Section: Dermatology

Original Research Article

PERSPECTIVE STUDY OF EFFICACY AND SAFETY OF PLATELET RICH PLASMA THERAPY COMBINED WITH MICRO NEEDLING ON ACNE SCARS IN NORTH KARNATAKA POPULATION

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ABSTRACT

Background: Microneedling is a promising method for the treatment of acne scars, but the combined effect of PRP with microneedling remains unknown. **Materials and Methods:** 50 (fifty) adolescent patients with acne scars were studied 30 ml of blood from every patient was collected, and sodium citrate was added as an anticoagulant. The mixture was subjected to spin in a tabletop centrifuge machine with a swing-out rotator at 1500 rpm for 15 minutes (at 22°C room temperature). Twice PRP was extracted. Microneedles on a roller drum were used. Skin was stretched, and microneedling was carried out 4-5 times. PRP 2 ml was applied on both sides of the face and cheeks. The improvement was graded as poor, good, excellent. **Result:** The majority of the patients, 23 (46%), were aged between 21-25 followed by 22 (44%) who were aged between. Ice pick scars were highest at 22 (44%). Marked response to treatment was 20 (40%). 18 (36%) was excellent, 25 (50%) was good. Complication was transient erythema 50 (100%). **Conclusion:** Combined treatment with microneedling with PRP is more effective than microneedling without PRP for patients with acne scars.

INTRODUCTION

Acne vulgaris is a chronic inflammatory disease of the skin, which mainly involves the hair follicles and sebaceous glands. Acne is common, which could affect up to 80% of the adolescents.[1] The most common sequel of the acne is acne scars, which could be formed in about 50% of people with acne, most commonly in highly visible areas such as faces and cheeks.[2] Atrophic acne scars are the most common type of acne scars, which significantly affect the beauty of the patients and also impair the quality of life for the same patients.[3] The pathogenesis of atrophic acne scars is complicated, which mainly involves the degradation of inflammatory mediators, collagen fibers, and subcutaneous fat, ultimately leading to the change of subcutaneous collagen deposition.[4] Multiple treatment strategies have been developed for the clinical management of acne scars. Hence an attempt is made to treat such patients with platelet-rich plasma therapy combined with microneedling on acne scars.

MATERIALS AND METHODS

Fifty (50) patients regularly visited Dermatology department of Khaja Banda Nawaz Medical college hospital Kalaburgi, Karnataka were studied.

Inclusion Criteria: Patients >18 years of age, having atrophic acne scars, willing to follow up. Patients who gave their consent in writing for study were selected.

Exclusion Criteria: Patients below 18 years, positive history of keloidal tendency, pregnant, bleeding disorder or any active skin infections, SLE were excluded from study.

Method: 30 milliliter (ml) blood was drawn from every patients using 18 gauge scalp vein set into two 15 ml conical bottom plastic tubes, sodium citrate as an anticoagulant was added to the blood in the ratio of 1:9. The mixture was subjected to spin in a table top centrifuge machine with swing out rotator at 1500 rpm for 15 minutes, at room temperature of 22OC in order to obtain a platelet count 4-5 times higher than the base line (i.e., 8-9 lakhs/µl). Three layers are formed: the bottom layer consisting of RBR's, the middle of 4 weeks each. At the end of six treatments, the scars were graded using grading system as used

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in the beginning. Photographs of both sides of the face were taken under consistent background, position and lightening and compared with the pre-treatment images. The improvement was rated as poor, good and excellent depending up on the change in the grade of acne scars by both treating physician and the patient. An improvement by two grades was considered as excellent, one grade was rated as good, and no upgradation on assessment was labeled as poor response.

DLQI (Dermatology life quality Index) was calculated as following before and after the treatment

0 – 1 → No effect at all on patients life
2 – 5 → Small effect on patients life
6 – 10 → Moderate effect on patients life
11 – 20 → Very large effect on patients life
21 – 31 → Extremely large effect on patients life

Duration of study was December 2023 to November 2024.

Statistical Analysis: Demographic detail of different age groups, gender, characteristics of acne scars, life type of scars, response to treatment, patient's satisfaction score, and complications were studied and classified with percentage. The statistical analysis was carried out using SPSS software. The ratio of male and female was 1:2.

