

# Efficacy of platelet rich plasma combined with narrow band UVB in the treatment of vitiligo

Hurria Aslam<sup>1</sup>, Saadiya Siddiqui<sup>1</sup>, Rabia Hayat<sup>1</sup>, Atif Shahzad<sup>1</sup>, Ramla Kazmi<sup>2</sup>, Tariq Rashid<sup>1</sup>

<sup>1</sup>Department of Dermatology, Postgraduate Medical Institute/ AMC/ Lahore General Hospital, Lahore.

<sup>2</sup>Department of Dermatology, Sahara Medical College, Narowal.

## Abstract

**Objective** To determine the efficacy of PRP + NBUVB in combination in the treatment of vitiligo.

**Methods** This longitudinal interventional study was carried out at the Dermatology department, FJMU, Lahore, during January 30 - July 30, 2018. After obtaining informed consent and approval from the Institutional Ethical Committee, 73 patients with stable, non-segmental vitiligo were enrolled. NBUVB (311-315 nm) treatment was administered twice a week for a maximum of 4 months or until complete recovery. In addition to UVB therapy, all participants received PRP injections. The PRP was prepared following standard procedures and injected intradermally into the marked lesions using an insulin syringe. 0.1 cc of PRP was injected per point with 2 cm spacing between each injection. The injections were given every two weeks for a total of 4 months. Treatment efficacy was evaluated according to the operational definition, and all data were collected by the researcher.

**Results** Total number of patients was 73. There were 27 (36.99%) male and 46 (63.01%) female cases. The mean age of patients was 35.42±14.03 years with minimum and maximum age as 15 and 60 years. The mean VASI at baseline and at 4th month was 39.29±14.82 and 72.41±15.13 respectively. According to operational definition, 62 (84.93%) cases had efficacy of treatment while 11 (15.07%) cases did not meet efficacy criteria.

**Conclusion** Combination of PRP+NBUVB is efficacious in treating vitiligo and shortens the duration of NBUVB therapy and increases the patient compliance.

## Key words

Chronic stable vitiligo; Efficacy; NBUVB; Platelet-rich plasma; Vitiligo Area Severity Index (VASI).

## Introduction

Vitiligo is an autoimmune condition marked by well-defined depigmented spots and patches caused by the gradual loss of functional melanocytes.<sup>1</sup> Vitiligo patients possess three alleles that under effect of environmental

factors predispose them melanocytes to degeneration resulting in skin hypopigmentation.<sup>1,2</sup> Segmental vitiligo is considered a separate entity from all other varieties of non-segmental vitiligo. Worldwide population incidence of vitiligo is 0.5 to 2%.<sup>3</sup>

Vitiligo is a benign but emotionally frustrating condition since its sufferers experience lower self-esteem.<sup>4</sup> Patients are often advised to seek cosmetic camouflage along with sunscreens.<sup>5</sup> Various treatment options include potent topical corticosteroids, calcineurin inhibitors, systemic PUVA and Narrow band UVB therapy,

**Manuscript:** Received on: December 26, 2023

Revised on November 18, 2024

Accepted on: December 10, 2024

## Address for correspondence

Dr. Saadiya Siddiqui, Assistant Professor,  
Department of Dermatology, Postgraduate Medical  
Institute/ AMC/ Lahore General Hospital, Lahore.  
Email: saadiyas7@gmail.com

transplant procedures, JAK inhibitors and cytokine directed therapies.<sup>6</sup>

NBUVB is a relatively safer and efficacious treatment which is considered better to PUVA due to its better safety profile and repigmentation. It employs a range of 311-313nm which is the most favourable of UV spectrum thus avoiding exposure to undesirable UV radiation resulting in reduced chances of harmful effects. It also avoids adverse side effects of psoralens and the resultant repigmentation is a natural skin colour match.<sup>6,7</sup> PRP plays great role in melanocytes regeneration and reducing inflammation therefore improving vitiligo. This is attributed to the release of multiple growth factors from alpha granules of concentrated platelets such as platelet-derived growth factor, transforming growth factor, vascular-endothelial growth factor and insulin-like growth factor. These growth factors minimize melanocyte destruction through a healthy interaction of keratinocytes and fibroblasts.<sup>8</sup>

A split face study on 60 patients with stable vitiligo had reported that combined NBUVB and PRP( right side body) was more efficacious i.e. 33 (55%) patients showed excellent response, 12 (20%) with good response, 9 (15%) had moderate response, and 6 (10%) patients had mild response. So good to excellent response was seen in 75%, as compared to left side of body which was treated with NBUVB alone.<sup>9</sup>

Therefore we wanted to find the effectiveness of combined PRP+NBUVB therapy in the treatment of vitiligo in our local population. Scant local data is available and studies on other populations are also lacking.

