

Efficacy Differences of Platelet Rich Plasma for Treatment of Androgenetic Alopecia between Men and Women

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ABSTRACT

Background: Almost 50% males face a health issue called androgenic alopecia and even almost 21 million women are affected too.

Aim: To determine the efficacy difference of platelet rich plasma for treatment of androgenic alopecia among patients.

Study design: Quasi experimental method.

Methodology: In order to collect the data, the purposive sampling technique was used. Enrolled patients (n=102) were divided into two groups. Each group received PRP injections after every 1 month for 3 months. Follow up was done at 3 and 6 months. Results were assessed by standard photographs and Hamilton Norwood scale for men and Ludwig scale for women. SPSS v 23 evaluated data. Chi-square test was used to compare the efficacy of Platelet Rich Plasma for treatment of androgenic alopecia between genders.

Results: Mean age of the study participants was 27.1±4.5 years. Independent sample t test revealed that the mean age of the female participants was significantly higher than male participants ($p < 0.001$). There was 100% response rate of PRP treatment for androgenic alopecia in both genders.

Practical Implication: This study helped researchers in exploring the efficacy of PRP as a remedy for hair re-growth as it is cheap and safe. Secondly, it added to local literature regarding androgenic alopecia.

Conclusion: It was concluded that sub-dermal PRP injections were effective among both genders with androgenic alopecia.

Keywords: Efficacy, Androgenic alopecia, Response Rate, Treatment Options and Plasma Rich Proteins.

INTRODUCTION

Almost 50% males face a health issue called androgenic alopecia and even almost 21 million women are affected too¹. This disease causes hair loss followed by replacement of terminal hairs by shorter and finer hairs progressively over scalp². According to literature review, males face hair loss over crown while sparing posterior and lateral scalp margins whereas in females, there is episodic hair shedding resulting in low hair volume³. This disease irrespective of sex, influences many aspects of its victim's life both socially and emotionally thus causing distress and depression⁴.

Multiple medical treatment options for androgenic alopecia have been approved by Food and Drug Administration (FDA) that include topical minoxidil and oral finasteride but unfortunately, these have low efficacy and have several side effects as shown by literature.³ However, other options include laser therapy, scalp micro-needling, hair meso-therapy and hair transplantation.⁴ Surgical transplantation is another option for hair restoration but it is an invasive procedure and is expensive. Hence there is a need for some alternative treatment options⁵. On the other hand, Platelet Rich Plasma (PRP) is an effective treatment option for this disease as it increases that hair thickness and density in both genders as shown by literature review⁶. It contains various growth factors and proteins like insulin Like growth factor, platelet derived growth factor, vascular endothelial growth factor, transforming growth factor and interleukins that cause acceleration of tissue repair⁷⁻⁹. These growth factors activate stem cells thus cause new follicles development and promote neo-vascularization^{9,10}.

One previous study enrolled patients and compared them in terms of improvement in hair re-growth when treated with PRP injections. Their results showed that for men, PRP significantly increased hair density from baseline (pooled sample size [N] = 250, mean difference [MD] = 25.83, 95% confidence interval [CI]: 15.48-36.17, $P < .00001$) and significantly increased hair diameter (n=123, MD= 6.66, 95% CI: 2.37-10.95, $P = .002$). For women, PRP significantly increased hair diameter (n=95, MD= 31.22, 95% CI: 7.52-54.91, $P = .01$), but not hair density. Hence they concluded that it is an effective treatment option for hair re-growth however, by increasing amount of platelets its efficacy can be increased¹¹.

Hair restoration surgery is a more permanent option¹¹⁻¹³, yet for many, the cost is prohibitive. Due to the increase in incidence of baldness, there is a need to find new ways that are efficacious and fruitful in re-growth of hairs among males and females. This study helped researchers in exploring the efficacy of PRP as a remedy for hair re-growth as it is cheap and safe. Secondly, it added to local literature regarding androgenic alopecia. Goal of present study was to determine the efficacy difference of platelet rich plasma for treatment of androgenic alopecia among male and female patients.

