



## ACUTE TELOGEN EFFLUVIUM: A SEQUELA OF COVID-19 INFECTION

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## ABSTRACT

**Background:** The COVID-19 pandemic has affected different people differently. One of the many adverse consequences that emerged post a COVID -19 infections has been acute hair loss. Telogen effluvium is characterized by diffuse hair shedding 2-3 months after a stressor, and COVID-19 infection is potentially one such stressor. Therefore, this retrospective study is carried out to analyze the incidence of TE after post COVID-19 infection in Prayagraj and nearby district. **Methods:** This retrospective study was carried out at Tejas Skin Clinic, Prayagraj, from Feb, 2021 to June, 2021, which included only patients with history of COVID -19 disease with acute hair loss. Patients with the previous history of hair loss were excluded from the study. **Results:** Out of 63 cases, 47 (74.6%) cases were identified with Telogen effluvium attributed to COVID-19. Out of 74.6% cases 27.6% were male and 72.4% were females. The presentation of these patients suggests that Telogen effluvium as a possible sequela of COVID-19. **Conclusion:** Our study reports 43 cases of acute TE occurring between 1 and three months after COVID -19 infections which is actually the tip of the iceberg. Therefore, in the current era of pandemic, we suggest that a SARS-CoV-2 infection should be suspected and investigated in the patients who present with acute TE.

**KEYWORDS :** COVID-19, acute hair loss, Telogen effluvium.

As COVID-19 emerged suddenly out of thin air, the world witnessed a Pandemic. With the spread of SARS-CoV-2, health care systems around faced a new challenge managing the disease with significant morbidity and mortality [1]. Heavy attention has been paid to its life-threatening pulmonary and cardiovascular manifestations [2]. However, cutaneous signs and symptoms of disease have also been described and may significantly impact patients [3]. But few reports have focused on TE as a possible sequel of COVID-19.

First reported by Kligman in 1961, TE is a non-cicatricial alopecia disease characterized by the simultaneous loss of many telogen hairs [4]. Based on the duration of the disease, it can be divided into acute telogen effluvium (ATE) and chronic telogen effluvium (CTE). ATE usually occurs 2 to 3 months after a trigger event, which includes postpartum, discontinuation of birth control pills, hyperthermia, malnutrition, bulimia, blood loss, shock, surgery, severe psychological factors, emotional stress, chronic infections, dietary and iron deficiency, and smoking etc. Previous studies had observed TE occurred after dengue virus and rickettsia conorii infection [5, 6] recent studies also showed that some patients developed hair loss after SARS-CoV-2 infection [7]. Therefore, this retrospective study is carried out to analyze the incidence of TE after post COVID infection in Prayagraj and nearby district.

## METHODS

This study was conducted in Tejas Skin Clinic, Prayagraj U.P. It was a retrospective observational study included 63 patients complaining acute hair loss between the months of February 2021 to June 2021 and had a diagnosis of laboratory-confirmed COVID-19 infection. After obtaining informed consent, patients complaining acute hair loss after COVID-19 infection were included in the study while patients with the previous history of hair loss were excluded from the study.

All cases were diagnosed with positive RTPCR on nasopharyngeal swab from Moti Lal Nehru Medical College, Prayagraj. We reviewed the patient's demographics, dermatologic manifestation, and onset in relation to the first COVID-19 symptom. Prior dermatologic history, COVID-19 test results, and treatment modalities of COVID-19 infection were

also reviewed. In all the cases data related to the age, sex, duration of the lesions, occupation, personal habits etc were noted. Care was particularly taken to record the presence of superficial mycotic infections on other parts of the body and previous history of hair loss.

They all experienced tremendous hair loss within weeks to months after COVID. Dermatology examination revealed noncicatricial loss of hair volume, hair coming out in large clumps and few patients showed pronounced thinning along the frontal hairline. There was no obvious patchy hair loss area present with scaling, erythema or any other dermatological abnormalities on any ones scalp. A pull test was strongly positive (performed by wrapping 60 hairs between the thumb and index fingers and pulling gently upwards; it is considered positive when more than two hairs are removed) [8]. We hypothesise that the trigger owed to CoV-2 infection prior to this event.