## Methods

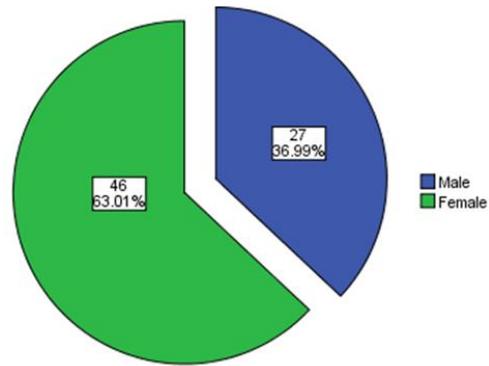
This longitudinal interventional study was conducted at Dermatology Department, FJMU/SGRH, Lahore from (2018) Jan 30<sup>th</sup> -

July 30<sup>th</sup>. A total sample of 73 cases was estimated using the efficacy of treatment as 75%<sup>8</sup> (good to excellent) taking 10% margin of error and 95% confidence level. Patients of both genders from 15-60 years age were selected through non-probability consecutive sampling suffering from vitiligo which was assessed through VASI on all patients having symmetrical non-segmental stable vitiligo, having  $\geq 75\%$  depigmentation within lesions. Those were included in this study who had not taken any treatment for last 3 month. Patients who showed good response to other therapies, having photo aggravated dermatoses, pregnant and lactating females, blood dyscrasia and those who are unable to stand in UV chamber were excluded. All enrolled patients were given **NBUVB**: NBUVB chambers used in this study were closed chambers with voltage of 220mV with spectrum 311-315nm, on affected region by covering the rest of the body, biweekly for either 4 months/ complete repigmentation, whichever comes first. The initial dose 20 mJ/cm<sup>2</sup> which was increased by 20 percent on subsequent exposure till minimum erythema dose was achieved. Along with UVB treatment; PRP was given to all cases. PRP was prepared by collecting 10-15 ml of blood sample of the patient and 0.5 cc anticoagulant added to the serum vial in which blood sample had been taken. The vials were then centrifuged to 1500 revolutions/min for 10 minutes and 400 revolutions for 5 minutes. PRP was given to the patient intradermally in the marked lesions after every two weeks. Prepared PRP was injected intradermally into the marked lesions using an insulin syringe, with 0.1 cc injected per point and 2 cm spacing between each injection site. PRP was done every two weeks for total duration of 4 months. Treatment response was assessed by calculating the VASI score both at baseline and after 4 months of treatment. **Efficacy**: The efficacy was labeled if there was good to excellent response ( $\geq 50$  point

improvement in VASI score) from baseline to 4<sup>th</sup> month of treatment. All data was collected by researchers. The data analyzed using SPSS version 20. For quantitative data like age, VASI score at baseline and at 4<sup>th</sup> month, the mean and standard deviation was calculated. The categorical data like gender and efficacy of treatment was presented in the form of frequency (%). Data was stratified for age, gender, duration of vitiligo, body part involved and baseline VASI score and VASI score after four month of treatment to address effect modifiers. Chi-square test was utilized considering p-value  $\leq 0.05$  as significant to determine efficacy.

**Results**

The total patients included in this study were 73. There were 27 (36.99%) male and 46(63.01%) female cases (**Figure 1**). The mean age was  $35.42 \pm 14.03$  years ranging 15 to 60 years. (**Table 1**). 37 patients were those who had disease duration for less than 5 years and 36 were those who had disease greater than 5 years. (**Table 2**). The mean VASI at baseline  $39.29 \pm 14.82$  and at 4<sup>th</sup> month was  $72.41 \pm 15.13$  (**Table 1**). When the data was analyzed by age, among the cases that showed treatment efficacy, 39 (62.9%) were in the 15-40 age group, and 23 (37.1%) were in the 41-60 age group. The frequency of efficacy was similar between males (23 cases) and females (39 cases), with no statistically insignificant as greater probability than 0.05). Among those who did not show



**Figure 1** Gender distribution.

**Table 1** Descriptive Statistics of age (years).

	Age (years)	VASI (baseline)	VASI (4 months)
Mean	35.42	39.29	72.41
Standard Deviation	14.03	14.82	15.13
Range	45.00	55.00	51.00
Minimum	15.00	12.00	39.00
Maximum	60.00	67.00	90.00

treatment efficacy, 7 (63.6%) were in the 15-40 age group, and 4 (36.4%) were in the 41-60 age group. The frequency of efficacy was also similar between the two age groups hence statistically insignificant (p-value > 0.05). (**Table 2**). The effectiveness frequency was also statistically identical in cases i.e. 30 versus 32 who had duration of disease as < 5 years and  $\geq 5$  years (**Table 2**). The frequency of efficacy was statistically same with respect to body part involvement and baseline VASI score, p-value > 0.05 (**Table 3**). According to operational definition, 62 (84.93%) cases had efficacy of treatment while 11 (15.07%) cases did not meet efficacy criteria. (**Figure 2; Table 4**). The VASI at 4 months was  $72.41 \pm 15.13$  (**Table 1**).

