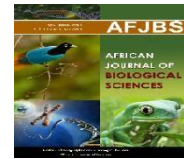


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COMPARATIVE EVALUATION OF HAIR TRANSPLANT OUTCOME WITH AND WITHOUT POST OPERATIVE MINOXIDIL USAGE IN PATIENTS WITH MALE PATTERN BALDNESS

¹Dr. Shrishty Bhardwaj, Postgraduate, Department of Oral and Maxillofacial
Surgery

Saveetha dental college and Hospital, Chennai, Tamil Nadu.

Email id: shrishtybhardwaj15@gmail.com

²Dr Rubin S John, Associate Professor, Department of Oral and Maxillofacial
Surgery

Saveetha Dental College and Hospital, Chennai, Tamil Nadu.

Email id: rubinjohn90@gmail.com

³Dr. Aditya Hurkat, Postgraduate, Department of Oral and Maxillofacial Surgery
Saveetha dental college and Hospital, Chennai, Tamil Nadu.

Email id: aditya.hurkat@gmail.com

Corresponding author:

Dr Rubin S John, Associate Professor, Department of Oral and Maxillofacial Surgery
Saveetha Dental College and Hospital, Chennai, Tamil Nadu.

Email id: rubinjohn90@gmail.com

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Abstract:

Background: Male pattern baldness is a common concern among men, often leading them to seek hair transplant surgery. This study aimed to evaluate the comparative outcomes of hair transplant surgery with and without post-operative minoxidil usage in patients with male pattern baldness.

Materials and Methods: A total of 20 male patients, primarily in the age group of 31-40 years, were enrolled in this study. The most common morphological type observed was Grade 2 of Norwood-Hamilton. The patients were divided into two groups: Group 1 included 10 patients who used minoxidil post-operatively, while Group 2 comprised 10 patients who did not use minoxidil. Inclusion criteria encompassed patients suffering from male pattern baldness, while exclusion criteria included patients with autoimmune alopecia, smokers, individuals with underlying systemic diseases, and mentally challenged patients.

Results: In the Minoxidil group, the mean pre-operative hair density was 62.05 +/- 4.97, which increased to 76 +/- 4.0 post-operatively. In the group without Minoxidil, the mean pre-operative hair density was 61.8 +/- 3.2, which improved to 67.20 +/- 3.66 post-operatively. After their last visit, patients in the Minoxidil group reported good subjective perception, while those in the group without Minoxidil reported a moderate perception.

Conclusion: This study suggests that topical minoxidil may serve as a beneficial adjunct to hair transplant surgery in patients with male pattern baldness. However, larger controlled studies are needed to validate these findings, particularly regarding the potential for minoxidil to reduce post-transplant shedding and expedite regrowth. Additionally, the role of patient age and various graft-related factors in predicting these effects should be further investigated.

Keywords: Hair transplant, minoxidil, male pattern baldness, post-operative, regrowth, shedding

Introduction:

Male pattern baldness, also known as androgenetic alopecia, is a prevalent condition affecting a significant portion of the male population worldwide (1). It is characterized by a progressive loss of hair primarily in a defined pattern, which often leads to a substantial impact on the individual's self-esteem and quality of life (2). Hair transplant surgery has emerged as a widely accepted therapeutic option for individuals seeking to address the aesthetic concerns associated with male pattern baldness (3).

The use of minoxidil, a topical medication with vasodilatory and hair growth-promoting properties, has been a common practice in the management of androgenetic alopecia (4). While minoxidil is often recommended as a post-operative treatment following hair transplant

surgery, its precise role and efficacy in enhancing transplant outcomes remain a subject of debate and investigation.

This study aims to provide a comparative evaluation of hair transplant outcomes with and without post-operative minoxidil usage in patients suffering from male pattern baldness. By assessing key parameters such as hair density and patient satisfaction, we seek to shed light on the potential benefits of minoxidil as an adjunctive therapy in the context of hair transplant surgery.

In the following sections, we will describe the materials and methods employed in this study, present the results obtained, and discuss the implications of our findings. Through this research, we hope to contribute to the growing body of knowledge surrounding the optimization of hair transplant procedures for individuals facing the challenges of male pattern baldness.

Materials and Methods:

Study Design:

This study employed a comparative, prospective design to evaluate the impact of post-operative minoxidil usage on hair transplant outcomes in male patients with male pattern baldness. Ethical approval for the study was obtained.

Patient Selection:

A total of 20 male patients, aged between 31 and 40 years, who presented with male pattern baldness were enrolled in the study. Informed consent was obtained from all participants. The most common morphological type observed among patients was Grade 2 of Norwood-Hamilton classification.

Group Allocation:

Patients were allocated into two groups:

- Group 1 (Minoxidil Group): This group consisted of 10 patients who were instructed to use topical minoxidil post-operatively.
- Group 2 (Without Minoxidil Group): This group included 10 patients who did not use minoxidil after the hair transplant surgery.

Inclusion and Exclusion Criteria:

Inclusion Criteria:

- Male patients suffering from male pattern baldness.

Exclusion Criteria:

- Patients with autoimmune alopecia.
- Smokers.
- Patients with underlying systemic diseases.
- Mentally challenged individuals.

