JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

EFFECT OF PLATELET-RICH PLASMA (PRP) ON HAIRFALL (*KHALITYA*) ALONG WITH *AYURVEDIC* MEDICINES- A CASE STUDY

Dr. Niranjan Sharma[1], Dr.Yogesh Wane[2]

1. PG Scholar, department of Rachana Sharir, Govt.(Auto) Dhanwantari Ayurved college Ujjain M.P. 456001
2. Associate professor & HOD of department of Rachana Sharir, Govt.(Auto) Dhanwantari Ayurved college Ujjain M.P. 456001

ABSTRACT

In *Ayurveda Khalitya* is a basic term used for hair fall. *Acharya Charaka* confidential it under *Shiroroga*. *Khalitya* is mainly a *Pitta* dominant *Tridoshaj Vyadhi* i.e. *Vata, Pitta, Kapha* with *Rakta dosha*. According to modern science Alopecia or baldness is termed as *Khalitya*. It is a fractional or complete loss of hair mainly from the scalp. *Khalitya* is usually seen in the age of 20-45 years. In India up to 40% of men and 25% of women are suffering from hair loss, as based on a survey done in a community. Due to the scarcity of effective hair loss treatments, platelet-rich plasma (PRP) has emerged as a viable option. PRP is an autologous platelet concentration in plasma that contains several growth elements that aid in hair regeneration. Platelet alpha granules contain growth factors that operate on stem cells in the bulge region of hair follicles, stimulating the creation of new follicles as well as neovascularization. PRP has emerged as a potential therapeutic option for hair loss, including androgenic alopecia. Despite the fact that numerous studies have been published, there is no defined standard technique for PRP preparation and delivery, as well as a mechanism for evaluating results. The purpose of this literature review was to assess the efficacy of PRP for hair loss and to examine the various treatment protocols that have been presented.

KEYWORDS

Platelet-rich plasma, *Khalitya*, Androgenic alopecia, Hair follicle, Hair growth,

INTRODUCTION-

In *Ayurveda* hair fall or loss of hair termed as *Khalitya*.[1] *Acharya Sushruta* classified it under the head of *Kshudraroga*[2] and *Acharya Vagbhatta* describe the *Khalitya* under the *Shiroroga*.[3] According to modern

science; AGA is a non-scarring widespread alopecia that is defined by the increasing shrinkage of hair follicles and the transition of terminal hair into vellus hair.[4] Hair loss can cause significant psychological and emotional anguish, as well as a diminished quality of life. As a result, creating a safe and effective treatment technique in a dermatological practice environment can substantially benefit patients. Minoxidil, finasteride, nutritional supplements, low-level light therapy, and hair transplantation surgery are among contemporary therapeutic possibilities. They have disadvantages, such as limited clinical improvement in certain patients. Due to its autologous nature, minimal invasiveness, lack of major side effects and lower cost than hair restoration surgery, platelet-rich plasma (PRP) has become a popular treatment option for hair loss. Platelet in concentrated plasma (PRP) is an autologous platelet preparation.

AIMS AND OBJECTIVES-

1) To understand the preparation of platelet-rich plasma.
2) To shows the overall effect of PRP (platelet-rich plasma) in *Khalitya* with *Ayurvedic* medicines.
3) To discuss regarding PRP and *Ayurvedic* medicines in hair fall.

MATERIAL AND METHOD-

This study was carried out in the OPD of Charma Roga Nivaran unit in govt. Dhanwantari Ayurved College, Ujjain (M.P.)

CASE REPORT-

A 25 year old male patient, having OPD no. 24996, from a village near to Ujjain comes at Charma Roga Nivaran unit in govt. Dhanwantari Ayurved College, Ujjain (M.P.)

The patient was suffering from frontal hair loss and having complaints about dry hairs, mild itching over scalp, Constipation and *Daha* since 1 year.

NO H/O –Thyroid, DM, Taenia capatis, scalp psoriasis.

HISTORY OF PRESENT ILLNESS-

A year before, the patient was perfectly fine. Gradually, he acquired certain hair fall, graying of hair, feeling of internal *Daha*, as well as complaints of constipation. The patient had already been taken medications by a number of physicians, but there was little substantial relief. Then he comes to our Charma Roga Nivaran units in govt. Dhanwantari Ayurved College, Ujjain (M.P.)

