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Original Research Article

Efficacy of Dr. SKS hair booster serum for the treatment of hair loss in COVID-19 induced persistent telogen effluvium

Stuti Khare*

Department of Dermatology, Elements of Aesthetics, Mahakant Kripa Society Four Bungalows, Andheri West, Mumbai, Maharashtra, India

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***Correspondence:**
Dr. Stuti Khare,
E-mail: stuti109@gmail.com

ABSTRACT

Background: Excessive hair shedding occurs in patients with coronavirus disease 2019 induced telogen effluvium. Dr. SKS hair booster serum has demonstrated encouraging benefits in different types of alopecia in previous studies. We sought to evaluate the efficacy of Dr. SKS hair booster serum for the treatment of COVID-19 induced persistent TE.

Methods: A total of 500 patients aged 18 to 60 years who had recovered from reverse transcription-polymerase chain reaction proven COVID-19 infection but experienced sustained hair fall even after 6 months were included in the study. One millilitre of Dr. SKS hair booster serum injection was administered intradermally in scalp per session. Efficacy and safety outcomes were evaluated at baseline, 3 and 6 months after the treatment.

Results: Approximately half of the patients demonstrated excellent improvement in expert panel global photographic assessment at 3 months (vertex area; 43.6% and frontal area; 46%) that was increased at 6 months (vertex area; 48% and frontal area; 50%). Each patient's clinical condition improved. All patients were satisfied with the results in terms of mean total hair growth satisfaction scale score of five aspects at 3 and 6 months treatment.

Conclusions: Intradermal injection of Dr. SKS hair booster serum proves to be effective treatment for hair loss in COVID-19-induced persistent TE.

Keywords: COVID-19, Hair loss, Dr. SKS hair booster serum, Telogen effluvium

INTRODUCTION

Recent research has linked coronavirus disease 2019 (COVID-19) to vesicular, maculopapular, urticarial acroischemic lesions, and other skin manifestations like telogen effluvium (TE).[1] Most COVID-19 patients experience physiological and psychologic stress, both of which have the potential to act as TE triggers.[2] The manifestation of COVID-19 induced TE starts about two months after the trigger;[3] pro-inflammatory phase occurs in the hair follicles that causes a serious inflammation in the root sheath of the hair follicles. The hair follicle immediately releases its anagen and hence enters the telogen phase. As a result, excessive hair shedding occurs in COVID-19-induced TE.[4-7] Considering unavailability of standard protocol and lack of definitive treatment in TE patients following COVID-19 recovery and promising results of Dr. SKS hair booster serum in various types of alopecia we aimed to evaluate the efficacy of Dr. SKS hair booster serum for the treatment of COVID-19 induced persistent TE.[8-11]

METHODS

This open-label, non-randomized, multicentre, prospective study was carried out across four elements of

aesthetics hair clinic chains in India (Balaghat, Hyderabad, Jabalpur, Mumbai, and Nagpur) from August 2021 to January 2022. The study included 500 patients aged 18 to 60 years who had recovered from reverse transcription polymerase chain reaction (RT-PCR) proven COVID-19 infection but experienced sustained hair falls even after 6 months. Exclusion criteria were: patients complaining significant hair loss after suffering from COVID-19 infection, patients who were diagnosed with alopecia other than TE, patients who had recently initiated or discontinued use of oral finasteride/spironolactone, patients who were on therapy of minoxidil and/or oral contraceptives (to mitigate the bias due to confounding factors, or patients with any other medical condition or those taking medications known to impact hair loss, and pregnant or lactating women. All participating subjects provided written consent.

Injection technique

One millilitre of Dr. SKS hair booster serum injection was administered into the superficial layer (dermis) of the scalp using a small infusion through either an insulin syringe, mesotherapy, or through a derma roller/derma pen in a monthly session, with four-week interval between two sessions. The total treatment duration spanned six months, comprising six sessions. Initial changes and visible results were observed from the second to third month following the treatment. Efficacy and safety outcomes were evaluated at baseline, 3 and 6 months after the treatment.

