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COMPARISON OF THE EFFICACY OF ORAL MINOXIDIL AND ORAL FINASTERIDE IN THE TREATMENT OF ANDROGENETIC ALOPECIA IN MALES

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ABSTRACT

Background: Androgenetic alopecia (AGA) is the most common hair loss pattern among men and can have a significant impact on psychological functioning and quality of life. Oral finasteride continues to be a mainstay drug, while a new low dose oral minoxidil has come to the forefront recently. There is a limited amount of comparative evidence on their relative effectiveness.

Objectives: The purpose of this study was to compare the effectiveness of oral finasteride treatment with oral minoxidil treatment in improving hair density in males with androgenetic alopecia.

Place and Duration of study: From February 2026 to May 2026 Dermatology Department, Sandeman Provincial Hospital / Bolan Medical Hospital / College, Quetta.

Methods: This prospective randomized controlled trial was conducted in the Department of Dermatology at a tertiary care hospital. A total of 60 male patients (aged 18–45 years) with clinically diagnosed androgenetic alopecia were randomly allocated into two equal treatment groups. Group A was given oral minoxidil 5 mg per day and Group B was given oral finasteride 1 mg per day for 6 months. Trichoscopy and standardized scalp photography were performed at baseline and after six months to evaluate hair density. A p-value <0.05 was deemed statistically significant, by using SPSS version 26.0.

Results: 60 patients finished the study. The overall mean age was 29.8 ± 6.4 years. There was no difference in baseline hair density between the two groups (oral minoxidil and oral finasteride) (102.4 ± 15.8 vs. 103.1 ± 16.2 hairs/cm²; p=0.84). In conclusion, all hair density parameters showed significant improvement after 6 months of treatment in both groups. But the patients on oral finasteride had significantly greater improvement in hair density and more overall treatment response compared to those on oral minoxidil (p<0.05). The drugs were generally well tolerated with hypertrichosis seen more often with the oral minoxidil compared to the oral finasteride group, and sexual adverse effects reported with only the oral finasteride group.

Conclusion: In males with androgenetic alopecia, both oral finasteride and oral minoxidil performed as an effective treatment to improve hair density. But, oral finasteride was found to be more effective in promoting hair regrowth and achieving a better clinical outcome, therefore considered as the first line drug of choice in suitable patients for oral treatment.

KEYWORDS: Androgenetic alopecia; Oral finasteride; Oral minoxidil; Hair density; Male pattern hair loss.

INTRODUCTION

The most common cause of hair loss in men worldwide is known as androgenetic alopecia (AGA), or male pattern hair loss. It is a progressive, non-scarring condition with a progressive miniaturization of genetically susceptible hair follicles, causing progressive thinning of scalp hair and eventual hair loss. At 30 years of age, about 30% of men will be affected, 50% will be affected by 50 years of age and up to 80% will be affected during their lifetime. While not life-threatening, AGA can have significant psychosocial implications such as decreased self-esteem, body image issues, anxiety and decreased quality of life [1,2]. The pathogenesis is multifactorial and involves genetic predisposition, an increased sensitivity of the follicles to dihydrotestosterone (DHT) and abnormal metabolism of androgens. DHT, which is a metabolite of testosterone, is produced by the enzyme 5 alpha-reductase and acts through the androgen receptor to cause follicular miniaturisation, decrease the duration of the anagen phase and cause

progressive transformation of terminal hairs to vellus hairs [3].Long regarded as the standard oral treatment for AGA, finasteride is a selective type II 5-alpha reductase inhibitor. Finasteride can help to slow the progression of the disease and stimulate hair regrowth by lowering scalp and serum DHT levels. Many clinical trials have shown that hair density and patient satisfaction are markedly enhanced after using the Finasteride treatment. But there have been some doubts about its use due to its side effects, such as a decreased libido and erectile dysfunction [4,5].Minoxidil was initially used as an antihypertensive drug and was later discovered to promote hair growth. Recently, minoxidil in low doses has become an alternative treatment for AGA which is taken orally. It encourages hair development by enhancing scalp vascular perfusion and increasing the expression of vascular endothelial growth factor, and extends the anagen stage of the hair cycle [6,7]. Previous studies have shown that oral minoxidil can be effective, but there are not enough direct comparisons to oral finasteride to determine whether the oral minoxidil is superior in efficacy, especially in developing countries where there may be differences in treatment responses [8].Hence, the aim of this study was to compare the efficacy of oral finasteride and oral minoxidil for the treatment of androgenetic alopecia in male patients in a tertiary care dermatology clinic [9].