PERSONAL HISTORY-

Dietary habits showed that there was a lot of *Amla, Lavana Dravya*, mixed dietary habits, a lot of curd, fatty and spicy rice, *Viruddha Ahara Vihara*, and unusual bowel habits, disturbed sleep, and patient was experiencing a lot of stress for few months.

PSYCHOLOGICAL HISTORY-

Khalitya (hair fall) patient having the feeling of isolated, ignored from society and become stressed because hair plays an important role and works as an ornamental to looking good in society. In addition, he complained of constipation and insomnia.

ASHTAVIDHA PARIKSHA-

SR. NO	*ASHTAVIDHA PARIKSHA*	VALUE
1	*NADI*	74/min
2	*MALA*	*Malabaddhata*
3	*MUTRA*	Normal
4	*JIWHA*	*Saam*
5	*SHABDA*	Normal
6	*SPARSH*	*Khara, Anushna*
7	*DRUK*	Normal
8	*AKRITI*	*Madhyam*

LOCAL EXAMINATION–

1. Itching
2. Burning
3. Greasiness
4. Density

INVESTIGATIONS-

1. Hb%- 10.3 g/dl
2. Serum ferritin- 18.4 ng/ml
3. Serum protein- 5.8 g/dl
4. PRP (for procedure)
5. KOH mount- To exclude any scalp fungal infection
6. Trichoscopic examination

Preparation of platelet-rich plasma

There is still no standardized method of preparation and application of PRP. PRP is produced through cell separation by centrifugation and so injected into androgen dependent areas of the scalp. Multiple methods of preparation of PRP are reported within the literature including commercial kits and manual methods employing a laboratory centrifuge. Some devices include an adjunct to cut back leukocyte count and increase platelet purity. Most preparations use either closed or semi closed systems, which differ in their

ability to concentrate platelets. This lead to suspensions that contain different concentrations of platelets and leukocytes. All PRP preparation protocols follow a generic method. Blood is collected with an anticoagulant like citrate to forestall spontaneous blood coagulation and consequent platelet activation. Subsequently, blood is centrifuged to separate red blood cells, followed by centrifugation to concentrate platelets. Many protocols include the addition of exogenous platelet activators like thrombin or salt before administration, which ends up in a direct dose dependent release of growth factors. However, there's no consensus about whether this improves efficacy. Non activated or resting PRP could also be injected and spontaneous platelet activation occurs because of exposure to dermal collagen and thrombin.6 Platelet protein synthesis continues for 7 days. The most favorable number of treatments and time spaced between them has not been recognized. The wide variation in reported protocols to get PRP may cause samples with different compositions of platelets, leukocytes, erythrocytes, and protein concentrations that will induce different biological responses. Establishing the importance of those elements is crucial to spot the foremost effective preparation for AGA. Platelet concentration factor is that the most often described parameter and thought to primarily influence PRP efficacy. Numerous studies have discussed the significance of the platelet concentration consider the support of tissue regeneration, which indicates that an amount two to 6 times more than basal platelet counts, is required for most favorable outcomes. Many study showed that the optimal platelet concentration for the induction of angiogenesis in human endothelial cells was 1.5 million platelets/ ml. A mean of 1.48 million platelets/ ml was shown to stimulate follicular and perifollicular angiogenesis, which is very important for active hair growth.

Figure No.1&2 shows centrifuge machine and prepared platelet rich plasma

Mode of action of Platelet-rich plasma -

Activated platelets are understood to release numerous growth factors and cytokines from their alpha granules as a part of the wound healing process. When platelets absorbed into the scalp, it become activated and discharge multiple growth factors, which endorse hair growth. These growth factors play a task in fibroblast activation, collagen synthesis, stimulation of the extracellular matrix, and over expression of endogenous growth factors. Growth factors including platelet-derived protein, transforming protein beta (TGF-β), vascular endothelial protein, epidermal protein, and insulin like growth factor-1 are released by

