

Original Article

Outcome of combination of microneedling with platelet rich plasma in the treatment of patients with post acne scarring

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Abstract

Objective To determine the outcome of combination of microneedling with PRP in patients with post-acne atrophic scars attending the Dermatology Department in a tertiary care hospital of Lahore

Methods A descriptive case series was performed on a total of 60 patients with post acne scars who fulfilled a predefined inclusion criterion. Informed consent was taken. Relevant information about the patient's demographic data and grade of acne scarring was noted along with baseline photography. All patients were given three sessions of microneedling with PRP at one month intervals, using standard treatment protocol and the scars were graded four weeks after the 3rd session using the same grading system. Photographs were taken at each visit and 3 weeks after the last visit. The effectiveness of treatment was determined as per decided operational definition. Data was analyzed using SPSS version 17.

Results Total of 60 patients completed the study, having mean age of 28.65 years. Most of them were females. The effectiveness of treatment in terms of reduction in grade of acne scarring in one or more grades from baseline was observed in 78.33% (47), while in 21.67% (13) treatment was not effective.

Conclusion Microneedling combined with topical PRP is effective in treatment of post acne atrophic scars.

Key words

Post acne scars; Microneedling; Platelet rich plasma.

Introduction

Acne Vulgaris is a disease that affects pilosebaceous follicles resulting in comedones, papules, pustules and nodules. This may result in scarring and disfigurement. The prevalence of acne vulgaris is over 90% among adolescents with psychological and social implications of high gravity such as anxiety and depression.¹ The typical sites involved are the face, back and chest as they have high concentration of

pilosebaceous glands.

Permanent scars are a consequence of healing of damaged skin following active acne lesions. The severity of scarring depends on delays in treating active acne lesions. The scars may be hypertrophic, keloidal or atrophic. Atrophic scars are subclassified into boxcar, rolling and icepick scars.²

Prevention is the main strategy in order to avoid the appearance of post-acne scars.³ However, once the scars have appeared it is very important to treat them timely to avoid their deleterious impact on quality of life of patients. Treatment

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options include chemical peeling, laser treatment, dermabrasion, fat transplantation, punch techniques, needling, subcision, and combination therapies.

Microneedling in combination with platelet rich plasma (PRP) is a treatment option in post-acne scarring. Microneedling results in the release of active growth factors which in turn stimulates collagen synthesis and neovascularization and is the basis of healing of acne scars. Platelet rich plasma is derived from an autologous blood sample, obtained by sequestering and concentrating platelets following differential centrifugation of the sample.

However, the literature regarding the efficacy of PRP in the treatment of acne scars is scarce with varying results.⁵ A split face study conducted by Chawla on 30 patients with post acne scars where patients were given 4 sessions of microneedling and PRP on one side and microneedling and topical vitamin C on the other. Twenty-seven patients completed the study out of which, 18.5% showed an excellent response to PRP compared to 7% with topical vitamin C.⁴

The rationale of our study is to conduct a study on outcome of combination of microneedling with PRP in the treatment of post acne scars as no study is available so far regarding its effectiveness in the local population.

Patients and Methods

This study was conducted in the outpatient Department of Dermatology, Jinnah Hospital, Lahore. The study duration was 6 months from 25 August 2017 to 25 February 2018. After approval from the Institutional Review Board, study patients were enrolled using non-probability consecutive sampling. Patients with ages between 15 and 35 years, of either sex, fulfilling the inclusion criteria of Grade 3 or 4

acne scars on the Goodman and Baron scale⁶ and those who had not taken any treatment for their acne scars in the last 3 months were enrolled in the study. All patients with active acne, a history of keloid scarring, a deranged PT >14s or deranged APTT >33s were excluded. Other criteria for exclusion included, a platelet count <150000, any bleeding disorder, a positive serology for hepatitis B or C, those on any anticoagulant or steroid therapy and pregnant or lactating females.

After taking informed consent, relevant information related to patient demographic data, duration and grade of acne scarring was noted in a predesigned proforma. Baseline photography was also taken. All subjects were given 3 sessions of microneedling in combination with platelet rich plasma (PRP). The PRP was obtained by withdrawing 10ml of autologous blood. The blood was centrifuged at 1500rpm for 10 minutes using acid citrate dextrose as an anticoagulant. A second spin at 3500rpm for 10 min at room temperature resulted in a PRP sample containing platelets at 4.5 times the baseline amount. Calcium gluconate was used as an activator and 1mL was added for every 9mL PRP. All subjects were advised a 30 minute topical application of numbing cream prior to the procedure. Using aseptic measures, microneedling was performed using a dermapen with a 36 needle cartridge and at a depth of 1.5mm. The skin was stretched and microneedling performed in vertical, horizontal and both diagonal directions with four passes in each direction per session. Three sessions were performed at 4 weekly intervals. All subjects were advised on post procedure care, including use of ice packs and strict photoprotection. Photographs were taken prior to each session and the final outcome was assessed 4 weeks after the last session (i.e. 16 weeks after the first session). The acne scars were graded again and a 18.5% improvement in acne scars was considered as an effective outcome.

Patient data was entered and analyzed using SPSS version 17.0. Numerical variables like age etc. were summarized as mean and standard deviation. Qualitative variables e.g. sex and effectiveness of the treatment was represented in frequency/ percentages. Data was stratified for age, gender and duration of scarring and initial grade of scar. The chi square test was applied to check statistical significance. A p-value ≤ 0.05 was considered as statistically significant.

