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Original Research Article

Intralesional triamcinolone acetonide versus platelet rich plasma: a comparative study in the treatment of alopecia areata of scalp

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ABSTRACT

Background: Alopecia areata (AA) is a chronic inflammatory disease characterized by nonscarring hair loss involving any hair-bearing surface of the body. The current therapy for AA is not curative but rather aimed at controlling or limiting the pathogenic process. Corticosteroids are the most popular drugs used, however localized atrophy is a common complication, particularly with triamcinolone. Promoting hair growth by application of autologous blood extracted platelet rich plasma (PRP) is a simple, yet effective procedure. The aim of the study was to evaluate and compare the efficacy of intralesional triamcinolone acetonide (5 mg/ml) with intralesional PRP in the treatment of two different scalp AA patches of same individual.
Methods: A total of 30 patients having ≥2 patches of AA were randomized and given two separate modalities of treatment in two different patches and divided in Group I, treated with intralesional triamcinolone acetonide (5 mg/ml) and Group II, treated with PRP. Interval time between every follow-up was 3 weeks and four such follow-ups were done. Hair regrowth was calculated according to Mac Donald Hull and Norris grading system at every follow-up and was compared with the initial grading.
Results: Group I patches, treated with triamcinolone acetonide have the significantly higher mean grading score than the group II patches, treated with PRP at each follow up.
Conclusions: Intralesional triamcinolone acetonide is more efficacious than intralesional PRP in the treatment of scalp alopecia areata with no recurrences and very few adverse effects like atrophy and hypopigmentation.

Keywords: Alopecia areata, Triamcinolone acetonide, PRP

INTRODUCTION

Alopecia areata (AA) is characterized by non-scarring alopecia involving the scalp and/or body without any clinical inflammatory signs.[1] It is frequently observed by dermatologists and accounts for 25% of all the alopecia cases. It accounts for 0.7% of the new dermatology OPD cases in India.[2]

The disease manifests as a coin shaped patch or band-like lesion over occipital (ophiasis pattern) or forehead (reverse ophiasis pattern) region, which may progress into alopecia totalis or universalis. It is often triggered by psychological stress and has limited treatment options.[3]

The current therapy is not curative, but rather aimed at controlling or limiting the pathogenic process. Most of the effective therapies being either immunosuppressive or

immunomodulatory, all associated with varying side effects. Corticosteroids are being commonly used but localized atrophy is a frequently encountered problem.[4] On the other hand platelet rich plasma (PRP), an autologous preparation of platelets in concentrated plasma has attracted attention in several medical fields because of its ability to promote wound healing. Hence, promoting hair growth by application of autologous blood extracted platelet rich plasma is a simple, yet effective procedure in the treatment with no danger of allergic reactions.[5]

METHODS

This interventional comparative study with pre-post treatment comparison of 30 patients of AA having ≥2 patches, was carried out in the dermatology department of tertiary care center at Dr. D. Y. Patil Hospital, Pune, southern India from July 2016 to September 2018. The inclusion criteria included all patients between 20-40 years, both sexes, diagnosed clinically as alopecia areata with ≥2 patches and those who have not taken any form of treatment in the last 6 months. Exclusion criteria were unwilling patient, pregnancy, lactation, alopecic patient other than alopecia areata and having active infection at the local site. Institute Ethics Committee Clearance was obtained before the start of study.

Patients were randomized and given two separate treatment modalities in two different patches of the same individual. One patch was selected and treated with intralesional triamcinolone acetonide (Group I) while another patch with PRP (Group II). Six follow-ups were done with three weeks interval time. Remaining patches were treated with intralesional triamcinolone acetonide only and were not included in the study group.

In Group I, intralesional triamcinolone acetonide (5mg/ml) was injected into deep dermis or upper subcutaneous tissue using a 0.5 inch long 30-gauge needle at the sites, 1 cm apart and 0.1 ml into each site.

In Group II, under strict aseptic conditions, 10 ml of patient's own venous blood was collected in a sterile vaccutainer containing anticoagulant sodium citrate. This, collected whole blood was centrifuged to separate the PRP by double spin centrifugation where initially it was centrifuged by 'light spin' centrifugation (1600 rpm for 10 minutes) leading to supernatant plasma which was further centrifuged by 'heavy spin' centrifugation (3400 rpm for 7 minutes). Approximately three-fourth of the supernatant plasma was discarded and the resultant buffy coat was used as PRP. Retrograde injection of PRP was given deep-to-surface at a rate of 0.05–0.1 ml/cm^2 one centimeter apart.

