Telogen effluvium in covid-19 patients: A cross-sectional survey

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Abstract

Objective: To determine the frequency of telogen effluvium in post-coronavirus disease-2019 patients.

Method: The cross-sectional study was conducted at the Department of Dermatology, Pakistan Air Force Hospital, Islamabad, Pakistan, from February 10 to August 10, 2022, and comprised coronavirus disease-2019 patients of either gender aged 14-60 years. Telogen effluvium was defined as diffuse, non-scarring shedding of hair. Patients' own approximate assessment of the degree of hair loss using 60-second timed hair count for 3 consecutive days was taken as a subjective tool to grade the severity of hair loss per day as mild (<20 hair/day), moderate (20-70 hair/day), severe (71-100 hair/day) and very severe (>100 hair/day). The severity of coronavirus disease-2019 was assessed through high-resolution computed tomography chest severity scoring as mild (0-9), moderate (10-19) and severe (≥20). Data was analysed using SPSS 23.

Results: Of the 160 patients, 83(51.9%) were males. The overall mean age was 30.72±6.026 years, and the mean coronavirus disease-2019 severity score was 12.83±5.16. Telogen effluvium was noted among 46(28.8%) patients; 8(17.4%) mild, 21(45.7%) moderate, 12(26.1%) severe, and 5(10.8%) very severe. Females had a significantly higher frequency of telogen effluvium compared to males ($p<0.01$).

Conclusion: Telogen effluvium was noted as one of the frequent consequences of the coronavirus disease-2019, and it was strongly associated with the female gender.

Keywords: COVID-19, Pandemic, Real-time polymerase chain reaction, Severe acute respiratory syndrome coronavirus-2. (JPMA 75: 1378; 2025) **DOI: https://doi.org/10.47391/JPMA.21262**

Introduction

Coronavirus disease-2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), and was first such recorded in December 2019 in Wuhan, central China.[1,2] The most typical symptoms of COVID-19 are fever, dyspnoea, dry cough and pneumonia, while relatively less frequent symptoms include asthenia, headache, muscle or joint pain.[3,4] Skin manifestations like chilblains in young individuals, maculo-papular and vesicular rashes are some of the frequently observed skin manifestations among COVID-19 patietns.[5,6] Abrupt hair loss following COVID-19 infection were reported during the COVID-19 pandemic.[7] Telogen effluvium (TE) is documented to be a frequent cause of alopecia. TE can be due to numerous factors, such as medicines, trauma, emotional and physiological stress.[8] Acute TE may usually begin after a few months following a COVID-19 infection, and may typically last for six months.[9] Excessive hair fall occurs when the proportion of scalp follicles in the telogen phase increases.[8] As of now, no specific treatment approaches are considered to treat post-COVID-19 TE, but clinicians advise elimination of underlying psychological and physiological stress that can self-limit and treat TE.[9,10]

Arrones-Moreno et al. revealed that 89.7% of the patients with acute TE had a confirmed diagnosis of SARS-Cov-2.[10] Aksoy et al. reported COVID-19-associated TE in 27.9% patients and the development of TE was noted after 53.76±23.77 days following COVID-19 real-time reverse transcription polymerase chain reaction (RT-PCR) positivity.[11] There is a dearth of local data on the matter, and the current study was planned to fill the gap in literature by determining TE frequency among post-COVID-19 patients.

Patients and Methods

The cross-sectional study was conducted at the Department of Dermatology, Pakistan Air Force (PAF) Hospital, Islamabad, Pakistan, from February 10 to August 10, 2022, and comprised COVID-19 patients of either gender aged 14-60 years. After approval from the institutional ethics review committee, the sample size was calculated using the World Health Organisation (WHO) calculator with confidence level 95% and margin of error 7% while anticipating the proportion of TE in COVID-19 patients to be 27.9%.[11] The sample was raised using non-probability consecutive sampling technique. Those included were COVID-19 patients diagnosed on the basis of RT-PCR. Those diagnosed on the basis of rapid antigen test were excluded, and so were those with a history of hair loss or treatment taken for hair loss before COVID-19.

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Written informed consent was obtained from all the participants or their parents/caregivers.

Baseline demographics, like age, gender, education, co-morbidities and residential status, were recorded. The date of COVID-19 RT-PCR positivity, negativity, or resolution of symptoms was recorded. Post-COVID-19 hair fall history was taken in detail, including the time it started, duration for which hair fall remained, and severity of hair fall per day recorded as mild, moderate, severe and very severe. TE was defined as diffuse, non-scarring shedding of hair. The diagnosis was based on a combination of clinical history, including excessive hair shedding (e.g., reduced ponytail diameter, clogged shower drains), patient-reported hair loss severity, and a positive hair pull test. The hair pull test was conducted by gently pulling 40-60 hair strands. The test was considered positive if ≥10% (4-6 strands) were pulled out. Additionally, the hair collected during the pull test was examined under light microscopic examination for club hair.[12] Wash test was not feasible at the health facility during the pandemic, so patient's own approximate assessment of the degree of hair loss was taken as a subjective tool to grade the severity of hair loss per day. Patients were instructed to perform a 60-second timed hair count for 3 consecutive days, by combing the hair forward for 60 seconds over a contrasting cloth before shampooing.[12] The average of 3 days was calculated, and was categorised as mild (<20 hair/day), moderate (20-70 hair/day), severe (71-100 hair/day) and very severe (>100 hair/day). The severity of COVID-19 was assessed through high-resolution computed tomography (HRCT) chest severity scoring in the form of mild (0-9), moderate (10-19) and severe (≥20).