METHODOLOGY

The present study was based on Quasi experimental method as it lacked the experimental restraint. The main highlight in this study was on real happening cases. Present study was conducted in the department of Dermatology Sheikh Zayed Hospital Rahim Yar Khan-Pakistan. Ethical review certificate was obtained prior to start of study from hospital. In order to collect the data, the purposive sampling technique was used. Enrolled patients having androgenic alopecia (n=102) were divided into two groups. Each group received PRP injections after every 1 month for 3 months. Follow up was done at 3 and 6 months. PRP was prepared at centrifuge speed of 2500 RPM for 15-20 min. Ca-Gluconate was used as an activator. 10 units of injection Ca-Gluconate in insulin syringe and 90 units of PRP were injected. PRP injections were given under local anesthesia. Patients were assessed using Hamilton Norwood scale (men) And Ludwig scale (women) in OPD. Patients (18-40years) with either gender having androgenic alopecia were enrolled. Patients having bleeding disorders, inflammatory conditions of scalp or hypersensitivity to PRP and if taken any other treatment for androgenic alopecia during last 1 month were ruled out.

Statistical analysis: Data was analyzed in SPSS version 23.0. Mean ± SD were given for numeric data i.e., age and duration of hair loss. The frequency and percent were calculated for categorical data i.e., gender, grades of scores and treatment response. Chi-square test was used to compare the efficacy of Platelet Rich Plasma for treatment of androgenic alopecia between both genders. A p-value ≤ 0.05 was considered significant.

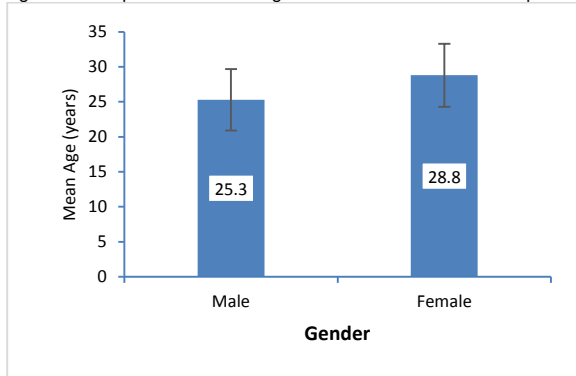
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RESULTS

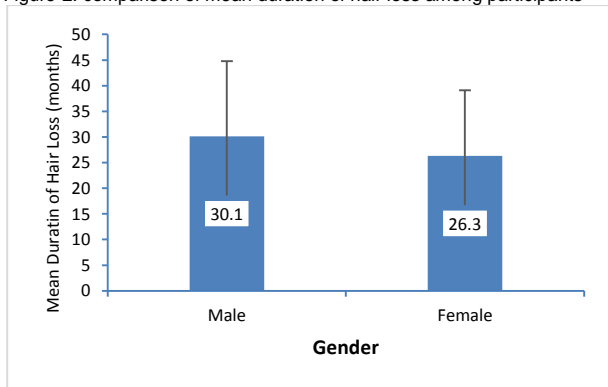
In this study, there were 51 males and 51 females. The mean age of the study participants was 27.1±4.5 with age range from 18 to 40 years. Independent sample t test revealed that the mean age of the female participants was significantly higher than male participants (p < 0.001) as shown in figure-1.

Figure-1: Comparison of mean age between male and females participants



The mean duration of hair loss in males was 30.1±14.7 and the mean duration of hair loss in females was 26.3±12.8 months as shown in figure-2.

Figure-2: comparison of mean duration of hair loss among participants



The grade of Hamilton & Norwood and Ludwig scale for both male and female patients at baseline, 3 month and 6 months was given in table-1.

