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Original Article

Assessment of efficacy of Platelet rich plasma therapy for acne scars

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***ABSTRACT*:**
Background: Acne vulgaris is one of the most common dermatological disorders affecting significant number of patients. The present study was conducted to assess the efficacy of platelet rich plasma for acne scars. **Materials & Methods:** The present study was conducted on 112 patients diagnosed with acne vulgaris of both genders. Patients were divided into grade 1, 2 and 3 based on Goodman and Baron scale. In all patients, the region was treated with topical anesthetic 2% lidocaine hydrochloride, followed by gentle cleansing with distilled water. The injection sites were injected with the application of 0.5ml of autologous platelet- -rich plasma on one side of the face and neck. The grade, type and patients satisfaction was evaluated. **Results:** Age group <20 years had 6 males and 20 females, 20-25 years had 10 males and 36 females, 26-30 years had 4 males and 18 females and >30 years had 8 males and 10 females. Rolling scars were seen in 56, boxcar in 14 and both in 42 patients. The difference was significant (P< 0.05). There was marked improvement in 66, moderate in 40, mild in 4 and no improvement in 2 patients. Excellent score was observed in 45, very good in 36, good in 22 and fair in 8. **Conclusion:** PRP found to be effective in management of Acne vulgaris. There was significant improvement in patient grade and satisfaction level.
Key words: Acne vulgaris, Platelet- -rich plasma, Satisfaction.

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INTRODUCTION

Acne vulgaris is one of the most common dermatological disorders that afflict people in their adolescence.[1] Acne vulgaris or simply known as acne is a human skin disease characterized by skin with scaly red skin (seborrhea), blackheads and whiteheads (comedones), pinheads (papules), large papules (nodules), pimples and scarring. Acne vulgaris is a disease of pilosebaceous unit characterized by the formation of open and closed comedones, papules, pustules, nodules and cysts. Acne affects skin having dense sebaceous follicles in areas including face, chest and back.[2] Acne is not life threatening but severe acne can affect psychological status and social activities. Acne scarring can produce severe disfigurement of face. Scarring is a complex biological process that involves various chemical mediators, extracellular matrix, parenchymal resident cells and infiltrating blood cells.[3]

Platelet-rich plasma (PRP) is an autologous blood-derived product enriched in platelets, growth factors and chemo/cytokines delivered in a concentrated volume of plasma. Since the 1970s, PRP has received significant attention as applied to tissue repair and regeneration. Initial studies focused predominantly on applications within the musculoskeletal and maxillofacial fields; however, in recent years, it has been used for a range of dermatological indications including wound healing, fat grafting, alopecia, scar management as well as soft-tissue volume augmentation.[4] The present study was conducted to assess the efficacy of platelet rich plasma for acne scars.

MATERIALS & METHODS

The present study was conducted in the department of Dermatology. It comprised of 112 patients diagnosed with acne vulgaris of both genders. All were informed regarding the stud and written consent was obtained. Ethical clearance was taken from institutional ethical committee.

General information such as name, age, gender etc. was recorded. Patients were divided into grade 1, 2 and 3 based on Goodman and Baron scale. Grade 1 was erythematous cutaneous lesions in the face and neck, grade 2 mild atrophic scars in the face, grade 3 moderate atrophic scars in the neck and face = 50 cm and grade 4 were severe scars >50 cm. One side of face was treated with PRP while other was not. Dermatology Life Quotient Index(DLQI) was calculated before and after the completion of the treatment.

For preparation of PRP, 49.5 ml of venous blood sample were harvested from the cephalic vein and transferred to tubes containing 0.5 ml of sodium citrate. One of the tubes was reserved for the baseline platelet count. The remaining samples were centrifuged for 10 minutes at 240g, 20º C. Approximately 8 ml of PRP were obtained with this process. Ten percent (10%) calcium gluconate were added in order to activate the platelets.

In all patients, the region was treated with topical anesthetic 2% lidocaine hydrochloride, followed by gentle cleansing with distilled water. The injection sites were injected with the application of 0.5ml of autologous platelet- -rich plasma on one side of the face and neck. Multiple subdermal injections were performed. The patient was instructed to avoid direct exposure to the sunlight during the treatment and use wide spectrum SPF 50 sunscreen daily. The patient underwent 3 treatments with intervals of 1 month between each session. The grade, type and patients satisfaction was evaluated. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