Data was analysed using SPSS 23. Qualitative variables were presented as frequencies and percentages, while quantitative variables were expressed as mean±standard deviation. Chi-square test was applied to compare TE with respect to effect modifiers, like age, gender, co-morbidities, education level and severity of COVID-19. P<0.05 was taken as statistically significant.

Results

Of the 160 patients, 83(51.9%) were males. The overall mean age was 30.72±6.026 years (range: 14-60 years). Residential status of 114(71.3%) patients was urban, and the most frequent comorbidity was hypertension 43(26.9%) (Table 1).

TE was noted among 46(28.8%) patients; 8(17.4%) mild, 21(45.7%) moderate, 12(26.1%) severe, and 5(10.8%) very severe. Females had a significantly

higher frequency of telogen effluvium compared to males (*p*<0.01) (Table 2).

Table-1: Patients' baseline characteristics (n=160).

Characteristics	n (%)
Gender	
Male	83 (51.9)
Female	77 (48.1)
Age (years)	
14-40	135 (84.4)
41-60	25 (15.6)
Residence	
Urban	114 (71.3)
Rural	46 (28.8)
Education level	
Primary	32 (20.0)
Secondary	16 (10.0)
Higher Secondary	56 (35.0)
Bachelor	45 (28.1)
Master	11 (6.9)
Comorbidities	
Hypertension	43 (26.9)
Diabetes	39 (24.4)
Severity of COVID-19	
Mild	73 (45.6)
Moderate	82 (51.3)
Severe	5 (3.1)

COVID-19: Coronavirus disease-2019.

Table-2: Data stratification with respect to telogen effluvium.

Study variables	Telogen effluvium [n (%)]		*p*-value	Mean±SD	*t*-test (independent)
	Yes (n=46)	No (n=114)			
Gender					
Male	14 (16.9)	69 (83.1)	<0.01		
Female	32 (41.6)	45 (58.4)			
Age (years)					
14-40	39 (28.9)	96 (71.1)	0.75		
41-60	7 (28.0)	18 (72.0)			
Age (years)					
14-60	46 (28.8)	114 (71.2)		30.72±6.026	0.12
Residence					
Urban	28 (24.6)	86 (75.4)	0.13		
Rural	18 (39.1)	28 (60.9)			
Educational level					
Primary	10 (31.3)	22 (68.7)	0.92		
Secondary	6 (37.5)	10 (62.5)			
Higher Secondary	15 (26.8)	41 (73.2)			
Bachelor	14 (31.1)	31 (68.9)			
Master	4 (36.4)	7 (63.6)			
COVID-19 Severity					
Mild	10 (13.7)	63 (86.3)	0.57		
Moderate	33 (40.2)	49 (59.8)			
Severe	3 (60)	2 (40)			
COVID-19 Severity Score					
0-40	46 (28.8)	114 (71.2)		12.83±5.16	0.07
Hypertension	16 (37.2)	27 (62.8)	0.27		
Diabetes	12 (30.8)	27 (69.2)	0.98		

SD: Standard deviation.

Discussion

The present study found the frequency of TE to be 28.8% in post-COVID-19 patients compared to 24.2% and 73.3% reported earlier by Seyfi et al. in Iran[13] and Aldahish et al. from Saudi Arabia[14] respectively. One study reported that 66.3% patients had telogen alopecia and 58.4% had trichodynia.[15] Monari et al. reported the prevalence of alopecia following COVID-19 infection to be 31.3% in Italy.[16] It is clear that TE is a frequent manifestation following COVID-19 infection.[10,11,14,15]

Excessive hair loss in SARS-CoV-2 patients could be due to increased production of pro-inflammatory cytokines.[17,18] SARS-CoV-2 has been found to exhibit skin-related manifestations, like urticaria, livedoid vasculopathy, COVID toes, and a rash resembling chicken pox.[19] Excessive interferons might cause TE development when immune reaction destroys matrix cells.[20] Di Landro et al. revealed that thyroid function, vitamin B12, ferritin, and iron levels were all within normal ranges, but the main complaint of post-COVID-19 patients was hair loss.[21]

The present study noted that hypertension and diabetes mellitus were the most common comorbidities among COVID-19 patients who developed TE. The finding was consistent with literature.[22]

Hair loss is a stressful manifestation of COVID-19 which is self-limiting. By pointing to COVID-19 infection as a potential cause of acute TE, medical professionals can better counsel their patients.

The current study has limitations owing to a modest sample size, the absence of control group, and the fact that the study did not explore the impact of medications and stress even though medication is a potential cause of TE, with azithromycin, hydroxychloroquine and other medications used to manage COVID-19 having the potential to cause TE.[23] Besides, the psychological effects of a COVID-19 diagnosis and its emotional consequences may trigger TE.[24]

Conclusion

TE was found to be among the consequences of a COVID-19 infection, and it was significantly associated with the female gender.

Disclaimer: The text was presented at the 41st PADCON held in Karachi on November 12-14, 2022. Also, the text is based on an academic thesis done in the pursuit of the Fellowship of the College of Physicians and Surgeons (FCPS) Pakistan in Dermatology.

Conflict of Interest: None.

Source of Funding: None.

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FA, FS, ABH, SR, AS & MR: Concept, design, data acquisition, analysis, interpretation, drafting, revision, Final approval and Agreement to be accountable for all aspects of the work.