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Evaluation of choice of medicine for hair growth in practising hair implant surgeons- original research

Dr. Siddarth Goudar

Assistant Professor, Department of Oral and Maxillofacial Surgery, Gadag Institute of Medical Science, Gadag, Karnataka, India
Email: siddarthgoudar1985@gmail.com

Dr. Santhi Priya Potharaju

Associate Professor, Department Of Periodontics, Government Dental College And Hospital, Afzalgunj, Hyderabad, Telangana
Email: drpriyatweety@gmail.com

Dr. Sharon Sylvia Dulapalli

Assistant Professor, Department Of Periodontics, Government Dental College And Hospital, Afzalgunj, Hyderabad, Telangana
Corresponding Author Email: Drsharonsylvia@Gmail.Com

Dr. Rahul VC Tiwari

OMFS, FOGS, (MHA), PhD Scholar, Dept of OMFS, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel University, Visnagar, Gujarat, 384315
Email: drrahulvctiwari@gmail.com

Dr. Ashwin Hiremath

MDS, OMFS, FAM, Consultant Maxillofacial Surgeon at Redymed Health Care, Belgaum, Karnataka, India
Email: ashwinhiremath77@gmail.com

Dr. Damarasingu Rajesh

OMFS, PhD Scholar, Dept of OMFS, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel University, Visnagar, Gujarat
Email: rajeshoralsurgeon@gmail.com

Abstract--Aim The purpose of the present research was to assess the treatment effects of various pharmaceutical agents used by hair implant surgeons to induce hair growth in affected patients. Methodology this study, 500 patients we combined the use of anti-oxidants, iron, calcium, zinc, amino acids, and vitamins E, D, and C with minoxidil and finasteride to control hair loss, reverse

miniaturization, and achieve new hair growth within 2-4 months with group I and II having male participants subjected to cyclic regimen and only minoxidil as well finasteride respectively whereas group II and IV had female participants also following cyclic as well as control regimen respectively. The patients were also followed clinically for 2 years and were observed to maintain their improvement. Results In Group I, the average improvement in density with cyclical medicine was 30% at 2 months and 52% at 4 months. The average improvement in caliber was 37% at 2 months and 47% at 4 months. In control Group II, density improved by an average of 2% at 2 months and 3.6% at 4 months. Caliber was unchanged in 44% of the patients. All patients in test Groups I and III felt that they saw new hair growth, the affected area was smaller, or friends and family noticed the difference. Conclusion Improvement was noted in males and females in all age groups and grades of hair loss at 2 months and continued at 4 months.

Keywords---Androgenetic alopecia, , vitamins, minoxidil.

Introduction

HAIR GROWTH is a dynamic process characterized by repeated cycles of active growth (anagen, 2–6 years), involution (catagen, 2–3 weeks), and rest (telogen, 2–3 months).¹ At any one time, approximately 90% of all scalp follicles are undergoing active growth in the anagen

phase.² Temporary or permanent hair loss can be caused by a number of factors, including medication, hair styling, chemotherapy, exposure to chemicals, hormonal and nutritional factors, generalized or local skin disease, chronic disease, and stress. However, the most common type of hair loss, by far, is androgenetic alopecia (AGA; also known as male or female pattern hair loss), which is estimated to affect half of all men and women by the age of 50 years.³ Androgenetic Alopecia (AGA) is a genetic type of hair loss with varying incidence and severity across different age groups and races.⁴ The androgen testosterone in its active form i.e., dihydrotestosterone (DHT) acts on receptors on the hair follicle and causes its gradual miniaturization. This converts terminal hair into vellus hair, eventually leading to baldness.⁵ As these androgen receptors are expressed to a greater degree in the hair follicles of the frontal and vertex region of the scalp in men, AGA manifests as a progressive pattern type of hair loss affecting these regions with a relative sparing of the occipital and temporal regions.^{6,7} The grading system followed for male AGA is the Norwood–Hamilton scale.⁴ In women, there is diffuse thinning mainly at the crown with a widening of the hair partition and this is graded using various scales such as the Sinclair, Ludwig, Ebling and Olsen scales.⁸ Treatment is aimed at reversing this androgen mediated hair miniaturization process as well as providing cosmetic coverage of the bald area. While there are multiple options available, there is no single solution for all. It has to be tailored according to the needs of the patients. The best results are obtained when a combination of treatments are used. Currently there are two pharmacologic treatments approved by the U.S. Food and Drug Administration

