



PREVALENCE AND RISK FACTORS FOR HAIRFALL FOLLOWING COVID-19 INFECTION

Medicine

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ABSTRACT

Background: Hair fall is a major concern amongst the COVID-19 survivors. It causes much psychological distress. The exact underlying pathogenetic mechanisms are unknown. Thus, the present study was conducted to assess the factors associated with hairfall amongst COVID-19 survivors. **Method:** A total of 464 cases having recovered from COVID-19 infection atleast three months back were included in the study, provided they met the inclusion and exclusion criteria. Questionnaires were administered through google forms. Demographic details, details about COVID-19 infection and hairfall were collected and data was analysed. **Results:** The hairfall following COVID-19 infection was significantly more in the females; P value: less than 0.001. There was no difference in hairfall according to the presence of comorbidities (thyroid disorder, anemia, DM). The hairfall was significantly more in the cases requiring hospital admission and in those requiring oxygen supplementation at home; P value: less than 0.05. **Conclusion:** It can be effectively concluded that hairfall following COVID-19 infection affects females more than males. It is also significantly related to the severity of the COVID-19 infection.

KEYWORDS

COVID-19, hairfall, oxygen requirement, severity

INTRODUCTION

COVID-19 infection originated in China and soon became a pandemic in 2020. In the earlier period, control of the infection along with search and development of pharmaceuticals effective in the management of the COVID-19 infection was the priority. Now, the long-term consequences and sequelae are now becoming apparent and raising concerns. One such sequelae is hairfall. As COVID-19 causes systemic inflammation, it may significantly contribute to the increase in hair fall. The exact underlying pathogenetic mechanism remains unknown at large. Though hairfall has been prevailing in the society since long, however, not many definitive treatment options are available till date.¹ Hairfall following COVID-19 infection poses a unique challenge due to the acute insult of systemic inflammation and its impact on multiple organ systems along with the variety of medications used in the management.² All these insults may have diverse biological mechanisms leading to hairfall. Consequently, the hairfall following COVID-19 may be amenable to multiple treatment modalities.

As the studies in this regard are scarce, therefore, this study was conducted to assess the factors associated with hairfall amongst the COVID-19 survivors in Indian scenario.

MATERIALS AND METHOD

In this prospective, observational study, patients attending OPD with the laboratory confirmed diagnosis of COVID-19 infection (positive RT-PCR or Rapid Antigen Test on a nasopharyngeal or throat swab) during October 2022 to March 2023 were sent the questionnaire during the period of April 2024. Patients above 18 years of age and of either gender were included. Patients with a prior history of hairfall, cancer patients on chemotherapy, dialysis, skin conditions and pregnant women were excluded. Patients refusing to consent were excluded as well.

The questionnaire was shared through google forms. 500 participants were administered the questionnaire via WhatsApp messages. Participants were prompted to agree to the consent form at the start of the questionnaire. The questionnaire comprised of multiple-choice questions for details about demographic characteristics, past and personal histories, details about COVID-19 infection and recovery. Only the forms with all complete responses were included in the study. A total of 464 participants were included.

The data was extracted from the google sheets and analysed. P values were assessed by Chi square test for qualitative data and Unpaired t test for quantitative data. P value of less than 0.05 was considered as

“statistically significant” and indicated by “*” in the Tables.

RESULTS

In the present study, it was observed that the baseline hairfall was similar in all the age groups; P value: 0.143. The hairfall in the males and females was also similar; P value: 0.810.

The baseline hairfall was also similar with respect to the presence of comorbidities (thyroid disorders - P value: 0.056; anemia - P value: 0.093; diabetes - P value: 0.622), admission status (P value: 0.449) and requirement of oxygen (P value: 0.172).

The presence of hairfall after COVID was similar across all ages; P value: 0.240. There was significant difference in the genderwise distribution, with the hairfall after COVID being more in females than in males; P value: less than 0.001 (Table 1).

Table 1: Distribution Of The Presence Of Hairfall After COVID According To Gender

GENDER	HAIRFALL ABSENT	HAIRFALL PRESENT	P VALUE
FEMALE	24 (15%)	136 (85%)	<0.001*
MALE	178 (58.55%)	126 (41.45%)	

When analysed in terms presence of comorbidities, no significant differences were found in terms of thyroid disorder (P value: 0.476), presence of anemia (P value: 0.111) and presence of diabetes (P value: 0.865).

The gender wise difference in terms of admission status (P value: 0.750) and oxygen requirement (P value: 0.335) were insignificant.

When the hairfall after COVID was analysed in terms of admission status, it was observed that hairfall was more in the cases requiring admission; P value: 0.002 (Table 2).