Results were assessed and compared at each follow up based on the Mac Donald Hull and Norris grading system.[6] The grading system followed is as under:

Grade 1: regrowth of vellus hair
Grade 2: regrowth of sparse pigmented terminal hair
Grade 3: regrowth of terminal hair in clusters
Grade 4: complete regrowth of terminal hair over alopecia patch.

Quantitative variables were described using percentages, ranges, means and standard deviations for statistical analysis. Student's independent t-test, analysis of variance test and Spearmen's correlation analysis were performed using the Statistical Package for the Social Sciences, SPSS version 20 (SPSS Inc., Chicago, IL, USA) as appropriate. A two-tailed probability value of 0.05 or less was considered significant.

RESULTS

Out of total 30 patients (male 22, female 8), 16 (53.33%) belonged to age group of 20 to 30 years and 14 (46.67%) of age group 31 to 40 years (Table 1).

Table 1: Gender and age distribution.

		No of cases	Percentage (%)
Age (in years)	20–30	16	53.33
	31–40	14	46.67
Sex	Male	22	73.33
	Female	8	26.67

Table 2: Significant past history, onset, initial site, pattern and border of study patches.

		No of cases	Percentage (%)
Past history	Similar lesion	10	33.33
	Any other skin lesion	1	3.33
	Any treatment	4	13.33
	Atopy	4	13.33
Onset	Sudden	22	73.33
	Gradual	8	36.67
Initial site	Scalp	23	76.67
	Beard	7	23.33
Pattern	Patchy	22	73.33
	Ophiasis	3	10
	Reticulate	3	10
	Diffuse	2	6.67
Border	Well defined	20	66.67
	Ill defined	10	33.33

A majority (22; 73.33%) presented with sudden onset of hair loss of only few days duration. Hair loss initially started over scalp in 23 (76.67%) cases and over beard in 7 (23.33%) cases. A majority (25; 83.33%) had the acute disease onset of less than 6 months duration. Past history of similar patch was seen in 10 (33.33%); atopy in 4 (13.33%); treatment history prior to six months in 4, out of which 3 received allopathy and 1, homeopathy. The

most common pattern observed was patchy in 22 (73.33%); ophiasis in 3 (10%); reticulate in 3 (10%) and diffuse in 2 (6.67%) patients. Majority (20, 66.67%) had well defined border while 10 (33.33%) presented with ill-defined border (Table 2). Nail changes were observed in 2 (6.67%) patients in the form of pitting. On dermoscopy, 22 (73.33%) showed yellow dots, 17 (56.66%) had clustered short vellus hairs, 14 (46.66%) showed black dots; 10 (33.33%) had broken hair and 7 (23.33%) showed exclamation mark hair (Table 3).

The mean grading score in the study patches treated with triamcinolone acetonide at first follow-up was 1.33; at second, 2; at third, 2.73 and at fourth follow-up was 3.57 (Table 4).

Table 3: Nail changes and dermoscopic findings in our study group.

		No of cases	(%)
Nail changes	Pitting	2	6.67
	No pitting	28	93.33
Dermoscopic findings	Yellow dots	22	73.33
	Black dots	14	46.66
	Broken Hair	10	33.33
	Short vellus hair	17	56.66
	Exclamation mark	7	23.33

Table 4: Comparison of mean grading score between group I and group II at every follow-up.

Follow-ups	Group I			Group II			MW test Z value	P value
	N	Mean grading score	SD	N	Mean grading score	SD		
1st follow up	30	1.33	0.479	30	1.07	0.254	2.56	0.01
2nd follow up	30	2	0.695	30	1.33	0.606	3.72	<0.0001
3rd follow up	30	2.73	0.740	30	1.90	0.662	3.99	<0.0001
4th follow up	30	3.57	0.568	30	2.63	0.718	4.52	<0.0001

Table 5: Complication and recurrence rate in both the groups after 3 months of treatment.

