A prospective and comparative study to evaluate the efficacy of Dermaroller and Minoxidil combination treatment in androgenic alopecia

Dr.Roopam Jain*, Dr.Surendra Singh Bhati**

*Dr.Roopam Jain, Ph.D. Scholar Dermatology Venereology & Leprosy, IMCH&RC, Indore &Professor, **Dr.Surendra Singh Bhati, Ph.D. Guide & Professor Dermatology Venereology & Leprosy, Index Medical College Hospital & Research centre, Indore

Abstract: Background:Minoxidil has better efficacy when combined with dermaroller. Dermaroller stimulates proliferation and differentiation of stem cells in the hair follicles bulge are a via multiple molecular mechanisms. Methods: They have emerged as new non-surgical treatment modalities for AGA, with minimal side effects and good safety profile. It is a promising treatment option in patients who cannot afford hair transplantation. Results: Our study showed best results in patients treated with Derma roller and minoxidil. Conclusion: It is a promising therapeutic modality with an excellent safety profile and patient satisfaction. [Shah R Natl J Integr Res Med, 2024; 16(1): 01-03, Published on Dated: 26/02/2025]

Key Words: Androgenic alopecia, Dermaroller, Minoxidil., KAP survey, Knowledge, Practice.

Author for correspondence: Dr.Preeti Jain, Professor & Head, Department of Physiology, BMCRI, Palanpur. Email: prjain77@gmail.com E-Mail: priyapatel130398@gmail.com Mobile: 8511027181

Introduction: The appearance and disappearance of hair have always symbolized the coming of age and ageing. Above all, the desire to remain permanently youthful explains the common dread of age-associated hair loss. For human beings, it has been associated with youthfulness and beauty in women and virility and masculinity in men.[1,2,3] Human hairs are small less pigmented and miniaturised, and they help in evaporative heat loss by sweating. Protection from the environment has been provided by specialized hairs such as hairs inside the nostrils, eyelashes, external ears. Eyebrows prevent sweat from getting into the eyes and scalp hairs may assist in stabilizing the temperature of the brain. Hairs are of use in forensic medicine as it can excrete toxic substances like arsenic. Hair follicles have been found to play a role in wound healing, maintaining epidermal homeostasis and tumorigenesis[4].

Hair loss can have a significant effect on the quality of life of a person and make him, or she feel self-conscious. A prompt diagnosis of different types of alopecia's and early intervention is worthful when dealing with these patient[5].

Androgenetic alopecia (AGA), which is also known as male and female pattern hair loss (FPHL), is a highly prevalent disorder that affects members of every society. Evidence suggests since ancient times AGA has been a health concern. According to Herodotus, one of the oldest medical specialities was the Egyptian 'physician of the head' who specialized in diseases of the scalp. Egyptian papyruses dating as early as 4000 BC list many remedies to treat hair loss; for example, a mixture of fats from hippopotamus, crocodile, tomcat, snake, ibex, and porcupine hair was boiled in water and applied to the scalp for four days[3]. Androgenetic alopecia (AGA) is a genetically determined progressive noncicatricial hair loss usually with a characteristic pattern that affects both genders. The hair thinning begins after puberty and increases in frequency and severity with age.

The prevalence of AGA appears to vary between different races and ethnicities. It is estimated that prevalence rates in Caucasian populations are around 30% for men in their 30s, 40% for men in their 40s and 50% for men in their 50s[6]. In India, a population-based study of 1005 subjects showed a 58% prevalence of AGA in males aged 30-50 years. Lower prevalence has been shown in oriental races[7]. In a study done by Wang et al. in China, the overall prevalence was 21.3%, while in a Korean study, the overall prevalence was 14.1 %8. All studies demonstrate a gradual increase in incidence with age[6]. Objective of study is to evaluate the efficacy of dermaroller for the treatment of androgenic alopecia

Material & Methods: This is a prospective comparative parallel group interventional study conducted in Index Medical College hospital And Research center Indore, including 90 subjects recruited in 2 groups. After randomization first group of people were given only topical minoxidil

5% twice daily, second group were given topical minoxidil 5% with dermaroller monthly once for 4 months.

Informed consent was taken from patients. History, clinical examination ad relevant investigation was done using a systematically designed proforma. Clinical and dermoscopicanalysis was done at baseline, 3months and 5 months.

The efficacy was assessed using primary efficacy analysis, secondary efficacy analysis and visual analogue scale.

Results : Distribution of the patients as per the Norwood Hamilton Grade in the three treatment arms at three different point of time - Norwood Hamilton Grading was used to see the effect of treatment in the three treatment arms at baseline, 3 and 5 month's. It was observed that at the end of 5 months, majority of the patients in all the groups improved to grade II or grade III. It was observed that, only the patients with severe baldness in group treated with only 5% minoxidil did not improve over the period of time. On chi-square analysis, this association was found to be statistically non-significant in all three treatment arms.