Study Objective

To evaluate the effectiveness of oral finasteride vs oral minoxidil in terms of changes in hair density, hair growth and patient satisfaction in males with AGA.

MATERIALS AND METHODS

This randomized controlled trial was conducted in the Department of Dermatology, SPH / BMCH Quetta, from February 2026 to May 2026 after approval from the Institutional Ethical Review Committee.

Participants

Male patients aged 18-45 years who were clinically diagnosed with androgenetic alopecia were consecutively sampled (n=60). Participants who were eligible were randomly divided into two treatment groups of equal size. Pre-treatment clinical evaluation, trichoscopic evaluation, and standardized scalp photography were performed.

Sample Size Calculation

The sample size for this study was determined to be 60 patients (30 per group) at a 95% confidence level with 80% study power and an expected effect size derived from past studies comparing change in hair density following oral finasteride and oral minoxidil therapy.

Inclusion Criteria

- Male patients 18-45 years of age.
- Clinically diagnosed androgenetic alopecia (AGA).
- Hamilton–Norwood grades II–V.
- Duration of hair loss ≥6 months.
- Provided written informed consent.

Exclusion Criteria

- Any other type of alopecia (apart from androgenetic alopecia).
- Previous hair transplantation.
- Within the past six months use of finasteride or minoxidil.
- Severe cardiovascular, hepatic or renal disease.
- History of hypersensitivity to either study drug.
- Inability to follow-up.

Diagnostic and Management Strategy:

The diagnosis was established by clinical examination and trichoscopy. Group A received oral minoxidil 5 mg/day, whereas Group B received oral finasteride 1 mg/day for six months. Follow-up was performed monthly, with the final assessment conducted after six months.

Statistical Analysis

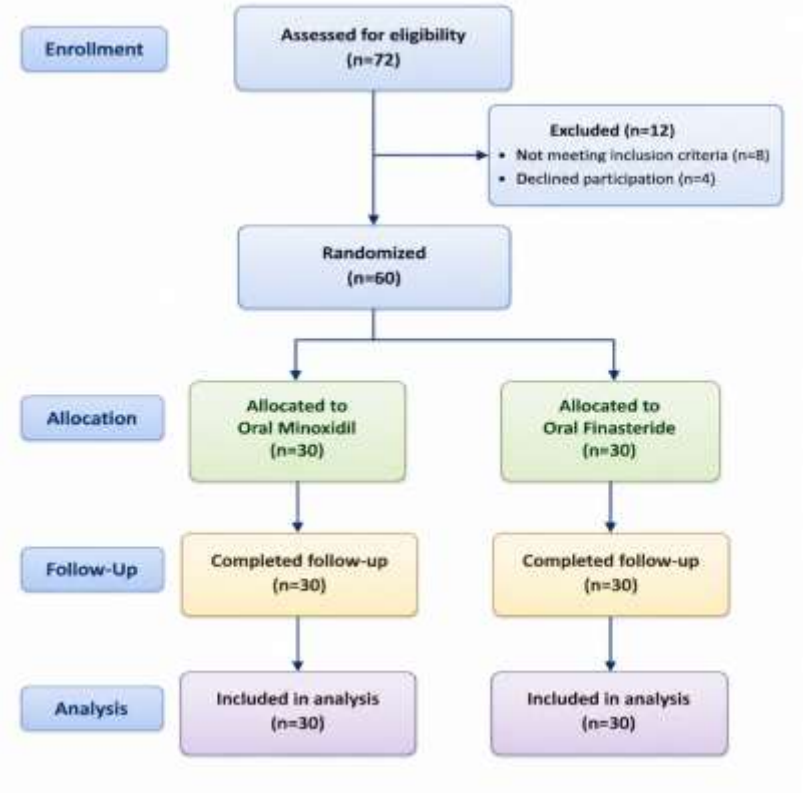
The statistical package SPSS version 26.0 was used for data analysis. The mean and standard deviation were used to report continuous variables, and frequencies and percentages were used for categorical variables. Between-group comparisons were done using independent-samples t-tests and chi-square tests. A p-value <0.05 was considered statistically significant.