Parameter	Group I (n=30)	Group II (n=30)	Z value	P value
Complication	3 (10)	1 (3.33)	1.04	0.30
Recurrence	0 (0)	3 (10)	1.83	0.068

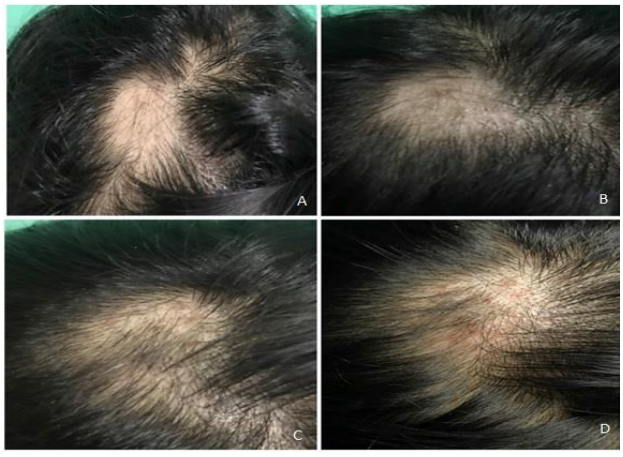

Figure 1: Response to intralesional triamcinolone acetonide: (A) initial, (B) regrowth of sparse pigmented terminal hair at 3 weeks, (C) terminal hair in clusters at 9 weeks and (D) complete regrowth of terminal hair at 3 months.

According to Mac Donald Hull and Norris grading system, Group I showed grade 4 (excellent) response in 18 (60%) patients while grade 3 (good) response in 11 (36.66%) on treatment with intralesional triamcinolone acetonide on fourth follow-up (Figure 1).

The mean grading score in the study patches treated with PRP at first follow-up was 1.07; at second, 1.33; at third, 1.90 and at fourth follow-up was 2.63. Our study showed significant improvement of mean grading score in the treated patches of both the groups at subsequent follow-ups (Table 4).

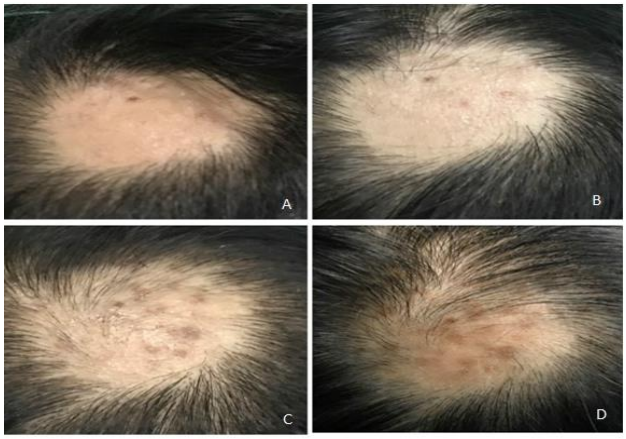

Figure 2: Response to platelet rich plasma: (A) Initial, (B) no changes at 3 weeks, (C) regrowth of sparse pigmented terminal hair at 9 weeks and (D) terminal hair in cluster at 3 months.

On treatment with PRP (group II), grade 4 (excellent) response was seen in 4 (13.33%) patients and 11 (36.66%) showed grade 3 (good) response at fourth follow-up (Figure 2).

Group I showed the significantly higher mean grading score ($p<0.0001$) as compared to group II at each follow-up.

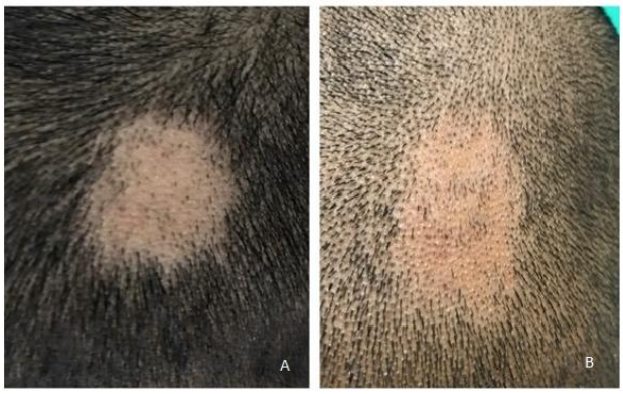

Figure 3: Comparison of hair growth after 3 months - (A) terminal hair in clusters (group I); (B) while sparse pigmented terminal hair (group II).

Figure 4: Group I patch: (A) sparse pigmented terminal hair at the border after first follow up and (B) complete regrowth of terminal hair after fourth follow up.

The mean grading score of 3.57 is significantly higher in group I (Figure 3, 4 and 6) patches as compared to group II (2.63) (Figure 3, 5 and 7) at fourth follow-up.