activated platelets in PRP and believed to market cell proliferation, differentiation, angiogenesis, and chemo taxis that's necessary for brand new hair regrowth. IGF-1 has been revealed to persuade and delay the hair anagen phase. Platelets also contain dense granules that contain bioactive factors to extend membrane permeability and modulate inflammation. Membrane permeability is increased by dense granules which are containing serotonin, histamine, dopamine, calcium, and adenosine. Activated PRP has been reported to induce the proliferation of dermal papilla (DP) cells by activating extracellular signal-related kinase and protein kinase B. Signaling and PDGF in PRP up regulate the ERK pathway, resulting in the increased transcription of genes involved in cellular proliferation and differentiation. Additionally, the increased expression of Bcell lymphoma-2 has been observed in in-vitro human DP cells cultured with PRP. Thus, activated PRP is believed to affect hair cycling by prolonging the length of the anagen phase and preventing apoptosis and therefore the catagen phase. The beginning of the anagen phase is considered to be dependent on angiogenesis and enhanced vascularization of the follicle. PRP contains expansion factors that act on stem cells in the bulge region of follicles, causing neovascularization and follicle genesis. Increased catenin expression was also detected, which is thought to promote DP cell proliferation, survival, and angiogenesis. PRP promotes hair growth by increasing follicle vascularization, preventing apoptosis, and so extending the anagen phase and causing a quicker shift from telogen to anagen introduce DP cells.

Proposed protocol for treatment-

We propose PRP as a co adjuvant therapy for *Khalitya* based on our clinical expertise, and we advise patients to continue topical and oral treatments (e.g., *Asthiposhak vati,* and original *Bramhi* oil). Based on our study of the literature, we recommend preparing PRP using a single spin centrifugation technique to get pure PRP with a platelet enrichment of 3 to 6 times that of whole blood. Because it is less uncomfortable, we propose administering PRP as numerous needles pricking on the bald region. PRP can be diffused using this approach. Treatment intervals should be bimonthly for the first four months, then monthly for up to 6 months. PRP has had good results in terms of hair regeneration, higher hair density, and better quality of life in patients who have experienced hair loss.

TREATMENT-

(A) Oral medication

(B) Table No-01

S.N.	Formulation		Dose	Duration	*Anupana*
1	*Asthiposhak Vati*		2*BD After meal	30 days	Water
2	*Arogyavardhini Vati*		2*BD After meal	22 days	Water
3	*Shatavari Churna*	2gm	1*BD after meal	20 days	With honey
	Shankh bhasma + Mukta bhasma	1gm			
	Shirshooladi vajra Rasa	150mg			
	Prawal pishti	250 mg			
	Kamdudha Rasa	150 mg			
4	*Bhringarajasavam*		10ml*BD after meal	20 days	With equal water
5	*Swadista Virechana Churna*		4gm*hs	10 days	Withluke warm water

(C) Local application

Table No- 2

S.N.	Formulation	Dose	Duration	Remark
1	*Triphala Churna* 1tsf + curd 2 tsf	Mix it in iron container at night and apply at morning for at least 1 hour	10 days (alternate day)	Wash after 1 hour
2	Olosyn hair oil	Quantity as per need	30 days	Apply over area

OBSERVATION AND RESULTS-

The patient was told to take the continuous seating of PRP up to 6 months along with *Ayurvedic* medication for the same duration, before eventually discontinuing modern medicines. He also told to avoid *Lavana, Amla rasa,* and *Tikshna Dravya*, curd, spicy food, *Pittaja Ahara Vihara, Adhyashan, Divasvapna, Ratrijagaran* for a long period.

Figure No.2 & 3 shows pricking on frontal region of baldness

DISCUSSION-

About PRP-

PRP effectiveness as a therapy method for androgenic alopecia and normal hair loss has been demonstrated in several trials. Each patient in this research had two PRP treatments, one month apart, and was assessed using a trichoscope. Mean anagen hairs, telogen hairs, hair density, and terminal hair density in PRP-treated regions improved significantly after 6 months compared to baseline. Increased hair density, on the other hand, was the sole significant factor. Every month, two first treatments will be applied by a research researcher, and this will last for four months. After that, participants exhibited an improvement in mean hair count and total hair density after receiving one PRP cycle per month for the next two months. PRP may enhance keratinocyte proliferation and perifollicular angiogenesis, according to these findings. A pull test revealed substantial effects, including an increase in hair count, hair thickness, and the degree of alopecia.