**Table 2** Comparison of efficacy of treatment with respect to age, gender and duration of disease.

		Efficacy		Total	Chi square	P value
		Yes	No			
Age groups	15-40	39 (62.9%)	7 (63.6%)	46 (63.0%)	0.002	0.963
	41-60	23 (37.1%)	4 (36.4%)	27 (37.0%)		
Total	62 (100%)	11 (100%)	73 (100%)			
Gender	Male	23 (37.1%)	4 (36.4%)	27 (37.0%)	0.002	0.963
	Female	39 (62.9%)	7 (63.6%)	46 (63.0%)		
Total	62 (100%)	11 (100%)	73 (100%)			
Duration	< 5 years	30 (48.4%)	7 (63.6%)	37 (50.7%)	0.869	0.351
	5 years or more	32 (51.6%)	4 (36.4%)	36 (49.3%)		
Total	62 (100%)	11 (100%)	73 (100%)			

**Table 3** Comparison of efficacy of treatment with respect to Body Parts Involvement.

Body Parts Involvement	Efficacy		Total
	Yes	No	
Extremities	27(43.5%)	4(36.4%)	31(42.5%)
Facial	8(12.9%)	3(27.3%)	11(15.1%)
Trunk	9(14.5%)	2(18.2%)	11(15.1%)
Acral	18(29.0%)	2(18.2%)	20(27.4%)
Total	62(100%)	11(100%)	73(100%)

Chi-square = 1.879; P-value = 0.598

**Table 4** Comparison of efficacy of treatment with respect to VASI score (baseline).

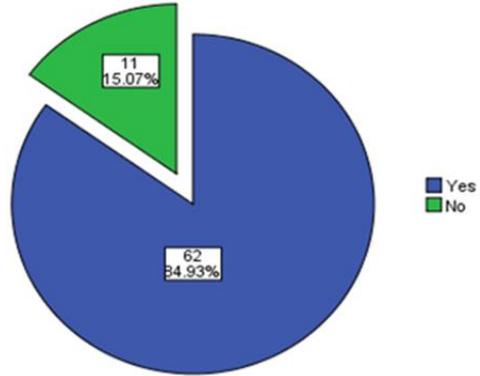
VASI (baseline)	Efficacy		Total
	Yes	No	
< 50	53(85.5%)	10(90.9%)	63(86.3%)
≥50	9(14.5%)	1(9.1%)	10(13.7%)
Total	62(100%)	11(100%)	73(100%)

Chi-square = 0.233; P-value = 0.630

**Discussion**

Vitiligo is an acquired disorder of pigmentation. NB-UVB phototherapy has been recognized as a crucial treatment for vitiligo since its introduction in 1997.<sup>10</sup> It has demonstrated higher efficacy, better tolerance, and greater effectiveness compared to other treatment options.<sup>11</sup> Platelet-rich plasma (PRP) is a preparation made from a patient's own blood, containing concentrated platelets. These platelets through various cytokines are crucial in regulation of several biological mechanisms including cellular proliferation and promotion of extracellular matrix formation by interacting with cellular receptors.<sup>12</sup>

In the current study, the total number of patients were 73. As regards the gender distribution, there were 46(63.01%) females and 27(36.99%) males. More female cases were there as female are more concerned about cosmetic disfigurement. The prevalence of vitiligo is same in both genders although in some series based on outpatient attendance a female preponderance was noted.<sup>3</sup> A study conducted showing effect of phototherapy on vitiligo, had more female patients than males, and they are also more



**Figure 2** Distribution of efficacy.

regular and compliant to the treatment.<sup>6</sup> The mean age of patients was 35.42±14.03 with age range between 15-60 years. Vitiligo can occur at any age but majority of cases are reported between 20-30 years, because at this age group people are more concerned about the appearance of their skin. The mean age in current study was same as given in literature. A total 37 patients had disease duration less than 5 years while 36 patients had disease duration greater than 5 years. The baseline VASI was 39.29±14.82; minimum value was 12 and maximum was 67. The efficacy of the treatment was the same between male and females. The effectiveness frequency was statistically similar across different body parts and baseline VASI scores, with a p-value greater than 0.05.