Diagnosis of persistent telogen effluvium

Prior to initiating the treatment, patients were assessed to diagnose persistent TE secondary to COVID-19 infection and to rule out other causes of alopecia. Diagnosis was based on the following criteria: History of significant hair loss commenced a few weeks after the onset of COVID-19 infection. No history of significant hair loss before the infection. Examination of scalp to determine if the hair loss is diffused across the scalp, or predominately from the frontoparietal areas. Microscopic assessment of shed hair strands with a focus on identifying a majority of club hair. Strongly positive pull test and modified wash test. Dermoscopic criteria for persistent TE (decreased hair density, few empty hair follicles, predominance of hair follicle openings seen with only the emerging hair shaft within it, minimal variation in hair thickness, and lack of any inflammatory changes on scalp skin). Blood evaluation for: haemoglobin and complete blood count, thyroid and iron profile, blood sugar levels, serum zinc, serum copper, vitamin D3 and vitamin B12 levels for all patients before the study commenced. Patients were thoroughly examined and detailed medical history related to nutritional deficiency, hormonal imbalance, vitamin and minerals deficiency, stress factors, environmental factors, thyroid function, use of medications causing hair loss etc., were assessed and no specific abnormality was detected.

Scalp assessment and evaluation

Hair pull test: Hair pull test involved grasping a bunch of approximately 50-60 hairs between the thumb, index finger, and middle finger and pulling them from the base close to the scalp. The number of pulled-out hair was counted by an independent observer at baseline, 3- and 6-months after the treatment. The test was performed three times by the same clinician and average value was considered in the analysis.

Global photographic assessments: Standardized global photographs were captured with a digital camera (model EOS 650D DSLR; Canon Inc., Tokyo, Japan). A stereotactic positioning device with continuous light was employed to fix the head position and control the lighting. Subsequently, a panel of three blinded dermatologists independently evaluated hair growth improvement at the vertex and frontal views using a standardized 7-point rating scale, ranging from -3 to + 3.

Patient self-assessment questionnaires

Each patient was requested to perform self-assessment of hair growth and treatment satisfaction using the hair growth index (HGI) and hair growth satisfaction scale (HGSS).

Statistical analysis

All analyses were performed with the SPSS version 22 statistical software package (IBM Corp., Armonk, NY, USA). Continuous variables are presented as mean (±standard deviation), while categorical variables are reported as frequency and percentage. The comparison of two proportions is performed using the chi-square test, p values of <0.05 was considered to be statistically significant.

RESULTS

A total of 500 patients were included in the study, with a mean age of 38.25±3.2 years, ranging from 18 to 59 years. The study cohort consisted of 60% female and 40% male participants.

Hair pulled test

Before the treatment, the average number of hairs pulled out was 25. Following the 3-month treatment, this number significantly decreased to 5, indicating a negative pull test, which was observed in nearly 98% of the patients. The negative pull test was also apparent at 6-month of the treatment with an average number of hairs pulled of 4 (Figure 1).

Table 1: Demographic characteristics of study population (n=500).

Parameters	N (%)
Age (years) (Mean±SD)	38.25±3.2
Gender	
Female	300 (60)
Male	200 (40)

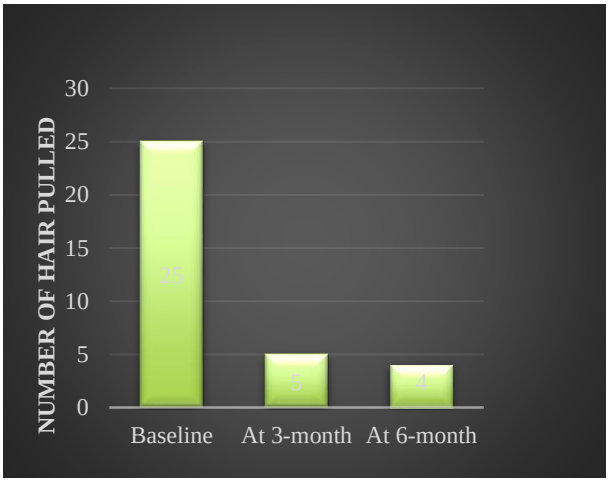

Figure 1: Hair pulled test-Number of hairs pulled at baseline, 3- and 6-months after treatment.

Photographic assessment

Expert panel global photographic assessment of the vertex area demonstrated a remarkable improvement (score >+1) at 3-month (99.6%) and 6-months (100%). Notably, 43.6% of patients had achieved an excellent improvement (score +3, representing 71-100% increase) at 3-months assessment. Furthermore, 3 months after treatment resulted in greater efficacy outcomes; the proportion of patients with excellent improvement increased from 43.6% to 48% at 6-months ($p<0.001$). On the frontal area, 46% of patients showed excellent improvement at 3-month, which increased to 50% at the 6-months (Table 2, Figure 2).