The adverse effects like atrophy and hypopigmentation was seen in 3 (10%) cases of group I and 1 (3.33%) of group II. Recurrence was seen in 3 (10%) patients of group II and none in group I, despite the continuation of treatment (Table 5).

In our study, intralesional triamcinolone acetonide was more efficacious in the treatment of scalp alopecia areata as compared to intralesional PRP.

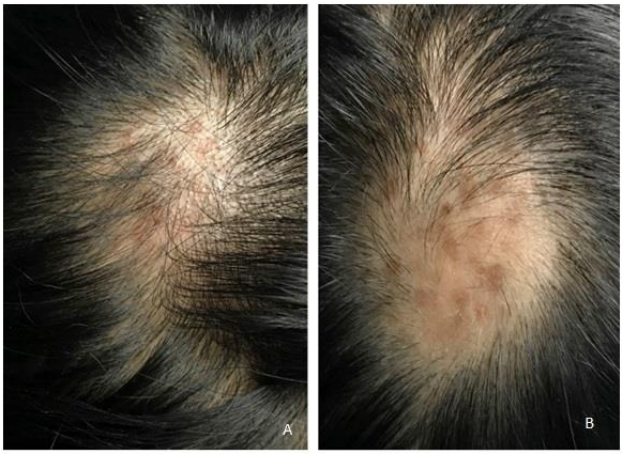

Figure 5: Group II patch: (A) regrowth of vellus hair after first follow up, (B) terminal hair in clusters after fourth follow up.

Figure 6: Group I patch: (A) regrowth of vellus and terminal hair after first follow up (B) and complete regrowth of terminal hair after fourth follow up.

Figure 7: Group II patch: (A) regrowth of vellus hair after first follow up, (B) terminal hair in clusters after fourth follow up (B).

DISCUSSION

In the present study, more than half of the AA patients (16; 53.33%) belonged to the third decade and 14 (46.67%), to the fourth decade of life. The similar findings were also reported by two Indian studies carried out by Kuldeep et al (32, 41%) and Sardesai et al (14, 40%) which showed the majority of the AA in the third decade of life.[7,8]

Our study showed a marked male preponderance (M:F=3:1). However, Bhat et al (2:1) and Sharma et al (2:1) showed a lower male preponderance as compared to our study.[9,10]

In the present study, majority cases (22; 73.33%) reported sudden onset of hair loss of only few days duration. The similar findings were also reported by Shumez et al.[11] However, it is quite difficult to predict disease course due to spontaneous remissions as observed in 5% of the cases in a Polish study.[12]

AA initially started over scalp in 23 (76.67%) patients of our study and over beard in 7 (23.33%). The findings are comparable to a study carried out by Al-Mutairi et al which reported patchy alopecia affecting scalp as the most common type.[13]

An increased prevalence of thyroid diseases (8%), vitiligo (4%) and diabetes mellitus (2%) in AA patients were reported in a British study by Muller and Winkelmann in 1963 which was confirmed by Canliffe et al.[14,15] While in our study only one patient had vitiligo, 10 (33.33%) gave past history of similar patch, 4 (13.33%) had atopy and none was associated with thyroid disorder or diabetes mellitus. An association with atopy was seen in 18% cases in a study by Sharma et al.[10]

The pattern of hairloss in AA of our study was patchy in 22 (73.33%) cases, ophiasis in 3 (10%), reticulate in 3 (10%) and diffuse in 2 (6.67%) cases. Our findings coincided with that of the Indian study by Hegde et al where patchy pattern was seen in 55 (73.3%) followed by ophiasis in 9 (12%); sisaphio in 3 (4%); reticulate in 2 (2.7%) and diffuse in 3 (4%) cases.[16]

A majority (20, 66.67%) of the patients in our study had well defined border and 10 (33.33%) presented with ill-defined border.

Nail changes in the form of pitting was observed in 2 (6.67%) patients of our study. Other nail changes like striations, Beau's lines and dystrophy including pitting have been reported in 7-66% of AA patients in various studies.[17,18]

On dermoscopy, a majority 22 (73.33%) had yellow dots, 17 (56.66%) had clustered short vellus hairs, 14 (46.66%) with black dots, 10 (33.33%) had broken hair and 7 (23.33%) were with exclamation mark hairs. This is comparable to a study carried out by Inui et al. which showed yellow dots in 63.7%, tapering hairs (exclamation mark hairs) in 31.7%, black dots in 44.3%, broken hairs in 45.7% of AA cases.[19]

The mean grading score in the study patches treated with triamcinolone acetonide at first follow-up was 1.33; at second, 2; at third, 2.73 and at fourth follow-up were 3.57.

