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A Study on Efficacy of Injectable Platelet Rich Fibrin for Androgenetic Alopecia in Males

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ABSTRACT

Androgenetic alopecia (AGA) is the most common cause of hair loss, affecting men and women worldwide, with characteristic patterns like a receding hairline or diffuse thinning. It results from a shortened hair growth cycle, producing thinner, shorter hairs. Androgenetic Alopecia can affect all races, but the prevalence rates vary. Prevalence is highest in Caucasians. As the anagen phase determines the hair length, the maximum length of the new anagen hair becomes shorter than that of its predecessor, leading to miniaturization and eventually a bald appearance. Conventional FDA Approved treatments for male AGA include topic/oral Minoxidil and oral Finasteride. Additional procedural therapies like Platelet-Rich Plasma (PRP) and hair transplantation are available for both genders. Injectable Platelet-Rich Fibrin (I-PRF), a second-generation bio material, provides sustained release of growth factors due to its fibrin network, enhancing therapeutic effects and reducing treatment sessions. To demonstrate the efficacy of I-PRF in the enhancement of hair growth among the male patients with Androgenetic alopecia and to measure the outcomes through follow up every month till 5 months. A prospective interventional study in which 20 patients with AGA were assessed clinically using Hamilton grading and by trichoscope. I-PRF is done monthly once and outcomes were assessed every month till week 20 using investigator assessment scale and patient scale. We identified 20 patients with AGA with duration of disease 3 year. At the end of 20 weeks of treatment, the hair count on USB microscope lens in one cm diameter was significantly high using this i-PRF treatment. The mean observer scale (2.70±0.47 vs 1.9±0.71., p=0.0002) and patient scale (3.5±0.60 vs 2.75±0.78., p=0.0016) was significantly high. I-PRF treatment once 4 weekly as a single modality of treatment in patients with AGA was very effective in the enhancement of hair growth among the male patients with AGA.

INTRODUCTION

Androgenetic alopecia (AGA) is the most frequent form of alopecia. It shows progressive hair loss, usually in a pattern distribution[1]. The onset may be at any age following puberty and the frequency increases with age. Androgenetic Alopecia can affect all races, but the prevalence rates vary. Prevalence is highest in Caucasians[2]. By the age of 70 or beyond, 80% of Caucasian men and up to 40% of women have signs of AGA[1]. In the Indian context, a population-based study of 1005 subjects showed a 58% prevalence of AGA in males aged 30-50 year. It is postulated that AGA results from an alteration in the hair cycle dynamics due to stepwise miniaturization of the hair follicle leading to the vellus transformation of the terminal hair follicle where the duration of anagen phase gradually decreases that of telogen phase increases[2,3]. Among the many treatments available, authorized treatments by the USFDA for AGA include topical Minoxidil 2% for women and topical Minoxidil 5% and oral type II 5-alpha-reductase inhibitor Finasteride (1 mg / day) for men. Platelet-rich concentrates represents new biotechnology that is part of the growing interest in tissue engineering and cellular therapy. Hair transplantation, a surgical method of hair restoration, is an option for male and female patients with substantial hair loss. Injectable PRF (Platelet-Rich Fibrin) is a second-generation biomaterial containing lymphocytic growth factors, type I collagen and platelet growth factors, similar to PRP[5]. It initially remains in liquid form for about 20 minutes, after which fibrin polymerization occurs, forming a solid membrane[6] with cellular components embedded in the mesh. This structure enables a gradual and sustained release of growth factors over time, extending its therapeutic effects and reducing the need for frequent sessions[7].

MATERIALS AND METHODS

This prospective interventional study included 20 patients and was conducted at Outpatient Department with Androgenetic Alopecia and they are selected based on inclusion and exclusion criteria of one year duration, approved by the ethics committee. Inclusion criteria includes cases with AGA (male pattern hair loss) of Hamilton grade III-IV, Age criteria: 25-40 years of age. Exclusion criteria includes, Patients on anti-coagulants over the last 1 week, Patients with Anaemia, Diabetes, Infections, Bleeding disorders, Patients who do not give consent, Over realistic patients and patients unavailable for follow up. The methodology for the study on i-PRF for AGA involves the following steps: The participants were briefed about the nature of the study. The participants expressing their willingness to participate in the study were enrolled after obtaining written informed consent. Participants were interviewed for demographic data such as age, history of AGA, personal history and family history. Further participants scalp hair grading i.e Norwood-Hamilton scale was determined. Trichoscopic findings were noted and pictures were saved. These findings were recorded on a pre designed proform. Injectable Platelet rich fibrin (I-PRF) preparation includes, Under all aseptic precautions, 20 ml of whole venous blood is withdrawn from the antecubital vein and is collected into two 10 ml sterile conical bottom centrifuge plastic tubes[3,4]. No anticoagulant is added to the tubes. The tubes are then immediately placed diametrically opposite each other inside the centrifuge fitted with a bucket-handle type of rotor (Remi R4c model) and centrifuged at 700 rpm for four minutes. The tubes are removed and the upper yellow-orange coloured liquid obtained is injectable PRF. For every 10ml of blood, approximately 1-1.5ml of injectable PRF can be produced[4].