Patient self-assessment questionnaires

The clinical improvement (score ≥1) was observed in all patients. None of the patients in our cohorts had scores of -3 (greatly decreased), -2 (moderately decreased), and -1 (minimally decreased) for both the scores. The mean (±SD) total HGI score of three aspects (-9 to +9) was 2.05±1.14 at 3-months and 2.95±0.27 at 6-months ($p<0.0001$). All patients were expressed satisfaction with the results in terms of mean total HGSS score of five aspects (-15 to +15), with a score of 2.92±3.37 at 3-months and 2.97±0.22 at 6-months ($p=0.7047$). The proportion of patients according to the score grades for both aspects is presented in (Table 3-4).

Table 2: Expert panel global photographic assessment on vertex and frontal area at 3- and 6-months after treatment versus baseline.

7-point rating scale	3-months, N (%)	6-months, N (%)
Vertex area		
-3=greatly decreased	0 (0)	0 (0)
-2=moderately decreased	0 (0)	0 (0)
-1=minimally decreased	0 (0)	0 (0)
0=no change	2 (0.4)	0 (0)
+1=minimally increased	47 (24)	78 (15.6)
+2=moderately increased	162 (32.4)	180 (36)
+3=greatly increased	218 (43.6)	240 (48)
Frontal area		
-3=greatly decreased	0 (0)	0 (0)
-2=moderately decreased	0 (0)	0 (0)
-1=minimally decreased	0 (0)	0 (0)
0=no change	30 (6)	0 (0)
+1=minimally increased	110 (22)	160 (32)
+2=moderately increased	160 (32)	60 (12)
+3=greatly increased	230 (46)	250 (50)

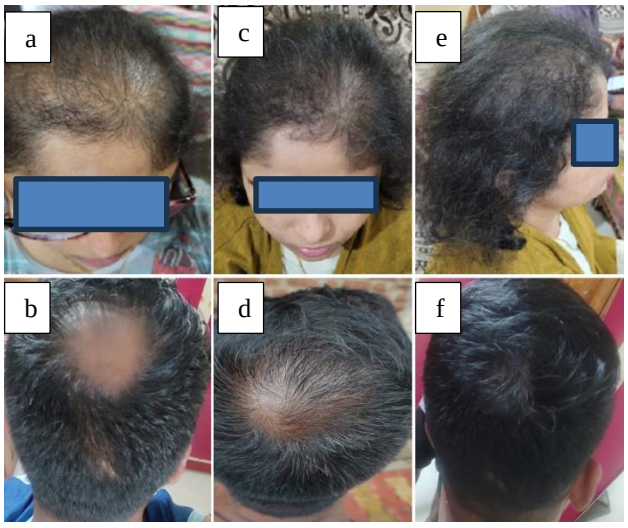

Figure 2: Representative global photographs on frontal and vertex area of 2 patients at; a, b) baseline, c, d) 3 months and e, f) 6 months after initiating treatment with Dr. SKS hair booster serum.

Table 3: Hair growth index.

Questionnaires	Area of thinning hair, N (%)			Amount of hair covering the scalp, N (%)			Quality of existing hair in term of thickness and hair shaft appearance, N (%)		
	3-months	6-months	P value	3-months	6-months	P value	3-months	6-months	P value
+1=minimally improved	15 (3)	3 (0.6)	0.080	13 (2.6)	3 (0.6)	0.860	18 (3.6)	3 (0.6)	0.072
+2=moderately improved	5 (1)	3 (0.6)	0.054	5 (1.0)	4 (0.8)	0.976	12 (2.4)	5 (1.0)	0.899
+3=greatly improved	480 (96)	494 (98.8)	0.005	482 (96.4)	493 (98.6)	0.027	470 (94)	492 (98.4)	0.0003

Table 4: Hair growth satisfaction scale.

Questionnaires	Overall appearance, N (%)			Appearance of thinning scalp, N (%)			Area of thinning scalp, N (%)			Amount of hair covering the scalp, N (%)			New hair regrowth, N (%)		
	3-months	6-months	P value	3-months	6-months	P value	3-months	6-months	P value	3-months	6-months	P value	3-months	6-months	P value
0=no change	0 (0.0)	0 (0.0)	-	0 (0.0)	0 (0.0)	-	0 (0.0)	0 (0.0)	-	0 (0.0)	0 (0.0)	-	0 (0.0)	0 (0.0)	-
+1=minimally improved	14 (2.8)	4 (0.8)	0.821	15 (3.0)	6 (1.2)	0.055	18 (3.6)	3 (0.6)	0.789	14 (2.8)	8 (1.2)	0.057	16 (3.2)	7 (1.4)	0.807
+2=moderately improved	5 (1)	2 (0.4)	0.941	7 (1.4)	5 (1.0)	0.953	12 (2.4)	5 (1.0)	0.855	5 (1.0)	4 (0.8)	0.976	14 (2.8)	3 (0.6)	0.827
+3=greatly improved	481 (96.2)	494 (98.8)	0.009	478 (95.6)	489 (97.8)	0.055	470 (94)	492 (98.4)	0.0003	481 (96.2)	488 (97.8)	0.145	470 (94)	490 (98.0)	0.0015

