

Telogen Effluvium and Trichodynia in Different Severity Groups of Post COVID-19 Patients

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ABSTRACT

Introduction: Telogen Effluvium is one of the most common form of diffuse non scarring hair loss, usually occurring three months after a stressful event causing hair shedding. Trichodynia is an imminent and frequent warning sign of Telogen Effluvium. Increasing cases of Telogen Effluvium during COVID-19 era has been found and it should be an alarming sign for a dermatologist and patients who have been infected by COVID-19 in the past. **Aims:** To study Telogen Effluvium in post COVID-19 patients, onset of Telogen Effluvium and occurrence of Trichodynia in different severity groups of COVID-19. **Methods:** This casual-comparative study was conducted from January 2021 to December 2021 in total of 52 Telogen Effluvium patients with confirmed recent COVID-19 disease visiting in outpatient department of Dermatology in Nepalgunj Medical College Teaching Hospital. Patient's with physiological, psychosocial and other chronic illness known to trigger Telogen Effluvium were excluded. Hair pull test was done for diagnosing Telogen Effluvium. **Results:** The mean age of the study population was 31.0577 ± 11.78 years. There was a female preponderance with 39 (75%). The mean onset of hair loss after COVID-19 infection was 10.05 weeks and was significantly earlier among the higher severity groups. Among the patients with Telogen Effluvium, 16 (30.80%) presented with trichodynia. Kruskal- Wallis test showed that with increase in severity of COVID-19, there was early onset of Telogen Effluvium associated hair loss and increase occurrence of trichodynia with p value of 0.000 for both variables. **Conclusion:** Telogen Effluvium is common in post COVID patients. Post-COVID Telogen Effluvium is more common in females. The onset of Telogen Effluvium is earlier and is more associated with trichodynia with the increase in severity of COVID-19 during their illness.

Keywords: COVID-19, Hair loss, Telogen Effluvium

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INTRODUCTION

Corona Virus Disease-19 (COVID-19) is a rapidly spreading pandemic disease caused by "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2).¹ The clinical presentation of COVID-19 varies from an asymptomatic infection to a life threatening, multi-organ disease.² Besides the respiratory system, skin is one of the common organs that can be affected.³ The ongoing efforts within dermatology community has documented various cutaneous, hair, nail and mucosal manifestations of COVID-19.^{2,3,4}

Telogen Effluvium (TE) is a self-limiting non-scarring alopecia characterized by diffuse hair shedding that occurs after stressful illness and resolves within six months of onset.⁵ TE has recently been reported as a post-infectious manifestation of the novel coronavirus SARS-CoV-2, occurring after few months of infection. TE is a delayed consequence of a shift in the hair cycle phase away from anagen where termination of anagen results in the onset of catagen and subsequently telogen.⁶ TE in COVID-19 is believed to be provoked by pro-inflammatory cytokines, impaired anti-coagulation and severe psychosocial

stress.⁵ Trichodynia corresponds to a complex symptom that includes pain, pruritus and/or a burning sensation, most commonly associated with hair loss. It is generally considered as a sign of severity and in some cases it may be a warning symptom of imminent hair shedding which may occur after the trichodynia onset.¹ A careful history and physical examination is sufficient for diagnosis of TE and identification of its causative agent. Prompt diagnosis and management of disease may lead to better health outcomes.⁷ As there are very few studies regarding TE in post-COVID patients, we intended to study TE in post-COVID patient and compare its onset and associated symptoms with the severity of COVID-19 disease.

METHODS

This casual-comparative study was conducted from January 2021 to December 2021 in outpatient department of Dermatology in Nepalgunj Medical College Teaching Hospital, after taking ethical clearance from Institutional Review Committee (IRC). Out of 191 cases of Alopecia presenting in OPD during this period, 52 cases who were diagnosed as TE with confirmed recent COVID-19 disease and not falling

under our exclusion criteria were taken as sample size. Patient demographics, COVID-19 infection diagnosis by Polymerase Chain Reaction (PCR), symptoms, severity and duration of COVID-19 were recorded. Duration and onset of hair loss in TE and its associated scalp symptom Trichodynia were also recorded.

