



The use of PRP and dermal subcision for acne scars

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ABSTRACT

Background: Scaring in acne remains a common problem and became therapeutic challenges for the clinician. Several modalities were introduced and combination therapies are required to achieve satisfactory results. Subcision worked by tunneling the connective tissue and scattered the fibrosis scar. Platelet-rich plasma (PRP) influences wound-healing by stimulating an intense inflammatory response and growth factors, these increase in the production of extracellular matrix and granulation tissue occurs, with vascular ingrowth fibroblastic proliferation and collagen production also accelerated.

Methodology: It was a medical therapeutic study conducted over a period of 6 months. Twelve patients successfully completed the trial. patients suffering from atrophic post acne scars received PRP injection in combination with subcision for 3 sessions with one month interval. The assessment was done using Goodman and Baron Scale and Global aesthetic improvement scale (GAIS) to evaluate the results after each treatment session and 3 months after the last treatment.

Objective: To evaluate the efficacy and safety of platelet rich plasma (PRP) as a combination therapy to subcision in the treatment of atrophic post acne scars.

Keywords: PRP, Subcision, Acne, Goodman, Baron

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Introduction

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous and among the most common dermatological conditions worldwide with an estimated 650 million people affected.¹

Moreover, acne causes profound negative psychological and social effects on the quality of life of patients.²Acne develops in the pilosebaceous unit and involves many processes.

Some of the key features underlying acne development include:

Disturbed sebaceous gland activity associated with hyperseborrhoea (excessive sebum) and alterations in sebum fatty acid composition, dysregulation of the hormone microenvironment, interaction with neuropeptides.Follicular hyperkeratinization, induction of inflammation and dysfunction of the innate and adaptive immunity. These processes impair functioning of the pilosebaceous unit, which leads to the transition of a normal pore to microcomedones, and further to comedones and inflammatory



lesions. Bacterial antigens can potentiate the inflammatory process⁵. Genetic studies of heterozygous and homozygous twins and family studies have produced a growing body of evidence for the role of hereditary factors in the risk of acne development⁶. Acne can also be triggered or worsened by, for example, ultraviolet radiation and other environmental factors⁷ dietary factors⁸, smoking⁹, stress and the modern lifestyle¹⁰.

Acne is generally limited to the parts of the body that have the largest and most abundant sebaceous glands the face, neck, chest, upper back, and upper arms.

Individual lesions are centered about the pilosebaceous follicles, which open onto the skin surface as the pores of the skin. The skin may have an oily texture and appearance, reflecting increased sebum production. Non-inflammatory acne lesions include **open and closed comedones**, **Closedcomedones** are known as **whiteheads** because they appear as whitish to flesh- coloured papules with an apparently closed overlying surface (although they do have minute follicular orifices). The approach depends on the severity of the acne, the treatment preferences and age of the patient, and adherence and response to previous therapy as mentioned in (Table 1).

Table 1:Approach to therapy for acne vulgaris

Severity clinical findings	Treatment options First line	Second line
Mild Comedonal papular/pustular	Topical retinoid Topical antimicrobial benzoyl peroxide clindamycin Combination products	Alternative topical retinoid Salicylic acid washes Alternative topical retinoid plus alternative topical antimicrobial Salicylic acid washes
Moderate Papular/pustular Nodular	Oral antibiotics tetracyclines erythromycin trimethoprim–sulfamethoxazole Topical retinoid ± benzoyl peroxide Oral antibiotic Topical retinoid ± benzoyl peroxide	Alternative oral antibiotic Alternative topical retinoid Benzoyl peroxide Oral isotretinoin Alternative oral antibiotic Alternative topical retinoid Benzoyl peroxide
Severe	Oral isotretinoin	High-dose oral antibiotic Topical retinoid (also maintenance therapy) Benzoyl peroxide



PATIENTS AND METHODS

This was an experimental analytical study conducted over a period of 6 months (from September 2021 to March 2022) in 24 patients with acne scars of Grades 1, 2, 3 according to [Goodman and Baron Grading scale] attending the Department of Dermatology at the Ibn Sina Teaching Hospital in Mosel city, Salah-AL-DEEN GENERAL Hospital in Tikrit City, IRAQ.

patients with facial acne scars type rolling, icepick, boxcar, Grades 1, 2, 3, Only patients with the same acne scar grade and type on both halves of the face were included to ensure matching and avoid bias. patients those with active acne under the scar or active infection and those with history of keloid scarring after trauma or surgery. Also, patients with bleeding diathesis, anticoagulant medication, antiepileptic drugs, diabetes mellitus, ischemic heart disease, HIV-seropositive status, collagen vascular disease, pregnant and lactating women.