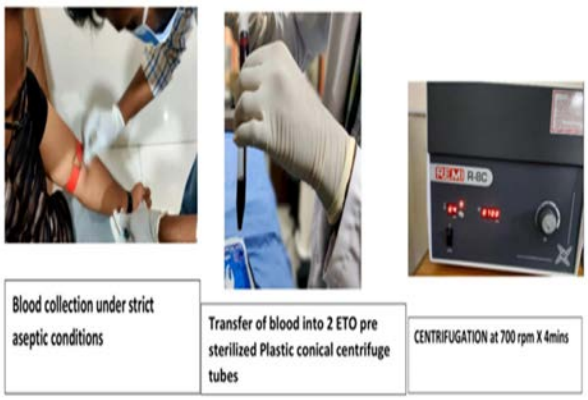

Fig. 1: Blood Collection Under Strict Aseptic Conditions, Transfer of Blood Into 2 ETO Pre Sterilize Plastic Conical Centrifuge Tubes. Centrifugation at 700rpmX4mins

Fig. 2: Post Centrifugation: Upper Most Yellow-Orange Coloured Liquid Obtained is Injectable PRF(I-PRF). Inter Follicular Injections off I-PRF by Point-by-Point Nappage Method

The produced i-PRF is given with Inter D-follicular injections once every 4 weeks for 20 weeks.

Statistical Analysis: Data will be entered in Microsoft Excel spread sheet, analysis will be done using SPSS VERSION 26. Paired t test will be used as test of significance for categorical data. Statistical significance will be considered if p-Value is <0.05.

RESULTS AND DISCUSSIONS

The present 2 year prospective interventional trial was conducted in Department of DVL, at a tertiary health care center, Eluru, West Godavari, Andhra Pradesh, for the period of 2 years was done from September 2019 to August 2021. A total of 20 men who presented with AGA were treated with i-PRF. Among the total 20 patients, 12 patients were in the age group of 16-25 years. The mean age was 26.55 with a standard deviation of 5.7 patients were in the age group of 26-35 years. 1 patient was in the age group of 36-45 years. The mean duration of disease is 3.054 years with a standard deviation of 2.73 year. In the present study at 20 weeks post treatment hair count on dermoscopic evaluation in one cm diameter was significantly high with i-PRF treatment (38.05±4.58).

Table 1: Mean Units with Different Hair Follicles at 0 Week and at Week 20

Follicles	At Week 0 Mean	At Week 0 S.D	At week 20 Mean	At Week 20 S.D
1	10.25	2.07	10.3	3.85
2	4.35	1.41	8.85	1.79
3	1.56	0.52	3.42	1.60
4	-	-	1.3	0.48
5	-	-	1.00	0.00

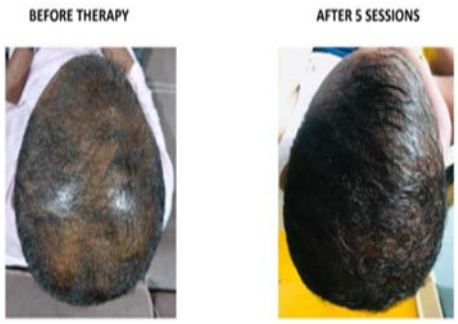

Fig. 3: Clinical and Trichoscopic Images of a Patient Before and After I-PRF. Clinical Images Before and After I-PRF

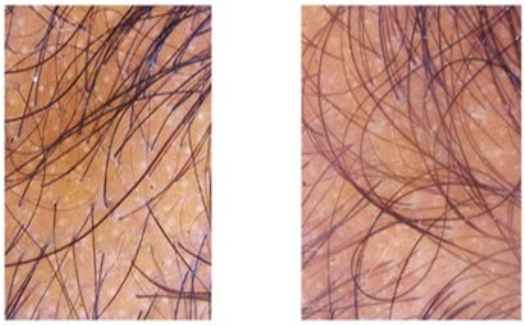

Fig. 4: Results After 5 Sessions of I-PRF in a Grade IV Patients Clinically and Dermoscopically with Decreased Honey Comb Pattern and Increased FU with 2 and 3 Hairs Compared to Pre Treatment Image