About *Ayurvedic* medicines-

Asthiposhak Vati- It is a good source of natural calcium, and indicated in calcium deficiency, hair fall, graying of hair. It balances *Vata Dosha*. It nourishes Asthi Dhatu so that its byproduct or Mala (hairs) will nourish automatically.

Arogyavardhini Vati- It is having a property of Dhatu balancing so it works on *Dhatvagni* level so that every Dhatu and their mala form completely. It is *Srotovishodhana* (cleansing body channels), and *Pitta Doshahara* (alleviates *Pitta*)[(7)] *Rasaratnasamucchaya* mentions *Arogyavardhini vati* for the care of skin disease. [(8)]

Shatavari Churna- It has the property to nourish Rasa Dhatu. Hair fall and premature graying is also occur in Rasa *pradoshaj vikar*. If the first *Dhatu* is being correct then progressive *Dhatu* will be definitely correct and nourished.

Swadishta Virechana Churna- It is employed in *virechana karma*. According to *Charaka*, a *Shwitra* patient should go through *Shodhan* before receiving shaman *chikitsa*. *Swadista virechana churna* has the following properties, including *virechana karma*, which is used as a mild purgative in skin diseases. It contains *Sanaya* for *virechana* and *Suddha Gandhak*, which helps to relieve scratching and burning sensations in skin diseases.

CONCLUSION -

Based on the findings of the evaluated clinical studies, the use of PRP to treat hair loss appears to be promising. There appear to be few safety concerns, side effects, and downtime. Although PRP appears to be beneficial, the preparation, dosage, number, and interval of treatment sessions, as well as pricking technique, would need to be reported. We would also need to report the frequency of sessions, PRP concentration, and long-term follow-up to see how long-term results are sustained. Randomized placebo-controlled trials with bigger sample numbers are needed to further define the effects of PRP on hair regeneration in hair loss or androgenic alopecia. Following that, Ayurvedic treatment has its own significance, such as *Asthiposhak vati*, which treats calcium insufficiency, and *Arogyavardhini vati*, which corrects Dhatu imbalance on the *Dhatvagni* level. Hair is symbolic of a good personality's perfection. Any handicap might cause cosmetic deformity. We sought to shed light on the effect of PRP with *Ayurvedic* medications of *Kesh* in this case study, and we came to the conclusion that the combination of PRP and *Ayurvedic* medicine gives the safest and most successful therapy.

ACKNOWLEDGEMENT –

I would like to thank Dr. Yogesh Wane sir, Dr. Priya for their valuable guidance, support, suggestions and encouragement.

REFERENCE-

1. V.M Jadhav, R. M Thorat, V.J Kadam and S.B Gholve kesharaja: hair vitalizing herbs International journal of pharmtech research coden (usa): ijprif issn : 0974-4304 vol.1, no.3, pp 454-467, july-sept 2009

2. Sushruta Samhita of Maharsi Sushruta edited with "Ayurveda Tatva Sandipika" Hindi Commentary by Kaviraj Ambika Dutta Shastri, Chaukhambha Sanskrit Sansthan, Varanasi, Ed. Reprint, 2014, Su. Ni. 13/3/272

3. Ashtanga Hridaya of Vagbhata edited with the Vidyotini Hindi Commentary by Kaviraj Atri Dev Gupta, Chaukhambha Prakashan Varanasi, Ed. Reprint, 2016, A.H./Ut/19/857

4. Dinh QQ, Sinclair R. Female pattern hair loss: current treatment concepts. Clin Interv Aging 2007, 189–99.

5. Dhurat R, Sukesh M. Principles and methods of preparation of platelet-rich plasma a review and author's perspective. J Cutan Aesthet Surg 2014;189–97.

6. Cavallo C, Roffi A, Grigolo B, Mariani E, Pratelli L, Merli G, et al. Platelet-rich plasma: The choice of activation method affects the release of bioactive molecules. Biomed Res Int 2016.

7. Harishankar S. Rasratna Samucchay of Vagbhata, vol. II, Ch. -20, Ver. 91–97, Revised ed., Delhi: Bharatiya Kala Prakashan; 2014. P.n. -502–503

8. Ambhikdutta Shastri, Rasaratnasamucchaya, 9th edition, Chaukhambha Sanskrit Publisher, Reprint-1994, chapter- 20, P.N. 400