Original Article

Efficacy of Platelet Rich Plasma in Stretch Marks

Rich Plasma in Stretch Marks

Sabah Ibad, Seemab Khan, Shaista Umbreen and Sumeera Zulfiqar

ABSTRACT

Objective: Striae distansae are stretch marks with associated dermis atrophy. The objective of the present study was to check the efficacy of PRP as one of the treatment modality currently being used for improving SD lesions.

Study Design: A cross sectional study

Place and Duration of Study: This study was conducted at the Dermatology Department of Combined Military Hospital Multan from 28th July 2020 to 28th Dec 2020.

Materials and Methods: A total of 20 patients: 03 males and 17 females with SD were enrolled in the study. All patients were treated with PRP injections administered intra-dermally. Clinical improvement was graded based on the examination by dermatologists and by comparing the photographs taken before and after the treatment. In addition a fellow up was done to report any side effects associated with the therapy. The overall evaluation of the therapy was done by including patient's satisfaction rating.

Results: Twenty patients were included: 03(15%) were males and 17(85%) were females. Most of the patients included in study had Type IV skin, 05(25%) had Type III and 03(15%) had Type V skin. Excellent improvement following treatment was achieved in 6(30%) of the patients treated with PRP. Marked improvement was seen in 10(50%) of the participants. There was mild improvement in 3(15%) while in 1(5%) no improvement was observed. According to patient's evaluation 5(25%) of the patients graded the treatment as Excellent. 12(60%) was satisfied and 3 (15%) were unsatisfied with the treatment results. Overall the results showed that the platelet rich plasma is effective enough in treating stretch marks.

Conclusion: PRP is a safe and effective treatment for stretch marks.

Key Words: Platelet rich plasma, Stretch marks, Striae distansae, dermal scarring.

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INTRODUCTION

Stretch marks or striae distansae (SD) are well acknowledged common skin condition. It is rarely associated with medical complications but causes distress to the effected individuals[1]. It affects both genders, but it is likely to be more prevalent in females[2]. The etiology of the SD is still not clearly understood[3]. SD are linear dermal scars accompanied by epidermal atrophy[4]. There are a number of different hypothesis in literature that outline the underlying mechanisms that result in stretch marks.

These mechanisms include both physiological and pathological processes. For example the infections that are associated with release of striatoxin can result in tissue damage[5]. It can also occur in patients with chronic liver disease [6].

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Moreover increase in the levels of body steroid hormones like in Cushing's syndrome can be one of the underlying causes[3]. The local or systemic steroid therapy also has a catabolic effect on fibroblasts[7].

Regarding physiological processes mechanical effect of stretching that happens in adolescent growth, pregnancy, obesity has been proposed to rupture connective tissue framework[4]. Marfan syndrome is another condition associated with striae formation in pregnancy; it comes in context of genetic factors[8]. Decreased expression of collagen and fibronectin genes has also been associated with striae. Other causes include immunosuppression states like in HIV, Tuberculosis, Typhoid and pregnancy-induced hypertension medications[9].

Based on histology the stria is a scar[3]. The development of stretch marks is linked to wound healing[10]. In the initial stages, inflammatory changes may be prominent, however the epidermis is thin and flattened later on [11]. There is also deep and superficial lymphocytic infiltration around the vanules. The Collagen bands in reticular dermis get stretched and are aligned parallel to the surface of the skin[12]. Following early stages, with gradual loss of collagen and elastin there is thinning of the epidermis[13]. The frequency of SD is that it affects two and a half times more women. Among affected individuals 90% are pregnant females[14]. The sites that are commonly affected

include the thighs, upper arms, buttocks, and breasts in girls while outer aspects of the thighs and the lumbosacral region in boys [15].

There are number of treatment modalities being used for treatment of SD, however the results have been disappointing[16]. Only minor improvements were seen following most treatment regimes. These regimes include chemical peels, ultrasound therapy, microdermabrasion and tropical retinoid therapy. Some therapies have been reported to give better results e.g. fractional photothermolysis, pulsed dye laser, radiofrequency and fractional photothermolysis [17].

Platelets are known for their high concentration of growth factors[18]. The use of platelets started as a facial and quickly turned into O-shots, breast lifts, and lip augmentations. Recently platelet rich plasma is being used in rejuvenation of stretch marks[18]. It is a great non-invasive treatment for SD. It helps in generating new connective tissue for example collagen & elastin[19].The injection of platelet rich plasma (PRP) release platelets that stimulate collagen and helps skin to heal and look firm and younger. Autologous platelet rich plasma is also being explored and utilized for treatment of SD.[20]

As there is stigma associated with SD and patients are considering getting PRP treatment. In this study we evaluated the efficacy of PRP in treatment of stretch marks.

MATERIALS AND METHODS

The cross sectional study design was carried out at the Dermatology department, CMH, Multan from 28 July 2020 to 28 Dec 2020. Patients of ages in the range of 18 to 45 which presented with bilateral symmetrical SD (as inclusion criteria) were enrolled in the study. The patients with diabetes mellitus, Liver cirrhosis, malignancy, systemic infections, anemia or low platelet count were excluded. The patients which were on treatment with corticosteroids, aspirin or anticoagulants were also excluded. Following inclusion and exclusion criteria 20 patients were selected for further study. Complete history of the patients was taken and SD was assessed dermatologically for the type of skin and the site of the lesion present. Additionally some laboratory investigations including blood complete picture, prothrombin time and partial thromboplastin time were also taken into consideration.