(FDA) to treat pattern hair loss in men: over-the-counter topical minoxidil solution and prescription-only oral finasteride tablets. Well-controlled clinical trials have demonstrated that these agents are safe and effective treatments, inducing hair regrowth in many individuals with mild to moderate hair loss.⁹ For woman, over-the-counter topical minoxidil 2% solution is the only FDA-approved pharmacologic agent for pattern hair loss. Minoxidil topical solution acts directly to enlarge miniaturized follicles and the diameters of the hair shafts they produce. Telogen hair follicles are converted to anagen hair follicles, and the anagen phase of hair growth is prolonged, thus slowing the progression

of hair loss.³ Cyclical therapy entails giving vitamins with calcium supplements on a single day, followed by iron and mineral combination product on one other day of the week and finally amino acid blend; the three regiments are also advocated that their intake be on alternative days as different nutrients and the daily dosing is avoided. The basis of this therapy is that hair requires nutritional support during their anagen growth phase and also for its maintenance; without nutrients, hair cannot get support and the stimulated hair growth to demonstrate disappointing outcomes. There are a number of prescription products that are approved for use in other medical conditions that may have some theoretical effect on hair loss. These include spironolactone, flutamide, progesterone, cyproterone acetate, and cimetidine. However, well-controlled trials in patients with androgenetic alopecia are lacking.¹⁰ In addition, there are countless unapproved treatments—many with herbal or “natural product” bases—that are sold directly to patients. Neither the efficacy nor the safety of the majority of these products for treatment of pattern hair loss have been established; many of the ingredients or products have not been approved by the FDA.

Aim of The Present Study

The purpose of the present research was to assess the treatment effects of various pharmaceutical agents used by hair implant surgeons to induce hair growth in affected patients.

Methodology

In this study, 500 patients we combined the use of antioxidants, iron, calcium, zinc, amino acids, and vitamins E, D, and C with minoxidil and finasteride to control hair loss, reverse miniaturization, and achieve new hair growth within 2-4 months. (Table 1) The patients were also followed clinically for 2 years and were observed to maintain their improvement. The supplements and finasteride are used cyclically once every 3 days.

- Group I: Male test group with 200 patients who followed cyclical medicine
- Group II: Male control group with 200 patients of similar age and hair loss grades as Group I, but who followed conventional minoxidil 2% and finasteride 1mg daily

- Group III: Female test group with 50 patients who used cyclical medicine; finasteride was not used
- Group IV: Female control group with 50 patients of similar age and hair loss as Group III, who used minoxidil 2% and B complex with biotin 260mg daily

All patients were clinically evaluated every 2 months using digital photographs and folliscope analysis. Evaluations were performed by four different assistants who were not aware of the patient profile and patient group.

Results

Age varied from 15 to 73 years, with 79% of the patients in the range of 21-40. Fifty-five percent of the patients were Hamilton Grades III and IV. In Group I, the average improvement in density with cyclical medicine was 30% at 2 months and 52% at 4 months. The average improvement in caliber was 37% at 2 months and 47% at 4 months. Patients with temporal angle receding and thinning in the crown area also responded well to 4 months of cyclical medicine. In control Group II, density improved by an average of 2% at 2 months and 3.6% at 4 months. Caliber was unchanged in 44% of the patients, it was improved by 1.4% at 2 months and 5.5% at 4 months, at which time 26% of patients still had no improvement. Group III, female patients on cyclical medicine, showed an average 31% improvement in density at 2 months and 51% at 4 months. The improvement in caliber was 21% at 2 months and 53% at 4 months. Receding female hair also showed marginal correction. Control Group IV density improved by 4% at 2 months and 10% at 4 months; 56% of females had no improvement at 2 months. Caliber improved by 5% at 2 months and 19% at 4 months in the control group. Patients responded to a self-assessment questionnaire at 4 months. In control Groups II and IV, 74% of patients said they looked the same. (Table 2) A few patients (3%) said that they had become worse than before. All patients in test Groups I and III felt that they saw new hair growth, the affected area was smaller, or friends and family noticed the difference. Some patients (1.5%) stopped treatment after noticing improvement at 4 months; they then noticed worsening of their hair condition in the next 3-6 months, and restarted treatment.