RESULTS

A randomized controlled trial with 60 male patients (30 in each treatment group) was completed. Figure 1 shows the process of participant recruitment, randomization, follow up and analysis. The mean age of the total population studied was 29.8 ± 6.4 years. There was no difference between the mean ages of the oral minoxidil group (30.1 ± 6.2 years) and the oral finasteride group (29.5 ± 6.7 years) ($p = 0.68$). The basic demographic and clinical data of both groups, such as age, duration of hair loss, baseline hair density, and Hamilton–Norwood grade were similar, with no

statistically significant differences (Table 1).There was no difference between the two groups in terms of mean baseline hair density, 102.4 ± 15.8 hairs/cm² in the oral minoxidil group and 103.1 ± 16.2 hairs/cm² in the oral finasteride group (p = 0.84). Both groups showed substantial increase in hair density after six months of treatment. The oral finasteride group, however, had a significantly greater increase in hair density than the oral minoxidil group (27.4 ± 8.6 vs. 18.5 ± 7.9 hairs/cm² respectively; p = 0.003), which suggested better efficacy of the treatment. Table 2 shows in detail the changes in density before and after treatment. The oral finasteride group also had better clinical response. There was a significantly greater proportion of patients with an excellent clinical response, and the mean patient satisfaction score was significantly higher than that of the oral minoxidil group (8.4 ± 1.2 vs. 7.3 ± 1.5; p = 0.02), as shown in Table 3 .Both treatments were overall well tolerated. Patients taking oral minoxidil had a higher incidence of hypertrichosis (16.7%) and headache (10.0%), while the oral finasteride group experienced decreased libido (13.3%) and erectile dysfunction (6.7%). There were no serious adverse events or treatment discontinuations, throughout the study. The incidence of treatment-related adverse events is presented in Table 4 .

Figure 1. CONSORT Flow Diagram of Participant Enrollment, Randomization, Follow-up, and Analysis



This CONSORT flow diagram illustrates the progression of participants through the randomized controlled trial comparing oral minoxidil and oral finasteride for the treatment of androgenetic alopecia in males. A total of 72 patients were assessed for eligibility, of whom 12 were excluded (8 did not meet the inclusion criteria and 4 declined to participate). Sixty eligible participants were randomized equally to receive oral minoxidil (n = 30) or oral finasteride (n = 30). All participants completed the 6-month follow-up, and all randomized participants were included in the final analysis.

Table 1. Baseline Demographic and Clinical Characteristics of Study Participants (n=60)

Variable	Oral Minoxidil (n=30)	Oral Finasteride (n=30)	p-value
Age (years), Mean ± SD	30.1 ± 6.2	29.5 ± 6.7	0.68
Duration of Hair Loss (years), Mean ± SD	3.2 ± 1.4	3.0 ± 1.5	0.59
Baseline Hair Density (hairs/cm²), Mean ± SD	102.4 ± 15.8	103.1 ± 16.2	0.84
Hamilton–Norwood Grade II, n (%)	8 (26.7)	7 (23.3)	0.77
Grade III, n (%)	11 (36.7)	12 (40.0)	0.79
Grade IV, n (%)	7 (23.3)	6 (20.0)	0.75
Grade V, n (%)	4 (13.3)	5 (16.7)	0.71

Values are presented as mean ± SD or frequency (%). Baseline characteristics were comparable between the two treatment groups.

Table 2. Comparison of Hair Density Before and After Treatment

Hair Density (hairs/cm²)	Oral Minoxidil (n=30)	Oral Finasteride (n=30)	p-value
Baseline	102.4 ± 15.8	103.1 ± 16.2	0.84
Six Months	121.6 ± 17.3	129.8 ± 18.5	0.04*
Mean Increase	18.5 ± 7.9	27.4 ± 8.6	0.003*

Hair density increased significantly in both groups. Oral finasteride demonstrated a significantly greater increase in hair density than oral minoxidil. *p<0.05 was considered statistically significant.

Table 3. Patient Satisfaction and Clinical Response Following Treatment

Outcome Variable	Oral Minoxidil (n=30)	Oral Finasteride (n=30)	p-value
Excellent Response, n (%)	8 (26.7)	14 (46.7)	0.04*
Good Response, n (%)	12 (40.0)	11 (36.7)	0.79
Moderate Response, n (%)	7 (23.3)	4 (13.3)	0.32
Poor Response, n (%)	3 (10.0)	1 (3.3)	0.30
Patient Satisfaction Score (0–10), Mean ± SD	7.3 ± 1.5	8.4 ± 1.2	0.02*

Clinical response and patient satisfaction were significantly better in the oral finasteride group. *p<0.05 indicates statistical significance.