Patients were injected with PRP every month for 3 sessions. PRP was injected intra-dermally in the quantity equals to 0.1Ml per injection. Antibiotics were topically used for 3 days following each session. The SD of each patient was examined for comparative analysis before therapy, for successive session and after 2 months after the last session. Following examination digital photographs were taken of the lesion using 16.2 megapixels camera (Sony cyber shot DSC-TX10; Sony Electronics Inc. Tokyo Japan). The request for dermatologist opinion was made to two specialists. On the basis of their opinion the % improvement in each patient was recorded. The before and after photographs of the session was used for this purpose. The quartile grading scale was determined as 1- worsening of the SD, 2- No improvement, 3- Mild improvement and 4- Marked improvement and 5- Excellent improvement. The patients were requested to grade the treatment efficacy as Excellent, Satisfactory/un satisfactory at final visit.

Data Analysis: All data was analyzed using Statistical Package for the Social Sciences (SPSS). Data was expressed as mean ± Standard Deviation and range. The outcome of the treatment was graded according to the degree of improvement and the percentage efficacy was calculated.

RESULTS

Twenty patients with symmetrical and bilateral SD were included in the present study. The demographic and clinical data is presented in the Table 1. Among 20 patients 03(15%) were males and 17(85%) were females. Most of the patients included in study had Type IV skin, 05(25%) had Type III and 03(15%) had Type V skin. Alba type SD was more prevalent in the study group as compared to the rubra type. The lesion sites of the patients included arms, abdomen, knees & thighs. Based on the assessment made on the comparative analysis of the photographs taken along with the dermatologist opinion the results showed that excellent improvement was achieved in 6 (30%) of the patients treated with PRP.

Table No. I: Demographic and Clinical Data of the Patients

Clinical data	No.	%
Age	25 ± 5.5	
Sex Male Female	 3 17	 15 85
Type of Skin Type III Type IV Type V	 5 12 3	 25 60 15
Type of SD Alba Rubra	 13 07	 65 35
Duration of SD Per months	8-96 months. Mean ± SD (41.09 ± 31.4)	
Site of SD Arms Abdomen Knees Thighs	 08 03 02 07	 40 15 10 35

Table No.2: Classification of the groups based on the quartile grading results by dermatologists

Degree of Improvement	No. of Patients	% efficacy
Worse	0	-
No improvement	1	5
Mild improvement	3	15
Marked improvement	10	50
Excellent improvement	06	30

Table No.3: Classification of the groups based on the degree of clinical improvement based on patient's feedback

Improvement	No. of patients	% Efficacy
Excellent	5	25
Satisfactory	12	60
Un Satisfactory	3	15

Marked improvement was seen in 10 (50%) of the participants. There was mild improvement in 3 (15%) while in 1 (5%) no improvement was observed. According to patient's evaluation 5 (25%) of the patients graded the treatment as Excellent. 12 (60%) was satisfied and 3 (15%) were unsatisfied with the treatment results. Overall the results showed that the platelet rich plasma is effective enough in treating stretch marks.

Mild pain was the only complain recorded by the patients following treatment. None of the patient presented with bruises, hyperpigmentation or any kind of skin allergies within 3 months following treatment.

DISCUSSION

Striae distansae is a very common problem with which patients present in dermatology department. Because of the associated stigma it causes negative impact on the psychology of the patient. PRP are obtained by double spin method (centrifugation) of the whole blood[21]. The exact role of PRP in treatment of SD is still unclear. There is evidence that the growth factors are released from the granular component of PRP. These factors have ability to improve extracellular matrix by initiating cellular growth and causing proliferation[22]. Particularly TGF- β1 has shown to improve both synthesis and deposition of collagen on *in vitro* analysis [4]. In another study it was identified that PRP has a dose dependent response that causes proliferation of human mesenchymal stem cell & fibroblast and also enhances production of type I collagen[23]. Moreover PRP generates hyaluronic acid that hydrates the matrix and consequently not only creates volume but also lubricates tissues[11]. Furthermore hyaluronic acid accelerates cellular proliferation in the extracellular matrix along with enhancing diameter of collagen fibers. Hence PRP with generation of hyaluronic acid also improves skin elasticity [12].

According to some recent studies expression of matrix metalloproteinases (MMPs) is also increased by activated PRP[3]. The MMPs are involved in dermal remodeling as they are capable of removing damaged collaged fragments from matrix. In this way MMPs pave way for deposition of new collagen[24]. The dermal remodeling is a process required for improvement of SD[25]. Hence in the current study the obtained % efficacy of PRP in treating SD is in accordance with the literature. Among 20 participants there was marked improvement in SD lesions of 16 patients. Besides this SD lesions in 3 patients also showed mild improvement. There was only one patient with no considerable improvement in SD lesions following PRP treatment. The results obtained in the present study correlate with previous studies on effectiveness of PRP on stretch marks. In microdermabrasion. The results of the study revealed significant difference in both treatment modalities with PRP showing better results[26]. Similarly in another comparative study of the treatment of SD, the efficacy of PRP was determined vs. Tretinoin. The same study shows results in accordance to the current study with PRP showing significantly enhanced % efficacy[27].

It has been proven that PRP is involved in the healing process. It stimulates the requirement, proliferation and differentiation of the cells. Based on the results of the current study and previous literature we can say that the enthusiasm for the utilization of PRP in dermatology should be expanded.

CONCLUSION

PRP injections have high %efficacy in treating SD. There were no side effects reported following treatment. Therefore it is a novel, easily applicable therapy with promising results.

Author's Contribution:

Concept & Design of Study:	Sabah Ibad, Shaista Umbreen
Drafting:	Seemab Khan, Shaista Umbreen
Data Analysis:	Sumeera Zulfiqar
Revisiting Critically:	Sabah Ibad, Seemab Khan
Final Approval of version:	Sabah Ibad, Shaista Umbreen

Conflict of Interest: The study has no conflict of interest to declare by any author.

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