The diagnosis of TE was dependent on history and physical examination and confirmed by a hair pull test. Hair pull test was done by grasping 50 to 60 hair between thumb, index, and middle fingers in frontal, occipital, and both temporal regions of the scalp and the test was considered positive if more than 10% of pulled hair away from scalp were in telogen phase and hair with white clubbed bulb.⁸

Inclusion criteria: Registry of patients with laboratory confirmed SARS-CoV-2 infection who developed Acute TE with no previous history of hair loss and actively sought medical care at the Dermatology Department were included.

Exclusion criteria: All the patients with alopecia visiting our OPD who were COVID-19 negative or haven't done PCR test, patients with thyroid disorders, pregnancy, iron deficiency anemia, chemotherapy, central nervous system disorders and other chronic diseases requiring drugs like beta-blockers, ACE inhibitors, anti-coagulants etc. were also excluded. Thyroid function test, complete blood count and serum ferritin was done to support the exclusion criteria.

A thorough past medical history was taken from the patient's and the attendant's regarding oxygen saturation, requirement of hospitalization, oxygen therapy and ICU admission. Severity of COVID-19 disease was done according to the WHO criteria.

COVID-19 disease severity classification

Mild disease - symptomatic patients meeting the case definition (fever, cough, fatigue, anorexia, myalgia, sore throat, nasal congestion, headache, diarrhea, nausea and vomiting, anosmia and ageusia) without evidence of viral pneumonia or hypoxia with SpO2 ≥94%.

Moderate Disease - with clinical signs of pneumonia (fever, cough, dyspnoea) with SpO2 90-93% on room air.

Severe Disease - with clinical signs of pneumonia (fever, cough, dyspnoea) with SpO2 < 90% on room air.

Critical Disease - severe pneumonia with oxygenation impairment requiring ICU admission.⁹

Statistical Analysis:

Data were analyzed using SPSS 20. Means were calculated for descriptive analysis and Kruskal-Wallis Test was used for comparative analysis of ordinal variables. 'p' value less than 0.05 was considered significant.

RESULTS

The mean age of the study population was 31.0577±11.78 years with the maximum age 77 years and minimum age 16

years. There was a female preponderance with the numbers of female and male, 39 (75%) and 13 (25%) respectively.

The mean onset of hair loss after COVID-19 infection was 10.05 weeks. The onset of hair loss was significantly different in different COVID-19 severity groups with the shortest being in critical and the longest being in moderate groups. Among the patients with TE 16 (30.80%) presented with trichodynia.

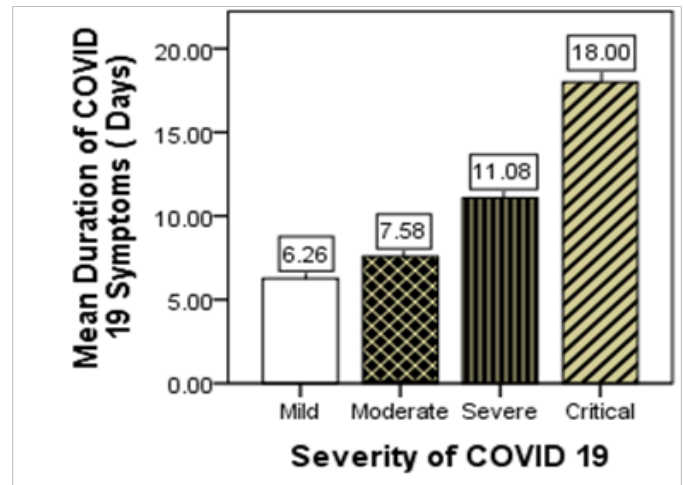


Figure 1: Duration of COVID-19 symptoms among different severity groups of COVID-19

Duration of COVID-19 symptoms was longer in higher severity groups (Figure 1).