Table 2: Distribution Of The Presence Of Hairfall After COVID According To Admission Status

ADMISSION	HAIRFALL ABSENT	HAIRFALL PRESENT	P VALUE
NO	162 (47.93%)	176 (52.07%)	0.002*
YES	40 (31.75%)	86 (68.25%)	

In terms of oxygen requirement, the hairfall after COVID was more in the cases requiring oxygen; P value: less than 0.001. (Table 3)

Table 3: Distribution Of The Presence Of Hairfall After COVID According To The Requirement Of Oxygen

OXYGEN	HAIRFALL ABSENT	HAIRFALL PRESENT	P VALUE
NO	190 (47.03%)	214 (52.97%)	<0.001*
YES	12 (20%)	48 (80%)	

DISCUSSION

Hair is an integral part of an individual's image. Therefore, hair loss causes variety of psychological problems like emotional stress, frustration, decreased self-confidence, anxiety, depression, etc. These may be experienced more by the women as compared to men as hair has traditionally being linked to femininity and pride.

In the present study, there was no age and gender wise difference in the baseline hairfall; P value: more than 0.05. However, after COVID, the hairfall was significantly more in the females as compared to males; P value: less than 0.001.

Similar female preponderance in the cases having hairfall was also found in other studies.^{4,5} Estrogen and progesterone have been known to have a protective effect on the hair follicles alongwith anti-inflammatory properties. COVID-19 infection poses acute insult and results in significant decrease in production of these female sex hormones, thereby increasing hair loss.⁶

When assessed according to the comorbidities, the baseline hairfall and the hairfall after COVID were similar irrespective of the presence of comorbidity (thyroid disorder, anemia and diabetes); P value: more than 0.05. Similar observation was made in the study by Arenas M. et al,⁷ where there was no significant association between hairfall and presence of comorbidities.

The baseline hairfall was similar in the two groups according to the admission status and requirement of oxygen. However, hairfall after COVID increased significantly in cases requiring admission (68.25% vs 52.07%); P value 0.002. Similarly, significant increase was also observed in the cases requiring oxygen (80% vs 52.97%); P value: less than 0.001. As requirement of admission and oxygen denote the severity of COVID-19 infection, therefore, it can be concluded that there was an increase in hairfall with increase in the severity of COVID-19 infection. Furthermore, it was observed that the requirement of admission and oxygen (P value: more than 0.05) was similar in both the genders, suggesting that there is no impact of gender on the severity of the disease.

In the study by Arenas M. et al,⁷ they observed that while 11.1% of the cases with mild COVID-19 infection had hairfall, the proportion increased to 88.9% in the cases with moderate to severe infection; P value: less than 0.001. They also observed that the proportion of patients having alopecia was significantly higher in the cases requiring oxygen therapy (95.4%) and longer hospital stay (71.1%); P value: less than 0.001.

In other study by Muller-Ramos P. et al,⁸ they observed that self-reported hairfall was significantly more in the cases with severe COVID-19 infection (determined by requirement of hospitalisation, disease length, and presence of inflammatory symptoms like high grade fever, dyspnea and myalgia). Similar results were also reported by other studies.^{9,10}

Several mechanisms have been hypothesized. COVID-19 causes systemic inflammation resulting in the overproduction of proinflammatory cytokines: interleukins, TNF, etc.¹¹ Alongwith causing increase in the oxidative stress in the follicular microenvironment,¹² these play a pivotal role in causing hair loss by varied mechanisms, including premature conversion to catagen, promoting premature apoptosis in hair follicles, disruption of the normal hair growth cycle and by inhibition of proteoglycan synthesis¹³ while accelerating their degradation.¹⁴

In addition, COVID-19 infection is in itself a stress-inducing condition. Stress has been known to adversely affect the hair growth cycle via increase in the secretion of catecholamines, cortisol and other hormones.¹⁵ Patient suffering from COVID-19 are also on a plethora of medications, many of which directly as well as indirectly contribute to hair loss.

Limitations: The present single centre study was limited by the OPD

attendance of the patients. Therefore, the results may not be generalised.

CONCLUSION

It can be effectively concluded that COVID-19 is a stress inducing, systemic inflammation, which promotes hairfall through diverse mechanisms. COVID-19 induced hairfall is more in females. It is independent of the presence of pre-existing comorbidities, but is significantly related to the severity of the COVID-19 infection. Further studies may be needed in this regard for a better understanding of the underlying pathophysiologic mechanisms contributing to hairfall in COVID-19 survivors, so that appropriate treatment strategies can be devised.

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