Androgenetic alopecia (AGA), a progressive hair loss condition characterized by follicular miniaturization and decreased hair density, poses significant psycho social challenges. Conventional treatments, including topical minoxidil and oral finasteride, often have variable efficacy and potential side effects. In recent years, regenerative approaches like injectable platelet-rich fibrin (i-PRF) have shown promising results in addressing hair follicle regeneration and improving hair density in AGA patients. I-PRF is a second-generation autologous platelet concentrate prepared without anticoagulants, resulting in a natural fibrin network and sustained release of bio active growth factors. Growth factors such as platelet-derived growth factor (PDGF), vascular endothelial growth factor (VEGF), transforming growth factor-beta (TGF-ß) and insulin-like growth factor-1 (IGF-1) play a critical role in promoting angiogenesis, cellular proliferation and differentiation of dermal papilla cells. These effects contribute to the stimulation of dormant hair follicles, reversal of follicular 9 miniaturization and improved peri follicular vascularization[8] conducted a randomized controlled trial on 60 male AGA patients. The study demonstrated a significant increase in hair density (measured by trichoscopic analysis) in the i-PRF group compared to baseline and a saline control group. The improved density was maintained over six months, highlighting the long-lasting effects of i-PRF therapy. A split-scalp study by Gkini[9], compared i-PRF with PRP in AGA patients. The i-PRF-treated area showed a more pronounced increase in hair thickness and follicle size compared to PRP-treated areas, likely due to the superior fibrin scaffold and sustained release of growth factors. Siah *et al.* (2021) reported that i-PRF injections led to significant activation of dormant hair follicles in AGA patients, as evidenced by increased anagen-to-telogen hair ratios. Histological analysis revealed increased peri follicular angiogenesis and dermal papilla cell activity in treated areas. Sustained Growth Factor Release: The fibrin matrix in i-PRF enables a prolonged release of bio active molecules, leading to more consistent stimulation of hair follicles over time Dohan Ehrenfest[10]. Absence of Anticoagulants: The lack of anticoagulants in i-PRF ensures the formation of a natural fibrin network, enhancing cellular interaction and growth factor retention (Miron *et al.,* 2017). Ease of Application: I-PRF's liquid consistency allows for uniform delivery into the scalp, ensuring even treatment distribution. I-PRF has also demonstrated synergistic effects when combined with other modalities. For instance, a study by El-Hadidi[11] highlighted the enhanced efficacy of i-PRF combined with micro needling, with greater improvements in hair density and patient satisfaction scores compared to either treatment alone.

CONCLUSION

I-PRF offers a safe, autologous and minimally invasive approach to managing AGA. Clinical studies consistently show its efficacy in improving hair density, thickness and follicular health. As a regenerative therapy, I-PRF holds significant potential for long-term management of AGA, particularly in patients seeking alternatives to pharmacological treatments. Further large-scale, multi-center trials are needed to establish standardized protocols and optimize treatment outcomes.

REFERENCES

1. Kanti, V., A. Messenger, G. Dobos, P. Reygagne and A. Finner et al., 2018. Evidence-based (S3) guideline for the treatment of androgenetic alopecia in women and in men-short version. J. Eur. Acad. Dermatol. Venereology, 32: 11-22.
2. Kaliyadan, F., A. Nambiar and S. Vijayaraghavan, 2013. Androgenetic alopecia: An update. Indian J. Dermatol., Venereology, Leprology, Vol. 79 .10.4103/0378-6323.116730.
3. Paus, R. and G. Cotsarelis, 1999. The Biology of Hair Follicles. New Engl. J. Med., 341: 491-497.
4. Olsen, E.A., A.G. Messenger, J. Shapiro, W.F. Bergfeld and M.K. Hordinsky et al., 2005. Evaluation and treatment of male and female pattern hair loss. J. Am. Acad. Dermatol., 52: 301-3011.
5. Zhang, J., C. Yin, Q. Zhao, Z. Zhao, J. Wang, R.J. Miron and Y. Zhang, 2020. Anti-inflammation effects of injectable platelet-rich fibrin via macrophages and dendritic cells. J. Biomed. Mater. Res. Part A, 108: 61-68.
6. Bai, M.Y., C.W. Wang, J.Y. Wang, M.F. Lin and W.P. Chan, 2017. Three-dimensional structure and cytokine distribution of platelet-rich fibrin. Clinics, 72: 116-124.
7. Shashank, B. and M. Bhushan, 2020. Injectable Platelet-Rich Fibrin (PRF): The newest biomaterial and its use in various dermatological conditions in our practice: A case series. J. Cosmet. Dermatol., 20: 1421-1426.
8. Miron, R.J. and N.R. Pinto, et al., 2017. Platelet-rich fibrin (PRF): A second-generation platelet concentrate. Clinical Oral Implants Research., 28: 10-20.
9. Gkini, M.A., et al., 2022. Comparison of PRP and i-PRF for hair regeneration. Aesthetic Plastic Surgery., 12: 33-40.
10. Dohan, E.D.M., et al., 2019. Autologous PRF: Applications in regenerative medicine. Blood Coagulation Reviews., 31: 15-22.
11. El-Hadidi, T., et al., 2022. Combined i-PRF and microneedling therapy for AGA. Dermatological Advances., 8: 24-29.