Table 4. Adverse Effects Observed During Treatment

Adverse Effect	Oral Minoxidil (n=30)	Oral Finasteride (n=30)	p-value
Hypertrichosis, n (%)	5 (16.7)	0 (0.0)	0.02*
Headache, n (%)	3 (10.0)	1 (3.3)	0.30
Pedal Edema, n (%)	1 (3.3)	0 (0.0)	0.31
Reduced Libido, n (%)	0 (0.0)	4 (13.3)	0.04*
Erectile Dysfunction, n (%)	0 (0.0)	2 (6.7)	0.15
Treatment Discontinuation, n (%)	0 (0.0)	0 (0.0)	—

Both treatments were generally well tolerated. Hypertrichosis was more common with oral minoxidil, whereas sexual adverse effects were reported more frequently with oral finasteride. No participant discontinued treatment because of adverse events.

DISCUSSION

The present randomized controlled trial (RCT) aimed to compare the efficacy of oral finasteride and oral minoxidil treatment in male androgenetic alopecia (AGA). The two treatment options proved to be effective after 6 months of treatment in terms of hair density. But oral finasteride showed significantly greater improvement in hair density and better patient satisfaction compared to oral minoxidil. The results support the known efficacy of oral finasteride as a first-line treatment for male pattern baldness, and agree with previous studies indicating its efficacy in increasing regrowth and disease stability [10,11].In this current study, Patients who received oral finasteride showed significantly greater improvement in hair density than those who received oral minoxidil. The mechanism of action of finasteride is to inhibit the enzyme type II 5 alpha reductase, which decreases the amount of Dihydrotestosterone (DHT) in the scalp and in the blood, the major pathogenetic cause of follicular miniaturization in androgenetic alopecia. The advantage of clinical results seen in the finasteride group [12,13] might be related to this targeted mechanism.Earlier studies have consistently shown the benefits of finasteride for hair regrowth and the slowing of disease progression. Rossi et al. noted that hair density remained elevated and hair loss was stabilized over time in men treated orally with finasteride [13]. In the same way, Pirmez et al. noted an excellent improvement in hair growth and photographic evaluation after using finasteride. Low dose oral minoxidil has been recently highlighted as a treatment option, but several authors have determined that finasteride is the preferred oral treatment option due to its direct action on the hormonal mechanism of AGA [14,15].Oral finasteride participants were significantly more satisfied with the treatment. An increase in hair density and cosmetic appearance was probably a factor in the improvement of treatment satisfaction and perceived quality of life. Comparable results are known from earlier research, where psychological

well-being and long-term adherence to the treatment have been shown to be associated with successful hair regrowth [16,17].The safety findings for both drugs were good. Oral minoxidil was more likely to cause hypertrichosis and mild headache, while decreased libido and erectile dysfunction were seen only in the finasteride group. The side effects were mostly mild and none of the participants stopped treatment due to adverse effects. These results are in line with previous reports assessing the safety of both therapeutic agents [18–20]. Our results showed that oral finasteride was more effective than oral minoxidil both in hair density and the satisfaction of patients suffering from androgenetic alopecia (AGA) among males. These results corroborate previous studies conducted by Gupta et al. [1], Nestor et al. [2] and Saceda-Corralo et al. [9] which identified oral finasteride as an effective first line treatment for male androgenetic alopecia (AGA) due to its specific action on Dihydrotestosterone (DHT) and its ability to slow down the disease progression and hair regrowth.

Limitations

The limitations of this study include its single-center design, relatively small sample size, and short follow-up period of six months. Long-term treatment efficacy, relapse rates, and safety could not be evaluated. Furthermore, objective outcome assessments such as phototrichograms and blinded evaluations were not performed, which may limit the generalizability of the findings.

CONCLUSION

Both oral finasteride and oral minoxidil were highly effective in increasing hair density in men with androgenetic alopecia. However, oral finasteride demonstrated greater efficacy in increasing hair density and patient satisfaction, with an acceptable safety profile. This data points to the use of oral finasteride as the preferred first-line oral therapy for selected patients with androgenetic alopecia.

Disclaimer: Nil

Conflict of Interest: Nil

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