## RESULTS

A total of 63 patients diagnosed with COVID-19, complained of acute hair loss were registered in the Dermatology Clinic. 16 out of those 63 patients were excluded from the study owing to a history of hair loss. The remaining 47 (74.6%) patients experienced acute hair loss for the first time after COVID infection as shown in figure 1 & 2. These patients did not have any other signs and symptoms of other causes of hair loss, such as an autoimmune disorder, vitamin deficiency, or hormonal abnormality. Out of the 47 cases, the mean age of patients was  $49 \pm 3.1$  years with males being about 27.6% and females about 72.4%. The mean duration of the hair loss after COVID infection was 1.5 months. Their laboratory parameters at the time of registration are depicted in Table 1.



Patient A

Patient B

**Table 1: Demographic and Laboratory parameters of patients with TE.**

S.N	Parameters	Values	Units
1	Age	49 + 3.1	years
2	Gender	males 27.6% females 72.4%.	
3	TLC	6000 + 2000	Cells/cumm
4	D-dimer	300 + 100	ng/ml(FEU)
5	CRP	4.0 + 3.1	mg/l

## DISCUSSION

Our study recorded 74.6% cases of TE while Turkmen reported 27.9% cases of TE during the pandemic. Another retrospective study in Turkey reported that the percentage of TE in dermatology clinics increased 5.51 times during the pandemic by comparing with the same season of the previous year [9].

Mean age of the patients in our study was 49 + 3.1. Female preponderance was observed in our study with a male-to-female ratio of 27.6:73.4 while many studies reported female patients only [8].

Our patients experienced acute hair loss after COVID infection which was consistent with telogen effluvium. Paus and Cotsarelis reported a type of alopecia that occurs several months after various physical and psychological burdens [10]. Dominguez-Santas et al were the first to report a case of acute TE, occurring 3 months after SARS-CoV-2 infection. [11], and have been followed by additional authors, who described TE after COVID-19 [12-13]. Further 3 patients and 10 patients were reported alopecia of varying severity after COVID-19 by Rizzetto et al and Mieczkowska et al [14-15].

It is hypothesized that SARS-CoV-2 may determine direct effects on the hair follicles (HF) via the ADE phenomenon as previously reported for dengue virus. Studies demonstrated that the HF dermal papilla cells, which express Fc receptors, are susceptible to the virus and attributed the mechanism of infection to the antibody-dependent enhancement (ADE) phenomenon [16]. ADE phenomenon has also been documented in corona viruses, including SARS-CoV and Middle East Respiratory Syndrome Corona virus (MERS-CoV) after the triggering event [17].

Interleukin (IL)-6 is a pro-inflammatory cytokine; it has a key role in severe COVID-19. High levels of IL-6 act on the HF, inducing the catagen phase as well as causing local inflammation and collapse of the immune privilege. It has been shown that high levels of IL-4, which are typical of COVID-19 in the elderly, also determine keratinocyte apoptosis in HF [18]. Additional molecules showing high levels in COVID-19 are metalloproteinases 1 and 3 and IL-1 $\alpha$ , which may inhibit the HF growth. Moreover, direct viral damage to HFs may be hypothesized in COVID-19 TE owing to the early onset of TE after SARS-CoV-2 infection [19].

Topical Minoxidil was prescribed to our patients, although counselling the patient on the self-limiting natural course of the condition is a crucial component of management. The hair eventually stops shedding and begin to grow back, but it may take up to 10 to 15 months for hair thickness to return to baseline.

## CONCLUSION

Our study clearly reports 43 cases of acute TE occurring between 1 and three months after COVID-19 infections which is actually the tip of the iceberg. However, further studies on a larger sample are needed to improve current understanding of this condition. Therefore, in the current era of pandemic, we suggest that a SARS-CoV-2 infection should be suspected and investigated in the patients who present with acute TE.

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