DISCUSSION

The main findings of the present study are: At 3- and 6-month after the treatment, negative pull test was apparent with average number of hairs pulled of 25 and 4, respectively. Remarkable improvement (score >+1) in expert panel global photographic assessment of the vertex area was observed at 3-month (99.6%) and 6-month (100%). Nearly half of the patients (43.6%) showed excellent improvement (score +3, representing 71-100% increase) at 3-month assessment, which was increased to 48% at 6-month ($p<0.001$). Similarly, nearly half of the patients (46%) showed excellent improvement on the frontal area at 3-month assessment, which increased to 50% at 6-month. Clinical improvement (score ≥1) was noted in all patients. All patients were satisfied with the results in terms of a mean total HGSS score of five aspects at 3- and 6-month after the treatment Numerous pathogenetic mechanisms have been proposed to describe COVID-19 associated TE. Pro-inflammatory cytokines like IL-6, TNFα, IL-1β, and IFNγ that are generated during systemic hyperinflammation of the COVID-19 may be accountable for the suppression of hair shaft elongation, matrix cells damage, and catagen development.[12-14] Microthrombotic response results from a decrease in the concentration of anticoagulant proteins, obstruction of the blood supply to the hair follicles, and cell death.[15] Moreover, direct COVID-19 infection of the hair follicle has been linked to the emergence of COVID-19-induced TE.[16] The prevalence of COVID-19-induced TE is higher in females than in males.[3,9] In the present study, females were more frequently affected by COVID-19 induced TE than males. This higher prevalence may be attributed to the fact that females take hair loss more seriously than males and are more likely to seek medical attention for COVID-19 induced TE. Males maintain their hair shorter and frequently have male pattern baldness, which makes it challenging to diagnose TE.[3,9]

In order to effectively manage the condition, it is essential to inform the patient about its self-limiting natural course. Resolving the underlying issue and getting rid of the inciting stressor are the cornerstones of COVID-19 induced TE treatment.[17] Numerous therapies for managing hair loss have been described in the literature. Finasteride and minoxidil are both FDA-approved drugs for androgenetic alopecia (AGA) and female patterned hair loss (FPHL). However, they are neither a catagen-inhibitor nor anagen inducer. These treatments do not aid in TE to promote hair renewal.[9] Nutritional supplements aid in hair growth and platelet rich plasma therapy is used in the treatment of AGA. Currently, there is no effective treatment for TE with satisfactory results.[9,18] Dr. SKS hair booster serum is a cocktail of micronutrients and multivitamins, including copper, niacinamide, hyaluronic acid, thiamine, riboflavin, and biotin. Combination of all these components aids in encouraging hair regrowth and hair regeneration.[19-30] Dr. SKS hair booster serum has already demonstrated its safety and efficacy in treating AGA in both males and females with a 95% patient self-assessment score and in treating FPHL in patients with polycystic ovary syndrome.[10,11] In the current study, we discovered that intradermal administration of Dr. SKS hair booster serum reduced hair loss, improved hair regrowth, and increased hair density in patients with persistent TE following COVID-19 recovery.

Limitations

Current study is limited by the lack of comparison between the hair serum product and the currently available therapeutic choices for the treatment of COVID-19 induced persistent TE. Hence, we advocate randomised studies with an active comparator and long-term follow-up in patients with COVID-19 induced persistent TE.

CONCLUSION

Dr. SKS hair booster serum when injected intradermally proves to be effective treatment for hair loss in COVID-19 induced persistent TE. Recently, the prevalence of TE among other forms of hair loss is on rise than previous years. This may be due to the pandemic of COVID-19 infection. Dermatologists should be mindful of the potential existence of TE in patients with prior history of COVID-19 infection; it will be beneficial in treating patients who are asymptomatic or minimally symptomatic patients.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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