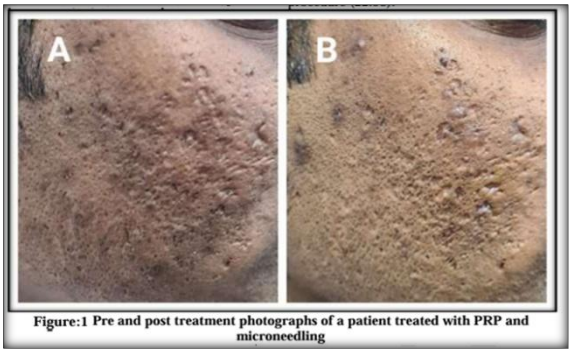

Figure:1 Pre and post treatment photographs of a patient treated with PRP and microneedling

Figure 2 Pre and post treatment photographs of a patient treated with PRP and microneedling showing moderate response

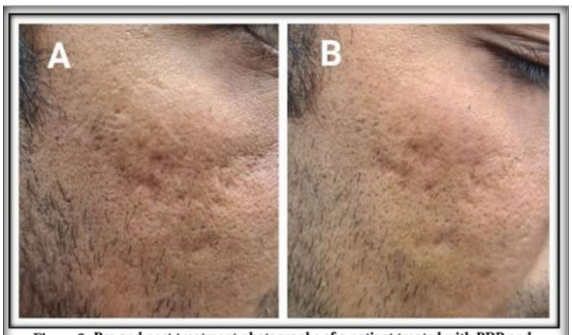

Figure 3: Pre and post treatment photographs of a patient treated with PRP and microneedling showing marked response

RESULTS

Table 1: Study of demographic details in acne scar patients

- Age groups (years): 3 (6%) less than 20, 23 (46%) ages between 21-25, 22 (44%) ages between 26-30, 2 (4%) > 30 years of age.
- Gender: 36 (72%) were male and 14 (28%) were female.

Table 2: Characteristics of acne scars among the patients

- Types of scars: 8 (16%) box scars, 20 (40%) rolling scars, 22 (44%) ice pick scars.
- Response to treatment: 20 (40%) marked, 18 (36%) moderate, 7 (14%) mild, 5 (10%) none
- Patients satisfaction score: 7 (14%) poor, 25 (50%) good, 18 (36%) had excellent
- Complications: 50 (100%) transient erythema

Table 3: Mean value of DLQ1 score was 22.95 before treatment, 8.8 after the treatment.

Table 1: Study of demographic details in Acne scars patients

1) Age groups (in years)	No. of patients (50)	Percentage (%)
Less than 20	3	6
21-25	23	46
26-30	22	44
More than 30	2	4
2) Gender		
Male	36	72
Female	14	28

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Table 2: Characteristics of acne scars among the patients

Characteristics	Type of scar	No. of patients (50)	Percentage (%)
(A) Type of scars	Box scar	8	16
	Rolling scar	20	40
	Ice pick scar	22	44
(B) Response to treatment	Marked	20	40
	Moderate	18	36
	Mild	7	14
	None	5	10
(C) Patients satisfaction score	Poor	7	14
	Good	25	50
	Excellent	18	36
(D) Complications	Transient Erythema	50	100
	Post-inflammatory Hyper pigmentation	0	0
	Pain	0	0
	Secondary infection	0	0