After 3 months of treatment with intralesional triamcinolone acetonide (group I), according to Mac Donald Hull and Norris grading system, grade 4 (excellent) response was seen in 18 (60%) patients while 11 (36.66%) patients showed grade 3 (good) response, with the mean grade score of 3.57 at fourth follow-up. The National Guidelines from British Association of Dermatologists recommend triamcinolone acetonide (5-10 mg/ml) intradermally at 2-6 weeks interval as the first line treatment with approximate success rates of 60-75%. Abell et al. reported the similar findings of hair regrowth in 52 (62%) patients at 12 weeks interval after three injections of triamcinolone acetonide, using the Porto Jet needleless device.[20] Another study by Chang et al reported 6 patients with AA involving more than 50% of the scalp, responded favorably with intralesional corticosteroids.[21] Recurrence was none in group I patches.

The mean grading score in the study patches treated with PRP at first follow-up was 1.07; at second, 1.33; at third, 1.90 and at fourth follow-up was 2.63.

On treatment with PRP (group II) after 3 months, grade 4 (excellent) response was seen in 4 (13.33%) patients and 11 (36.66%) showed grade 3 (good) response at fourth follow up, with the mean grade score of 2.63. Recently a randomized double bind, placebo and active controlled, half-head Italian study evaluated PRP in 45 patients of alopecia areata suggesting that PRP may serve as a safe and effective treatment option in AA, and calls for more extensive controlled studies with this method.[22] Another American study used PRP in a single patient of alopecia areata as mesotherapy, with good subjective results at 10-months follow-up.[23]

The mean grading score of 3.57 is significantly higher in group I patches as compared to group II (2.63) at fourth follow-up. The findings are comparable to an Indian study conducted by Ninama et al which reported 86.6% with grade 4 (excellent) response and 6.6%, grade 3 (good) response after 16 weeks of treatment with intralesional triamcinolone acetonide, while 26.6% with grade 4 (excellent) response and 46%, grade 3 (good) response on treatment with PRP and dermaroller.[24] Another Indian study by Agrawal et al also reported the response of intralesional triamcinolone acetonide (33.3%) for the treatment of scalp AA to be better than with intralesional PRP therapy (3.33%).[25] In a study by Shumez et al, PRP had an earlier response at the end of 6 weeks as compared to triamcinolone; however, this

difference was statistically insignificant which is opposite to index study result.[11]

Atrophy and hypopigmentation was seen in 3 (10%) cases of group I while 1 (3.33%) in group II. The side effects can be minimized by increasing the duration between the successive injections.

After 6 months of treatment, 3 (10%) patients in group II showed recurrence while none in group I, despite the continuation of treatment. In an Italian study by Tosti et al, the relapse rate of 37.5% was observed with steroids.[26]

Intralesional triamcinolone acetonide proves to be better than PRP in the treatment of AA with faster recovery, minimum adverse effects and no recurrences.

CONCLUSION

Alopecia areata is a disease of sudden onset with male preponderance and characteristic yellow dots on dermoscopy. Patches treated with intralesional triamcinolone acetonide had higher mean grading score than the patches treated with intralesional PRP, at every follow-up. Recurrence was seen only in PRP treated patches. In our study, intralesional triamcinolone acetonide was more efficacious than intralesional PRP in the treatment of scalp alopecia areata with no recurrence and very few adverse effects like atrophy and hypopigmentation. To the best of our knowledge, it is the first study in which two different treatment modalities were used on two different scalp AA patches of the same individual.