Time of Onset of Hair loss (Weeks)	Severity of COVID-19	N	Mean Rank	Chi-Square	23.227
	Mild	23	31.80		
Df = 3	Moderate	12	34.71	Asymp. Sig. = .000	
	Severe	12	17.92		
	Critical	5	3.00		
	Total	52			

Table I: Time of Onset of Hair loss in different severity groups of COVID-19

There was statistically significant difference for the time of onset of hair loss when compared among the COVID-19 severity groups, p = 0.000 (Table I).

Trichodynia	Severity of COVID-19	N	Mean Rank	P value
	Mild	23	34.50	0.000
Moderate	12	28.00		
Severe	12	15.00		
Critical	5	13.70		
Total	52			

Table II: Trichodynia among severity groups of COVID-19

Association of trichodynia was significantly higher in higher severity groups of COVID-19 with p = 0.000 (Table II).



Figure 2: A female patient of TE with diffuse hair loss

DISCUSSION

Telogen effluvium (TE) is one of the most common form of hair loss. The term TE was first coined by Kligman to describe increased shedding of normal club hairs.¹⁰ Although it is self-limiting it causes tremendous psychological impact during the course. It is triggered by stressful events, drugs, endocrine disease, major surgeries, febrile illnesses and nutritional deficiencies.¹¹ Olds H et al proposed that formation of microthrombi disrupting the arterial hair supply and systemic inflammation as a consequence of pro-inflammatory cytokines and consumption of anticoagulants in COVID-19 explain how COVID-19 infection could provoke TE.¹²

In our study the age of the patient ranged from 16 years to 77 years with mean age of 31.0577 ± 11.78 years, which was congruent with study done by Babaei K et al¹³ with mean age of 30.97 ± 9.592 years. TE affects both male and female with higher incidence rate in female.¹⁴ In our study female preponderance was seen with female: male ratio 3:1 (ie 75% and 25%). Similarly, study done by Moreno-Arrones et al and Nancy Wei et al also showed female preponderance of TE in post COVID-19 patients with 78.5% and 96.4% respectively.^{15,5} The main reason for female preponderance may be due to more psychological stress, long hair which is more easily noticed by the females during hair shedding while among males shedding with short hair might be unnoticed.⁸ Literatures mention that mild infection of COVID-19 are expected to recover relatively quickly where as many individuals with increasing severity take longer time for recovery which is in congruous to our findings.¹⁶

The mean onset of hair loss in our study was 10.05 weeks which was similar to study done by Rodo A, Oliveira R and study done by Nancy Wei where the mean onset of hair loss was 10 weeks and 12 weeks respectively.^{1,5}

In addition to this we also compared the onset of hair loss among different severity groups of COVID-19 which revealed that the onset of hair loss from the post-COVID period was significantly earlier in higher severity groups of COVID-19 with the p value of 0.00. As mentioned earlier our study showed increase in severity of COVID-19 increased duration of illness. This increase in duration of illness might have led to increase in

stress among the more severe groups, which explains the early onset of hair loss in higher severity groups. The only exception in our study was that the onset was delayed in moderate group in comparison to the mild group, which may be due to excess of emotional stress as a consequence of anxiety in treating oneself with limited knowledge and psychological burden of preventing family members from infection during home isolation in the mild group.

Trichodynia was first observed and described as “the pain in the hair” by Sulzberger in 1960 as a distinctive symptom of TE and was first given its name as trichodynia by Alfredo Reborá. Its prevalence is around 20% and occurs in sites where hairs are actually shedding.¹⁷ In our study 30.08% patients presented with trichodynia. Our study also shows that the occurrence of trichodynia is greater with increase in severity of COVID-19 during the illness. When compared within the severity groups the percentage of occurrence of trichodynia was 0%, 25%, 75% and 80% in Mild, Moderate, Severe and Critical groups. Similarly a study done by Starace M et al showed that with increase in severity of COVID-19 disease TE is more associated with trichodynia.¹⁸

LIMITATIONS

The limitation of the study was small sample size in individual severity groups of COVID-19. Trichoscopy was not done due to unavailability which could have supported our diagnosis.