PRP is obtained from a sample of patients' blood drawn at the time of treatment. PRP prepared by one-spin method. 10mls of blood was withdrawn and initially centrifuged at 1200 rpm for 10 minutes. The used tube was prp single use tube 8ml containing separation gel

and anticoagulant. The separated plasma 3mls was collected for each patient. 1-1.5mL of freshly prepared activated PRP was injected at the base of each subcised scar using a sterile insulin syringes 100ul 29G. Approximately 1.5 - 3 mL PRP was injected into each patient. A topical antibiotic (Fucidin cream 1%, samara drug industry) was applied to all patients after subcision for 2-3 days to prevent wound infection. Subsequent sessions were done with 4 weeks apart. The patients were seen regularly at the first visit, then 4 and 8 weeks after that respectively. At 3 months after the last session, a final follow up session to evaluate and record the final outcome.

Results

The study included 24 patients, (8 (33.33%) males and 16 (66.67%) females) that undergo PRP and subcision, the response rate was measured by patient satisfaction and dermatologist assessment by comparison of pre- and post- procedural evaluations and found that 6 cases (25%) had fair response, 5 cases (20.8%) had moderate response, 9 cases (37.5%) had good response, and 4 cases (16.7%) had excellent response as shown in Figure 1.

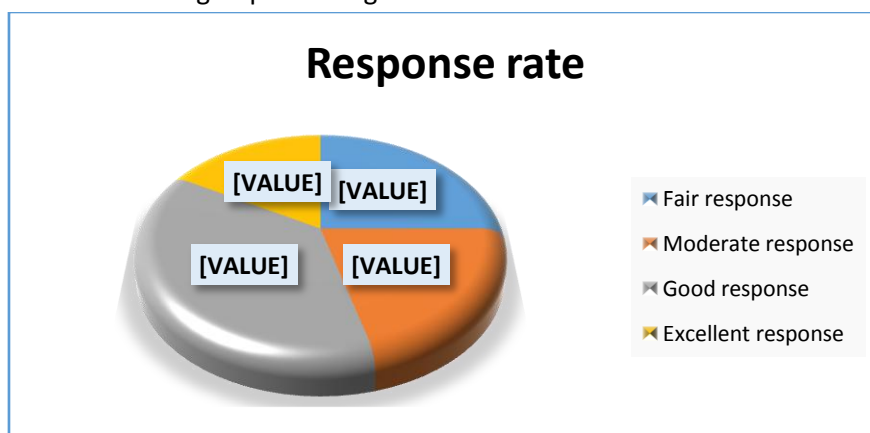


Figure 1: Distribution of cases according to response rate.

The younger age of participants associated with better response rate than older participants and this difference was statistically significant, as shown in Table 2.

Table 2: Distribution of the age according to response rate.

Response	Age in years			
	20-24	25-29	30-35	Total
	No. (%)	No. (%)	No. (%)	No. (%)
fair response	1 (12.5)	2 (20)	3 (50)	6 (25)
moderate response	0 (0)	4 (40)	1 (16.7)	5 (20.8)
good response	3 (37.5)	4 (40)	2 (33.3)	9 (37.5)
excellent response	4 (50)	0 (0)	0 (0)	4 (16.7)

* P value 0.034 (calculated after removal of empty cells).

The response rate was different according to the type of the scar, (p value: 0.016), 58.3% of the cases (14 case) had icepick scars, the response rate ranged from fair to good response, the rolling scar (25% of the cases) on the other hand, had response rate ranged from good to excellent, lastly the boxcar scar(16.7% of he cases) had fair to good response rate, the distribution of the cases according to the type of the scar further explained in **Error! Reference source not found.3**.

Table3: Response rate according to the type of the scar.

Response	Type of scar			P value
	Icepick	Rolling	Boxcar	
	No. (%)	No. (%)	No. (%)	
Fair	5 (35.7)	0 (0)	1 (25)	0.016
Moderate	4 (28.6)	0 (0)	1 (25)	
Good	5 (35.7)	2 (33.3)	2 (50)	
Excellent	0 (0)	4 (66.7)	0 (0)	
Total	14 (58.3)	6 (25)	4 (16.7)	

The grade of the scar, was significantly different in response rate, the study included 16 cases (66.7%) grade II with rage of response from fair to excellent but the majority of grade two had good response (50%), grade III scar was found in 4 cases (16.7%) all of them described the response to be moderate, on the other hand majority of grade IV scars had fair response, as explained in Table 4.