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Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Seetharam KA. Alopecia areata: An update. Indian J Dermatol Venereol Leprol. 2013;79:563-75.
2. Mishra A, Sharma RL, Mishra M. A study of clinical profile of alopecia areata in a tertiary care hospital in western Odisha. IAIM. 2017;4(5):26-30.
3. Pratt CH, King LE, Messenger AG, Christiano AM, Sundberg JP. Alopecia areata. Nature Rev Dis Primers. 2017;3:17011.
4. Kumaresan M. Intralesional steroids for alopecia areata. Int J Trichol. 2010;2(1):63-5.
5. Khatu SS, More YE, Gokhale NR, Chavhan DC, Bendsure N. Platelet-rich plasma in androgenic alopecia: Myth or an effective tool. J Cutan Aesthet Surg. 2014;7(2):107-10.
6. MacDonald Hull S, Norris JF. Diphencyprone in the treatment of long-standing alopecia areata. Br J Dermatol. 1988;119:367-74.
7. Kuldeep CM, Singhal H, Khare AK, Mittal A, Gupta LK, Garg A. Randomized comparison of topical betamethasone valerate foam, intralesional triamcinolone acetonide and tacrolimus ointment in management of localized alopecia areata. Int J Trichol. 2011;3:20-4.
8. Sardesai VR, Prasad S, Agarwal TD. A Study to Evaluate the Efficacy of Various Topical Treatment Modalities for Alopecia Areata. Int J Trichol. 2012;4:265-70.
9. Bhat YJ, Manzoor S, Khan AR, Qayoom S. Trace element levels in alopecia areata. Indian J Dermatol Venereol Leprol. 2009;75:29-31.
10. Sharma VK, Dawn G, Kumar B. Profile of alopecia areata in Northern India. Int J Dermatol. 1996;35:22-7.
11. Shumez H, Prasad PVS, Kaviarasan PK, Deepika R. Intralesional platelet rich plasma vs intralesional triamcinolone in thetreatment of alopecia areata: A comparative study. Int J Med Res Health Sci. 2015;4(1):118-22.
12. Brzezińska-Wcisło L, Wcisło-Dziadecka D, Meszyńska E, Lis-Święty A. New perspectives on the pathogenesis and treatment of hair disorders. Post Nauk Med. 2012;10:800-5.
13. Al-Mutairi N, Eldin ON. Clinical profile and impact on quality of life: Seven years experience with patients of alopecia areata. Indian J Dermatol Venereol Leprol. 2011;77:489-93.
14. Muller SA, Winkelmann RK. Alopecia areata. An evaluation of 736 patients. Arch Dermatol 1963;88:290-7.
15. Cunliffe WJ, Hall R, Stevenson CT, Weighman D. Alopecia areata, thyroid disease and autoimmunity. Br J Dermatol. 1969;81:877-81.
16. Hegde SP, Naveen KN, Athanikar SB, Reshme P. Clinical and dermatoscopic patterns of alopecia areata: A tertiary care centre experience. Int J Trichol. 2013;5(3):132–6.
17. Gandhi V, Baruah MC, Bhattacharaya SN. Nail changes in alopecia areata: incidence and pattern. Indian J Dermatol Venereol Leprol. 2003;69:114-5.
18. Kasumagic-Halilovic E, Prohic A. Nail changes in alopecia areata: frequency and clinical presentation. J Eur Acad Dermatol Venereol. 2009;23:240-1.
19. Inui S, Nakajima T, Nakagawa K, Itami S. Clinical significance of dermoscopy in alopecia areata: Analysis of 300 cases. Int J Dermatol. 2008;47:688-93.
20. Abell E, Munro DD. Intralesional treatment of alopecia areata with triamcinolone acetonide by jet injector. Br J Dermatol. 1973;88:55–9.
21. Chang KH, Rojhirunsakool S, Goldberg LJ. Treatment of severe alopecia areata with intralesional steroid injections. J Drugs Dermatol 2009;8:909–12.
22. Trink A, Sorbellini E, Bezzola P, Rodella L, Rezzani R, Ramot Y, et al. A randomized, double-blind, placebo and active-controlled, half-head study to evaluate the effects of platelet rich plasma on alopecia areata. Br J Dermatol. 2013;169(3):690-4.

23. Greco J, Brandt R. The effects of autologous platelet rich plasma and various growth factors on non-transplanted miniaturized hair. Hair Transplant Forum Int 2009;19:49-50.
24. Ninama K, Mahajan R, Bilimoria FE, Vaghani A. A clinical study on alopecia areata. Int J Res Dermatol. 2018;4:66-71.
25. Agrawal P, Jerajani HR, Jindal S. Intralesional platelet rich plasma therapy vs intralesional triamcinolone acetonide for the treatment of alopecia areata. MGM J Med Sci. 2018;5(2):68-75.
26. Tosti A, Piraccini BM, Pazzaglia M, Vincenzi C. Clobetasol propionate 0.05% under occlusion in the treatment of alopecia totalis/universalis. J Am Acad Dermatol. 2003;49:96-8.

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