandian *et al.* (2022) who reported a high rate of patient concern and distress associated with post-COVID hair loss [14].

Hair Loss and COVID-19 Severity, Sex, and Age:

A statistically significant association was observed between a history of COVID-19 infection and hair loss. This aligns with findings from other studies, such as the one by Gentile P. (2022) which reported a higher prevalence of hair loss among hospitalized COVID-19 patients compared to non-hospitalized ones [15]. However, the current study also revealed that hair loss occurred across all COVID-19 severity categories, suggesting it might not be solely dependent on disease severity.

Interestingly, sex did not show a statistically significant association with hair loss. This contrasts with some previous studies that reported a higher prevalence of hair loss in females with COVID-19 [2, 16]. However, the current study's larger sample size and focus on self-reported hair loss might explain this discrepancy. Further research with larger, more diverse samples is needed to definitively clarify the potential influence of sex on post-COVID hair loss.

In contrast to sex, age did demonstrate a significant association with hair loss. The youngest age group (19-29 years) had the highest prevalence, with prevalence decreasing across subsequent age groups [2, 16]. This finding is counterintuitive to the established knowledge that age is a risk factor for hair loss in general. More research is needed

to understand the specific biological mechanisms that might explain this observed association between younger age and post-COVID hair loss.

Conclusion and Recommendations

This study identified a high prevalence of self-reported hair loss (74.5%) following COVID-19 infection, suggesting a connection. The hair loss typically began 1-2 months after COVID-19, aligning with TE, a stress-related hair shedding condition. The duration varied, with some recovering within 1-2 months and others experiencing hair loss for over 6 months. Significantly, nearly 80% of participants sought medical attention, highlighting the potential psychological impact. Further research is recommended to explore the biological link between COVID-19 and hair loss, including investigating inflammation, nutritional deficiencies, and microvascular complications. Additionally, future studies should use standardized hair loss assessments and objective COVID-19 severity measures to strengthen data collection. Ultimately, research on treatment strategies for post-COVID hair loss is essential, as understanding the mechanisms will allow for targeted therapies to improve patient outcomes.

Authors contributions

The study was a collaborative effort with Dr. Hayder Wadood Majeed, and Dr. Israa Hasan Nader leading data collection and study implementation, while Dr. Nada Musaab Abbas and Dr. Tamara Riyadh Al-Rudaini focused on data analysis and manuscript preparation. All authors then critically reviewed the report and provided final approval for the current version.

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Conflict of interest

The authors declare that there is no conflict of interest in the publication of this article.

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