Results

A total of 60 patients were enrolled in this study. Patients were selected from Dermatology Out Patient Department Jinnah Hospital, Lahore with Grade III to Grade IV post acne atrophic scars. All of them completed the study.

The patients' ages ranged from 20-35 years with mean $\pm$ SD as 28.65 $\pm$ 3.76 years. Age distribution of patients showed that majority of patients were above 25 years of age i.e. 80% (48), while 20% (12) were younger than 25 years. Gender distribution showed that 48.3% (21) were males while 51.7% (31) were female. Duration of acne scars ranged from 6 months to greater than 5 years. Of the study population (60), 10% (6) had duration of scars between 6 months to 2 years, in 43.3% (26), duration of acne scars was 2.1 years to 5 years, while in 46.7% (28), the duration of scars was greater than 5 years. At the start of study 45.00% (27) had grade III scarring while 55.00% (33) had grade IV scarring (**Figure 1**). At completion of study of 36.67% (22) had scarring of grade II, 56.67% (34) had grade III scarring, while 6.67% (4) had grade IV scarring (**Table 1**).

Of 60 enrolled patients, 78.33% (47) showed one or more reduction in grade from baseline while in 21.67% (13) treatment was not effective.

The chi-square test was applied for stratification

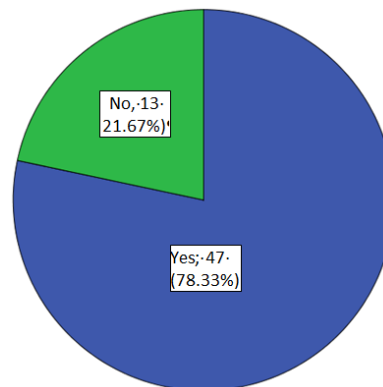


Figure 1 Effectiveness of treatment.

Table 1 Baseline characteristics of study group.

Characteristics	Participants (n=60)
Age (years)	28.65 $\pm$ 3.76
<25years	12 (80%)
>25years	48 (20%)
Gender	
Male	21 (48.3%)
Female	31 (51.7%)
Duration of scarring	
6months-2 years	6 (10%)
2.1 years to 5 years	26 (43.3%)
More than 5 years	28 (46.7%)
Grade of scarring	
Grade III	27 (45%)
Grade IV	33 (55%)

of data for variables like age, gender, duration of scars and baseline scar grades and P value was calculated which came out to be 0.060, 0.653, 0.687 and 0.047 respectively. P value of the baseline scar grades came out to be 0.047 which was statistically significant (**Table 2**).

Discussion

Microneedling is collagen induction therapy that results in the release of various cytokines that induce neocollagenesis with subsequent healing of scar. This can be done alone or combined with various other therapies like PRP, vitamin C, glycolic acid peels and TCA peels. In this study we enrolled 60 patients presenting to the dermatology OPD at our hospital with mean age of 28.6 year. Each patient underwent three sessions of combination of microneedling with PRP at an interval of one month and followed up

Table 2 Stratification of efficacy of PRP with microneedling in atrophic acne scars.

Subgroup	n	Efficacy n (%)	P value
Age			
<25 years	12	7 (14.9%)	0.060
≥25 years	48	40 (85.1%)	
Gender			
Male	21	22 (46.8%)	0.653
Female	31	25 (53.2%)	
Duration of scarring			
6 months to 2 years	6	4 (8.5%)	0.687
2.1 years to 5 years	26	20 (42.6%)	
More than 5 years	28	23 (48.9%)	
Grade of acne scarring			
Grade III	27	18 (38.3%)	0.047
Grade IV	33	29 (61.7%)	

four weeks after the last session. We used a dermapen with microneedle of 1.5mm length and 36 needles. All 60 patients completed the study, out of which 47 (78.33%) patients showed improvement in terms of reduction in grade of acne scarring by one or two grades while 13 (21.67%) showed no improvement.

A study was conducted by Chawla in India in 2014, on patients of post acne scar. The mean age in the study was 27.5 years while in our study mean age was 28.6 years. Each patient was given 4 sessions of combination of microneedling with PRP⁴ while in our study patients underwent total 3 sessions. Twenty one (77.7%) out of 27 patients showed improvement in scarring by one or more grades from baseline. These results were comparable with our study that showed improvement in 78.33%.

Asif M in 2016,⁵ evaluated the efficacy of platelet rich plasma with microneedling in post acne atrophic scars by performing three consecutive sessions at one month interval in 50 patients. The mean age of their study population was 24.5 years compared to 28.6 years in this current study. This study showed 62.20% improvement in post acne scarring. The results were comparable, with 78.33% improvement seen in our study.

Another study by Ranjan S et al.⁷ in India had results of 100% improvement in acne scars following microneedling with PRP. He had a reduction in acne scar grade by one or more.

A study by Fabbrocini,⁸ found that PRP combined with microneedling was more effective in treating acne scars, compared to microneedling alone. The study was performed on twelve patients and showed greater reduction in the scars severity grade on the side treated with microneedling and PRP compared to microneedling alone.

Thus, the results of our study correlate with other similar studies carried out in different regions. The combination therapy should be preferred as compared to microneedling alone.

Conclusion

In our population microneedling with PRP is an effective treatment modality as 78.33% patients with post acne scars had an improvement in grade of acne scars.

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