CONCLUSION

Telogen Effluvium is common in post-COVID patients. Post-COVID TE is more common in females of early adulthood. The onset of TE is earlier and is more associated with Trichodynia with the increase in severity of COVID-19 during their illness. So in this current pandemic we should suggest that COVID-19 infection should be suspected and investigated in patients who presents with acute TE.

REFERENCES

1. Roda Â, Oliveira-Soares R. Acute Telogen Effluvium in Patients Recently Infected with SARS-CoV-2. *J Port Soc Dermatol Vene reol* 2021;79(1):21-25.
2. Gadzhigoroeva A, Sanchez DG, Firooz A et al. COVID-19 Can Exacerbate Pattern Hair Loss and Trigger Telogen Effluvium - The Role of Proteoglycan Replacement Therapy with Nourkrin® in Clinical Treatment of COVID-19 Associated Hair Loss. *Gadzhigoroeva et al. J Dermatol Res Ther* 2021;7(2):1-8
3. Thuangtong R, Angkasekwinai N, Leeyaphan C et al. Patient Recovery from COVID-19 Infections: Follow-Up of Hair, Nail, and Cutaneous Manifestations. *BioMed Res Intl* Vol. 2021:1-6 <https://doi.org/10.1155/2021/5595016>
4. Deng J, Ngo T, Zhu TH et al. Telogen effluvium, Beau lines, and acral peeling associated with COVID-19 infection. *JAAD case reports* 2021 Jul;13:138-140
5. Wei N, Elbogen E, Chhesky A et al. Telogen Effluvium in Patients Recovering from COVID-19. *The Journal of Cutaneous Medicine* 2021;5(5):533-537

6. Liyanage D, Sinclair R. Telogen Effluvium. *Cosmetics* 2016 Mar; 3(2):1-8 <https://doi.org/10.3390/cosmetics3020013>
7. Hughes EC, Saleh D. Telogen Effluvium. [Updated 2021 Jun 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK430848/>
8. Sharquie KE, Jabbar RI. COVID 19 infection is a major cause of acute telogen effluvium. *Ir J Med Sci* 2021Aug;1-5. doi: 10.1007/s11845-021-02754-5.
9. World Health Organization. COVID-19 Clinical management. Living guidance 2021Jan: 22-23
10. Harrison S, Sinclair R. Telogen effluvium. *Clin Exp Dermatol.* 2002Jul;27(5):389-5. doi: 10.1046/j.1365-2230.2002.01080.x. PMID: 12190639.
11. Turkmen D, Altunisik N, Sener S et al. Evaluation of the effects of COVID-19 pandemic on hair diseases through a web-based questionnaire. *Dermatol Ther* 2020Jul;33(6):e13923:1-5
12. Olds H, Liu J, Luk K et al. "Telogen effluvium associated with COVID-19 infection." *Dermatol Ther* 2021Mar;34(2):1-4
13. Babaei K, Kavoussi H, Rezaei M, Kavoussi R. Characteristics of telogen effluvium in COVID-19 in western Iran (2020). *An Bras Dermatol.* 2021Nov-Dec;96(6):688-692. doi: 10.1016/j.abd.2021.05.006.
14. Asghar F, Shamim N, Farooque U, Sheikh H, Aqeel R. Telogen Effluvium: A Review of the Literature. *Cureus.* 2020May;12(5):e8320. doi: 10.7759/cureus.8320.
15. Moreno-Arrones O M, Lobato-Berezo A, Gomez-Zubiaur A et al. "SARS-CoV-2-induced telogen effluvium: a multicentric study." *J Eur Acad Dermatol Venereol* 2021;35(3):181-183
16. McIntosh K. COVID-19: Epidemiology, virology, and prevention In: Hirsch MS editor. *UpToDate*: 2022.
17. Rebora A. Telogen effluvium: a comprehensive review. *Clin Cosmet Investig Dermatol.* 2019Aug;12:583-590. doi: 10.2147/CCID.S200471.
18. Starace M, Iorizzo M, Sechi A et al. Trichodynia and telogen effluvium in COVID-19 patients: Results of an international expert opinion survey on diagnosis and management. *JAAD Int.* 2021Dec;5:11-18.