Table 4. Response rate according to the grade of the scar.

Response	Grade of the scar			P value
	II	III	IV	
	No. (%)	No. (%)	No. (%)	
Fair	4 (25)	0 (0)	2 (50)	0.001
Moderate	0 (0)	4 (100)	1 (25)	
Good	8 (50)	0 (0)	1 (25)	
Excellent	4 (25)	0 (0)	0 (0)	
Total	16 (66.7)	4 (16.7)	4 (16.7)	



Discussion

Atrophic acne scars (icepick, rolling, and boxcar) are the most common type of scars, many modality had been used to treat such scars with variable response rate⁽¹¹⁾, the subcision with concomitant PRP injection had a promising outcome as claimed by many studies⁽¹²⁾, this study aimed to investigate the patient satisfaction (the response rate) after subcision with concomitant PRP.

The younger age group had found to be associated with better response rate, similarly Tirmizi et al⁽¹³⁾ (n=50) found that cases below age of 31 years had better response rate to acne management than those older than 31 years.

The type of the scar was different in response rate with best response found in rolling scars and the poorest response was in icepick scars. Comparable result found by Kamel et al⁽¹⁴⁾ in their study where 20 patients selected with atrophic acne scars, one facial side was treated with subcision plus PRP, and the other was treated with the same combination plus CROSS technique (trichloroacetic acid 50%) for 3 sessions at 3-week intervals and found that rolling scars associated with best outcome, while icepick scars had the poorest response rate.

Fiqri et al⁽¹⁵⁾ in their case report of treating 25-year-old man complained of acne scars on both sides of his face. Dermatologic findings were blackheads, icepick, boxcar, and rolling scars. Clinically he had moderate to severe acne scores. He was treated with a combination of CROSS TCA for icepick-type acne scars, modified subcision, and PRP injection for rolling and boxcar-type acne scars on both sides of the face and founded that rolling scars had a good to excellent response, while icepick scars had only mild response.

Deshmukh et al⁽¹⁶⁾ in their study had a longer follow up period (2 years) also found similar

result that rolling scars were the best responder scars. Although no patient had a unique scar type, but mixture of all types of atrophic scars, thus patient reporting the response rate may be interpreted to all the facial scars rather than type specific, thus to overcome this problem photographic reporting of the response rate and response was judged by other dermatologist, for better achievement of unbiased assessment. On the other hand, the dermatologist was more type oriented in the assessment by comparing of pre and post procedural photographs. The icepick scars configuration had deeper base than both rolling and boxcar scars, thus response rate to all types of treatment is lower than other types, as stated by Connolly et al⁽¹⁷⁾.

In the current study we examined the use of both PRP and subcision for treatment of acne scars, this approach of treatment was little done in previous studies, as previous studies examined only one type in comparison to the other one, this study highlight the effectiveness of the additional benefit of PRP injection with subcision sessions.

The grade of the scar was significantly different regarding response rate, with best response rate observed in cases of low grade especially grade II scars (50% of them had good response and 25% had excellent response rates). Similar result found by Deshmukh et al⁽¹⁸⁾ found that both subcision and PRP injections associated with better response in low grade scars.

Bhargava et al⁽¹⁹⁾ in their study A total of 45 patients underwent four sessions, four weeks apart, of subcision and microneedling and were assessed for scar grading three months after the final treatment session, found that the best response was achieved in low grade scars.

The subcision alone is effective in release of fibrous tissue leading to elevation of the depressed scar as stated by Bhargava et al⁽¹⁹⁾. Furthermore, Kroumpouzou et al⁽²⁰⁾ found that



the addition of PRP had additional improvement in response, as PRP act to separate the dermis from the fibrous tissue underneath and thus better healing when used in addition to subcision, than subcision alone. Hassan et al⁽²¹⁾ found in their study where compared the effect of PRP alone, and subcision in additional to PRP, found that better response was found in cases of the combined therapy, this finding highlight the therapeutic benefits for adding one modality to other than the use of single approche.

Conclusions

The use of the subcision with PRP injection had favorable outcome as treatment of atrophic acne scars. This study may be considered as a pilot study for larger sample sized study with inclusion of other treatment modality to better estimate the efficacy

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