Distribution of the patients according to the Primary Efficacy Analysis for each treatment arm at 3 and 5 month's time point - Result depicts the distribution of the patients in the three treatment arms according to the 5 point Likert scale of primary efficacy analysis. It was observed that the variation at 5 months as compared to 3 months was significant in all the three treatment arms. Majority of patients with minoxidil combination with dermaroller improved moderately. The number of patients whose clinical picture worsened was higher for only minoxidil treatment.

Primary efficacy analysis of the three different treatment type using Ordinal logistic regression - The Primary efficacy analysis was calculated for the three treatment arms by Ordinal logistic regression analysis. Primary efficacy analysis at 3 months and 5 months were dependent variables measured on a 5 point Likert scale. Treatment arms variable was independent variable. Results were expressed with a coefficient and 95% confidence interval. In comparison to the group treated with only 5% Minoxidil that was taken as a reference, statistically significant association was observed only for the group treated by Dermaroller + minoxidil combination treatment type.

Distribution of the patients according to the Secondary Efficacy Analysis for each treatment arm at 3 and 5 months' time point - It was observed that the variation at 5 months as compared to 3 months was significant in all the treatment arms. Majority of the patients improved in all patients treated by Dermaroller + minoxidil combination treatment type. Worsening of the cases was seen in the treatment arms treated with only 5% minoxidil.

Secondary efficacy analysis of the three different treatment type using Ordinal logistic regression - Treatment arms variable was independent variable. Results were expressed with help of a coefficient and 95% confidence interval. In comparison to the group treated with only 5% Minoxidil that was taken as a reference, a higher statistically significant association was observed only for the group treated by Dermaroller + minoxidil combination treatment type.

Comparison of the Dermoscopic analysis for improvements in both treatment arms at three points of time - Dermoscopic analysis was used to depict the effect of three treatment arms and baseline data was compared with results at 3 month and 5 months of study period. Maximum improvement was observed in group treated with Dermaroller + minoxidil followed by minoxidil only. The difference in the improvement at 3 months and 5 months among the both treatment arms was statistically significant on ANOVA

Discussion: The present, prospective comparative parallel group interventional study was conducted on cases of androgenetic alopecia in the age group 18-45 years, attending outpatient department of Dermatology Venereology and Leprosy in Index Medical college hospital and research center, Indore. The study aimed to compare the efficacy of different types of treatments (topical application of 5% minoxidil versus 5% Minoxidil and dermaroller.

In the present study majority of the patients treated by Dermaroller and minoxidil combination improved moderately. At the end of 3 months about 27 % patients in Group 3 i.e. Dermaroller + minoxidil, improved moderately,

which increased to 50% at the end of 5 months. This difference was statistically significant when compared to the other two groups. While in a study done by Vaaruniet al.[8] showed excellent improvement in 60% (n=18) patients who were on Group B (minoxidil + Dermaroller), it was only 33.33% (n=10) patients of Group A (Only minoxidil) at the end of 6 months.

A study conducted by Farid et al.,[9] concluded that 45% improvement in hair density for the microneedling/Minoxidil group compared to 65% improvement in the minoxidil treatment group (P = 0.34), these results are in contrast to present study. According to them hair growth occurred faster with minoxidil therapy alone, and statistically significant improvements in hair growth were evident after 12 weeks of therapy with minoxidil while it took 28 weeks for the same result with combined microneedling/Minoxydil therapy. In Another study done by Dhurateta1[10] compared the results of weekly microneedling sessions used in conjunction with 5% minoxidil solution applied twice a day for 12 weeks to the twice-daily application of 5% minoxidil alone. The study done by Kallappaet al[10] showed that Microneedling with Minoxidil treated group was statistically superior to Minoxidil treated group in promoting hair growth in men with AGA.

Conclusions: Male androgenetic alopecia is seen commonly in middle-aged men due to genetic, hormonal and environmental factors. It has been shown to disrupt body image, reduced self-esteem and increased stress as reflected in the increased demand for treatment.

The effect of once-monthly microneddling by dermaroller with minoxidil for four months has shown a considerable increase in hair counts in the majority of the subjects of our study when compared to minoxidil alone.

Minoxidil has better efficacy when combined with PRP and dermaroller. PRP and dermaroller stimulate proliferation and differentiation of stem cells in the hair follicles bulge area via multiple molecular mechanisms Hence, PRP with minoxidil is a simple cost-effective and feasible treatment option in patients with androgenetic alopecia with high overall patient satisfaction.

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