Table-1: Comparison of grade of Hamilton and Norwood and Ludwig Scale between male and female patients

Interval	Scales	Male	Female
Baseline	I	1 (2.0%)	8 (15.7%)
	II	19 (37.3%)	40 (78.4%)
	III	29 (56.9%)	3 (5.9%)
	IV	2 (3.9%)	0 (0.0%)
3 months	I	21 (41.2%)	39 (76.5%)
	II	27 (52.9%)	12 (23.5%)
	III	3 (5.9%)	0 (0.0%)
6 months	Improved from I	0 (0.0%)	16 (31.4%)
	I	41 (80.4%)	33 (64.7%)
	II	10 (19.6%)	2 (3.9%)

There was 100% response rate of PRP treatment for androgenic alopecia in both genders as shown in table-2. Number and thickness of hair both increased in all the male patients. However, in female thickness was observed as compared to the number of hair.

Table 2: Efficacy differences of platelet rich plasma for treatment of androgenic alopecia between male and female

Efficacy	Male	Female
Responder	51(100%)	51(100%)
Non-Responder	0	0

DISCUSSION

Multiple medical treatment options for androgenic alopecia has been approved by Food and Drug Administration (FDA that include topical minoxidil and oral finasteride but unfortunately, these have low efficacy and have several side effects as shown by literature.³ However, other options include laser therapy, scalp micro-needling, hair meso-therapy and hair transplantation⁴. Surgical transplantation is another option for hair restoration but it is an invasive procedure and is expensive. Hence there is a need for some alternative treatment options.

In present study, 102 participants were enrolled that included both genders. Both males and females were equal in number. However, in many previous studies, more males were enrolled with androgenic alopecia in comparison to females thus our enrollment method was different with other studies^{10,11}.

Most male patients presented with androgenic alopecia were in grade-III (56.9%) while females were in grade-II (74.8%) at time of enrollment according to Hamilton and Norwood Scale & Ludwig Scale. Similarly, males were in grade III and IV at time of presentation while females were in grade-II. Our results at time of enrollment were similar with another study that majority males were severely affected (high grade of baldness) in comparison to females^{11,12}.

In present study, almost 80.7% male and 64.7% females presented with alopecia improved baldness with treatment (PRP) given at 3 and 6 months. They improved their grades respectively according to scales used. Similarly, another study showed that 82% patients had negative pull test with average number of three hairs. A significant reduction in hair loss was observed between first and fourth injection and improved their grade of severity.¹³ Hence, our results were in line with previous study.

One previous study enrolled patients and compared them in terms of improvement in hair re-growth when treated with PRP injections. Their results showed that for men, PRP significantly increased hair density from baseline (pooled sample size [N] = 250, mean difference [MD] = 25.83, 95% confidence interval [CI]: 15.48-36.17, P < .00001) and significantly increased hair diameter (n=123, MD=6.66, 95% CI: 2.37-10.95, P= .002). For women, PRP significantly increased hair diameter (n=95, MD = 31.22, 95% CI: 7.52-54.91, P= .01), but not hair density. Hence they concluded that its an effective treatment option for hair re-growth however, by increasing amount of platelets its efficacy can be increased¹¹.

In present study, all males and females responded to treatment given for baldness. Hence it was seen that 100% response rate was present. Similarly, one previous study showed that majority of the enrolled patients (82%) were satisfied with treatment (PRP) given for baldness. Only 18% were dissatisfied with treatment and results.¹⁴

In present study only single treatment modality like PRP was used and compared among genders. However, in many different studies two or more treatment options were used and different results were seen.¹⁴⁻¹⁷ Hence, present study was different and limitations.

Limitations of study: Financial constrains and limited resources with no genetic workup and long follow-ups added to limitations. Only single treatment modality was used and compared between genders. No evaluation of quality of life among participants was done.

CONCLUSION

It was concluded that sub-dermal PRP injections were effective among both genders with androgenic alopecia. Hence, PRP injection is a simple, cheap and feasible treatment option for hair

loss so it should be offered to all patients suffering baldness at our clinical setups.

Author's contribution: RA, TH & MKS: Overall supervision and Write up and literature review, NH, ZA & GER: Literature review help in write-up.

Conflict of interest: None

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