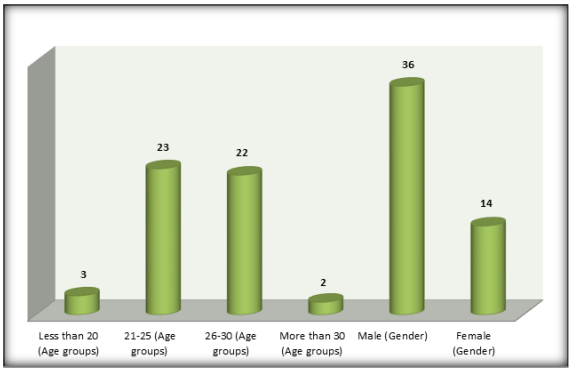

Figure 1: Characteristics of acne scars among the patients

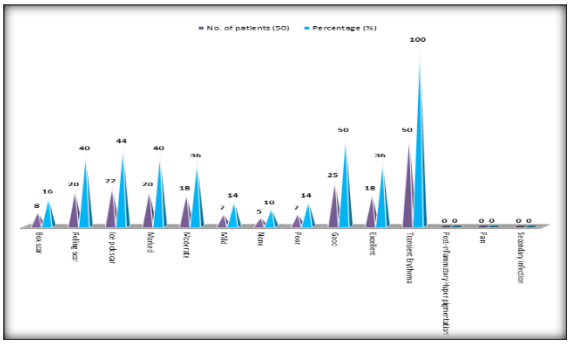

Figure 2: Characteristics of acne scars among the patients

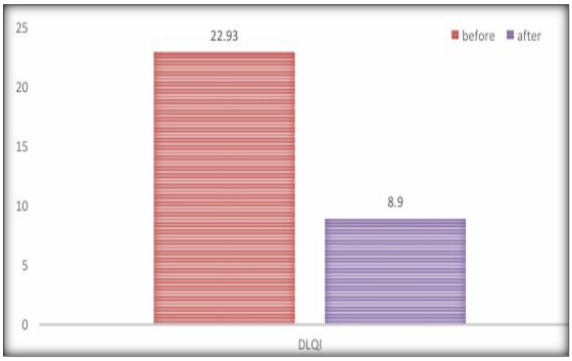

Figure 3: Mean value of DL QI Before and after treatment

Figure: Graphic comparison to show the mean value of DLQ1 before and after the treatment.

DISCUSSION

Perspective study of efficacy and safety of PRP therapy combined with microneedling on acne scars. The highest number of patients were aged between 21-25 years, with 23 (46%), followed by 26-30 years, with 22 (44%), and the least number was observed in those more than 30 years old, with 2 (4%). 36 (72%) were male, and 14 (28%) were female (Table 1). The types of scars had a majority of 22 (44%) ice pick scars, followed by 22 (40%) rolling scars, and 8 (16%) were the least, box scars. The marked response in 20 (40%) of patients and 5 (10%) had no response. 18 (36%) had excellent, 25 (50%) had good, and 7 (14%) had poor satisfaction. The complication was transient erythema 50 (100%) (Table 2). DLQ1 score was 22.95 before treatment, 8.8 after treatment (Table 3) (Figure 1, 2 and 3). These findings are more or less in agreement with previous studies.[5,6,7]

Microneedling is well applied as an effective and minimally invasive technology for the treatment of atrophic acne scars via the creation of skin micro-wounds to induce collagen production and dermal remodeling. Besides, platelet-rich plasma (PRP), which contains various growth factors and bioactive cytokines, has been applied as adjuvant therapy for acne scars.[8] PRP enables vascular endothelial growth factor and fibroblast growth factors. The microneedling therapy may enhance the absorption of cytokines that remodel the skin.[9] Recent studies have revealed that combined therapy of PRP and microneedling has excellent improvement of skin lesions, more significant deposition of collagen and elastic fibers with increased proliferative activity in the epidermis in the people with acne scars, which may also reflect the synergistic benefits of both PRP and microneedling.[10]

It is reported that PRP promotes regeneration, renewal, and wound healing. PRP has been utilized as the latest therapy in the field of dermatology because it has a natural capacity to heal scars resulting from recovery of damaged tissue after inflammation caused by the disease process.[11] Moreover, PRP is more affordable.

It is also hypothesized that the epidermis of the skin is ectodermal in origin while the dermis is

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mesodermal; hence, acne scars are correlated to or respond to hyper- or excess secretion of neurotransmitters, which regulate mood elevation, depression, and anxiety in adolescents; therefore, acne and acne scars are more prevalent or significant in adolescents with psychosomatic or depressive illnesses. Hence, along with the present treatment, the patients psychotic illnesses, i.e., sleep disturbances, mood disorders, and anxiety, have to be evaluated.[12]

CONCLUSION

Present a perspective study of the efficacy and safety of PRP therapy with microneedling on acne scars. PRP technique used as adjuvant therapy along with microneedling to treat acne scars PRP is also a simpler, cheaper, and relatively safer procedure. PRP combined with microneedling is a better treatment option than microneedling alone for treating atrophic acne scars. The present study demands further pathophysiological, biomechanical studies because the effect of micro-needling combined with PRP remains unknown.

Limitation of study: Owing to the tertiary location of the research center, a small number of patients, lack the latest techniques, and we have limited findings and results.

- This research work was approved by the ethical committee of Faculty Medical Science Khaja Banda Nawaz University, Kalaburgi-585104, Karnataka.
- No Conflict of Interest
- Self-funding

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