Discussion

Minoxidil and finasteride are proven, safe, and effective medications for androgenetic alopecia. The use of topical minoxidil and/or oral finasteride in hair transplant patients with viable but suboptimally functioning follicles in the region to be transplanted can add to the density and complement the surgical result by slowing down or stopping further hair loss. Results from preliminary uncontrolled clinical trials suggest that minoxidil may speed regrowth in transplanted follicles, prolong the anagen phase, and slow progression of future hair loss. Studies of minoxidil topical solution in men and women have demonstrated significant increases in both hair count¹¹ and hair weight¹² compared with a vehicle placebo control, with the minoxidil 5% solution significantly more effective than the 2% solution in male subjects. Recently Rundegren and Trancik¹³ evaluated the effects of minoxidil 5% and 2% topical solution on stabilization of hair loss in men

and women with androgenetic alopecia. Several studies have examined the use of minoxidil as an adjunct to hair transplantation surgery in men with androgenetic alopecia.¹⁴ In an uncontrolled study of 12 male patients with androgenetic alopecia, minoxidil 3% topical solution was administered twice a day to the transplant area starting 48–72 hours after hair transplant surgery. Two patients demonstrated hair growth without the usual shedding 2–4 weeks after surgery and two additional patients had regrowth within 4 weeks after postsurgical telogen effluvium. This is far sooner than the typical 3–5 months. Oral administration of finasteride produces a reduction in circulating and skin levels of dihydrotestosterone without reducing testosterone. Finasteride 1 mg/ day significantly lowers levels of dihydrotestosterone in the scalp, retards progression of hair loss, and induces hair growth in men with androgenetic alopecia. Data from three randomized, double-blind, placebo-controlled trials demonstrated that finasteride significantly increased hair counts and improved scalp coverage of both the vertex and frontal regions compared with placebo.¹⁵ It has been suggested that promoting hair growth requires supplementation of certain minerals, vitamins, amino acids, and antioxidants, as well as control of sebum secretion and antidandruff treatment. There are drawbacks to using vitamins, minerals, and amino acids together. Excess of vitamin A and E lead to improper keratinization of hair and cause hair loss.¹⁶ Absorption of minerals and vitamins is dependent on their relative deficiency in the body; iron and calcium given together reduce the absorption of one another.¹⁷ We have addressed these problems by giving these components once every 3 days. A combination of two different drugs per day was used on a schedule that repeated every 3 days for one complete cycle of 4 months. In female patients the same regimen was followed with 2% minoxidil but finasteride was omitted. Minoxidil 2% was used every day¹⁸ and 2% Ketoconazole plus Zinc pyrithione shampoo twice a week. Improvement in hair count, hair calibre, and control of hair loss was better with cyclical medicine than in the control groups. Improvement was noted in males and females in all age groups and grades of hair loss at 2 months and continued at 4 months.

Conclusion

It is important to note that there is no single treatment modality for male pattern hair loss that is 100% effective. Management requires a multi-disciplinary approach, which has to be individualized keeping in mind the expectations of patients, affordability, age and grade of hair loss.

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Tables

Table 1- Cyclical Medicine Program

Treatment repeats in 3-day cycles

- Day 1: Antioxidants, Calcium
- Day 2: Iron, Folic Acid & Vitamin C
- Day 3: Amino Acids & Finasteride 1mg (Biotin in females)
- Minoxidil 2% local application every day
- 2% Ketoconazole & Zinc Pyrithione Shampoo every 3 days

Table 2- Improvement of hair density and calibre

| Variable s | Group I | | Group II | | Group III | | Group IV | |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 2 month s | 4 month s | 2 month s | 4 month s | 2 month s | 4 month s | 2 month s | 4 month s |
| Hair density | 30% | 52% | 2% | 3.6 % | 31% | 51% | 4% | 10% |
| Hair calibre | 37% | 47% | 1.4% | 5.5% | 21% | 53% | 5% | 19% |