The present research showed the mean VASI scores of 39.29±14.82 and 72.41±15.13 respectively at baseline and after 4<sup>th</sup> month. According to operational definition, 62 (84.93%) cases showed efficacy 11 (15.07%) cases did not show any efficacy. Good to excellent response was seen in 75%. A recent prospective observational study on chronic stable vitiligo found that combining PRP and NB UVB is more efficacious compared to NB UVB as solo therapy. Pigmentation was observed in 60% of patients treated with the combined therapy, compared to just 20% in those receiving NB UVB with intralesional normal saline.<sup>13</sup>

However, there are limitations since intradermal injections are somewhat painful for the patient and for phototherapy patient requires multiple hospital visits.

## Conclusion

The combination of Intradermal PRP and NBUVB is considered is efficacious in treating vitiligo.

**Declaration of patient consent** The authors certify that they have obtained all appropriate patient consent.

**Financial support and sponsorship** None.

**Conflict of interest** Authors declared no conflict of interest.

## Authors' contribution

**HA:** Substantial contribution to study design, acquisition of data, manuscript writing, has given final approval of the version to be published.

**SS:** Substantial contribution to study design, manuscript writing, has given final approval of the version to be published.

**RH:** Substantial contribution to analysis and interpretation of data, critical review of the manuscript, has given final approval of the version to be published.

**AS,RK,TR:** Substantial contribution to conception, study design, critical review of the manuscript, has given final approval of the version to be published.

## References

1. AL-smadi K, Imran M, Leite-Silva VR, Mohammed Y. Vitiligo: A Review of Aetiology, Pathogenesis, Treatment, and Psychosocial Impact. *Cosmetics*. 2023; **10(3)**:84. <https://doi.org/10.3390/cosmetics10030084>
2. Joge RR, Kathane PU, Joshi SH. Vitiligo: A Narrative Review. *Cureus*. 2022; **14(9)**:e29307. doi: 10.7759/cureus.29307. PMID: 36304341; PMCID: PMC9586189.
3. Bergqvist C, Ezzedine K. Vitiligo: A Review. *Dermatology*. 2020; **236(6)**:571-92. doi: 10.1159/000506103. Epub 2020 Mar 10. PMID: 32155629.
4. Tabassum S, Rahman A, Ghafoor R, Khan Q, Ahmed N, Amber T, et al. Quality of Life Index in Patients with Vitiligo. *J Coll Physicians Surg Pak* 2023; **33(05)**:521-6.
5. Paula L. Vitiligo: Diagnosis and treatment [Internet]. Diseases & conditions. [cited 2023]. Available from: <https://www.aad.org/public/diseases>
6. Feng Y and Lu Y. Advances in vitiligo: Update on therapeutic targets. *Front Immunol*. 2022; **13**:986918. doi: 10.3389/fimmu.2022.986918
7. Wang E, Rodrigues M. An update and review of narrowband ultraviolet B phototherapy for vitiligo. *Dermatological Reviews*. 2022; **3**:326-35.
8. Jessica N. Pixley, Madison K. Cook, Rohan Singh, Jorge Larrondo, Amy J. McMichael. A comprehensive review of platelet-rich plasma for the treatment of dermatologic disorders. *J Dermatol Treat*. 2023; **34(1)**:2142035. DOI: 10.1080/09546634.2022.2142035
9. Ibrahim ZA, El-Ashmawy AA, El-Tatawy RA, Sallam FA. The effect of platelet-rich plasma on the outcome of short-term narrowband-ultraviolet B phototherapy in the treatment of vitiligo: a pilot study. *J Cosmet Dermatol*. 2016; **15(2)**:108-16.
10. Westerhof W, Nieuweboer-Krobotova L. Treatment of vitiligo with UV-B radiation vs topical psoralen plus UV-A. *Arch Dermatol*. 1997; **133(12)**:1525-8.
11. Al Rubaie S. An open randomized study of treatment of 39 patients of generalized vitiligo with narrow-band UVB versus topical calcipotriol+ Puva versus Puva therapy for 6–12 months. *J Eur Acad Derm Venereol*. 2002; **16**:270.
12. Wrotniak M, Bielecki T, Gaździk T. Current opinion about using the platelet-rich gel in orthopaedics and trauma surgery. *Orthop Traumatol Rehabil*. 2007; **9(3)**:227-38.
13. Amit Kumar Pandey, Mohan A, Prannav Satyaraj. A comparative study of narrowband-ultraviolet B plus intralesional normal saline versus narrowband-ultraviolet B with platelet rich plasma in treatment of vitiligo. *Int J Res Dermatol*. 2023; **9(4)**:175-81.