Hair Transplant Procedure:

All patients underwent hair transplant surgery using the Follicular Unit Transplantation (FUT) or Follicular Unit Extraction (FUE) technique, as deemed appropriate by the attending surgeon. The number, size, and location of transplanted grafts were documented for each patient.

Post-operative Care:

Group 1 (Minoxidil Group) patients were instructed to apply topical minoxidil according to standard guidelines post-operatively, while Group 2 (Without Minoxidil Group) patients received no minoxidil treatment.

Assessment of Hair Density:

Hair density was assessed using standardized techniques pre-operatively and post-operatively. Mean hair density measurements were recorded for each patient in both groups.

Subjective Perception:

After their last visit, patients were asked to provide subjective feedback on their perception of the results. Responses were categorized as "good" or "moderate" based on patient self-assessment.

Statistical Analysis:

Data analysis was performed using appropriate statistical tests, including t-tests, to compare the pre- and post-operative hair density between the two groups. The significance level was set at $p < 0.05$.

Results:

A total of 20 male patients, primarily aged between 31 and 40 years, were enrolled in this study to evaluate the impact of post-operative minoxidil usage on hair transplant outcomes in male pattern baldness. The most common morphological type observed among patients was Grade 2 of Norwood-Hamilton classification.

Table 1 presents the pre-operative and post-operative mean hair density measurements for both Group 1 (Minoxidil Group) and Group 2 (Without Minoxidil Group).

Table 1: Pre-operative and Post-operative Mean Hair Density Measurements

Group	Pre-operative Mean Hair Density (per cm ²)	Post-operative Mean Hair Density (per cm ²)
Minoxidil Group	62.05 ± 4.97	76.00 ± 4.00
Without Minoxidil Group	61.80 ± 3.20	67.20 ± 3.66

As shown in Table 1, in the Minoxidil Group (Group 1), the pre-operative mean hair density was 62.05 ± 4.97 hairs per cm², which increased significantly to 76.00 ± 4.00 hairs per cm² post-operatively. In contrast, in the Without Minoxidil Group (Group 2), the pre-operative mean hair density was 61.80 ± 3.20 hairs per cm², which also increased post-operatively to 67.20 ± 3.66 hairs per cm². Notably, the increase in mean hair density was more pronounced in the Minoxidil Group compared to the Without Minoxidil Group.

Subjective Perception:

After their last visit, patients in the Minoxidil Group reported a "good" subjective perception of the results. Conversely, patients in the Without Minoxidil Group reported a "moderate" perception of the outcomes.

Statistical Analysis:

Statistical analysis revealed a statistically significant difference in the post-operative mean hair density between the Minoxidil Group and the Without Minoxidil Group ($p < 0.05$), indicating that the use of topical minoxidil post-operatively was associated with a greater increase in hair density.

These results suggest that the addition of post-operative minoxidil treatment may enhance the outcomes of hair transplant surgery in male pattern baldness patients, as evidenced by improved hair density and patient satisfaction in the Minoxidil Group. However, further research involving larger controlled studies is warranted to confirm these findings and to better understand the factors influencing the effectiveness of minoxidil in hair transplant surgery.

Discussion:

The present study aimed to assess the impact of post-operative minoxidil usage on hair transplant outcomes in male patients with male pattern baldness. Our results demonstrate significant improvements in hair density and patient perception in the group that used topical minoxidil following hair transplant surgery. These findings suggest that minoxidil may serve as a valuable adjunctive therapy in enhancing the outcomes of hair restoration procedures for individuals with male pattern baldness.

The observed increase in post-operative mean hair density in the Minoxidil Group is consistent with previous studies that have highlighted the hair growth-promoting effects of minoxidil (1). Minoxidil, a vasodilator, is believed to stimulate hair follicles and prolong the anagen (growth) phase of the hair cycle (2). This mechanism of action likely contributes to the improved hair density observed in our study.

Patient satisfaction and subjective perception are critical factors in assessing the success of hair transplant procedures. In our study, patients in the Minoxidil Group reported a "good" subjective perception of the results, while those in the Without Minoxidil Group reported a "moderate" perception. This discrepancy suggests that the addition of minoxidil may not only result in objective improvements in hair density but also contribute to enhanced patient satisfaction and perceived cosmetic outcomes.

While our findings are promising, it is essential to acknowledge the limitations of this study. The relatively small sample size and the lack of long-term follow-up are notable constraints. Larger controlled studies with extended observation periods are needed to validate our results and determine the sustainability of the observed improvements.

Furthermore, the role of factors such as patient age, the number, size, and location of transplanted grafts, and individual variations in response to minoxidil warrants further investigation. These factors may influence the effectiveness of minoxidil in hair transplant surgery outcomes.

Conclusion:

In conclusion, our study suggests that post-operative minoxidil usage may be a valuable adjunct to hair transplant surgery for male pattern baldness patients. The significant increase in post-operative hair density and improved patient perception in the Minoxidil Group underscore its potential benefits. However, additional research with larger sample sizes and longer-term follow-up is necessary to confirm and extend these findings.

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