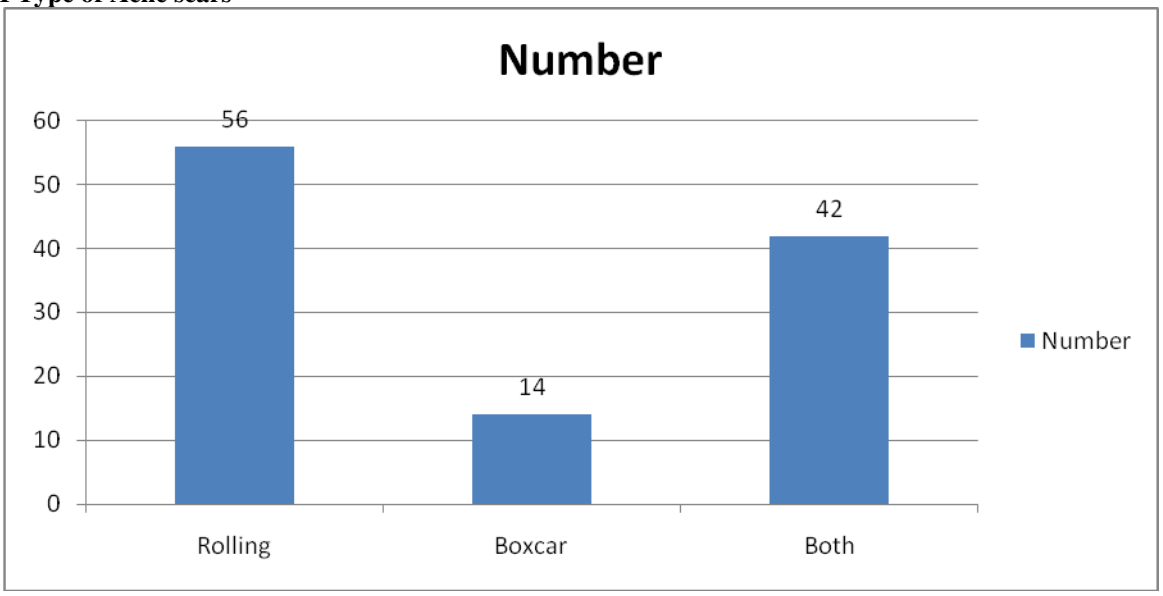
RESULTS

Table I Age and gender wise distribution of patients

Age group (years)	Males	Females
<20	6	20
20-25	10	36
26-30	4	18
>30	8	10
Total	28	84

Table I shows that age group <20 years had 6 males and 20 females, 20-25 years had 10 males and 36 females, 26-30 years had 4 males and 18 females and >30 years had 8 males and 10 females.

Graph I Type of Acne scars



Graph I shows that rolling scars were seen in 56, boxcar in 14 and both in 42 patients. The difference was significant (P< 0.05).

Table II Improvement in grade

Improvement	Number	P value
No improvement	2	0.01
Mild	4	
Moderate	40	
Marked	66	

Table II shows that there was marked improvement in 66, moderate in 40, mild in 4 and no improvement in 2 patients. The difference was significant (P< 0.05).

Table III Patients' satisfaction score

Patients' satisfaction score	Score	No. of patients
Poor	0	1
Fair	1	8
Good	2	22
Very good	3	36
Excellent	4	45

Table III shows excellent score in 45, very good in 36, good in 22 and fair in 8.

DISCUSSION

Acne is a disease of pilosebaceous unit, most commonly affecting adolescents, clinically characterized by pleomorphic variants of lesions like papules, pustules, comedones, nodules and cysts . It is in most cases a self-limiting disease. It is however associated with variable amount of scarring, so there can be life long sequelae in form of atrophic or hypertrophic scar formation. In some patients, the scarring is minimal, however in some scarring may be severe. The cause of this scarring is basically defective wound healing.[5]

Autologous PRP has been found to stimulate fibroblast growth and therefore helps in scar healing. Modern technology allows us to concentrate platelets and white blood cells from a patient's blood (autologous therapy) and to induce the release of growth factors by injecting the solution directly into injured tissue, stimulating the same healing process but in a more directed form.[6] The present study was conducted to assess the efficacy of platelet rich plasma for acne scars.

In present study, age group <20 years had 6 males and 20 females, 20-25 years had 10 males and 36 females, 26-30 years had 4 males and 18 females and >30 years had 8 males and 10 females.

We found that rolling scars were seen in 56, boxcar in 14 and both in 42 patients. There was marked improvement in 66, moderate in 40, mild in 4 and no improvement in 2 patients. Nofal et al[7] in their study acne scars grades 1, 2 and 3b treated with platelet rich plasma and highlighting the effectiveness of the treatment. Platelet rich plasma was applied for three months in the left side of the face of a patient bearing acne. In the clinical and photographic evaluations, there was improvement in the skin appearance and quality, less number of lesions and decrease of pain.

Alsousou et al[8] in their study found that among the types of scars, it was rolling type of scars (45%) that out numbered others followed by combination of both rolling and boxcar scars. PRP holds good promise for the management of acne scars. Marked to moderate improvement was seen in 77.5% cases, which was comparable with other modalities used for management of acne scars. In most cases the improvement became visible at the end of 3rd sitting.

We found that excellent score was seen in 45, very good in 36, good in 22 and fair in 8. Tehranian et al[9] found that Improvement in DLQI was also impressive with increase in mean DLQI from 22.9 to 8.9 and the patient's satisfaction ranged from 'very good to good' in around 80% cases.

According to The American Association of Blood Banks technical manual, first the 'platelet-rich plasma' is separated from whole blood by 'soft or light-spin' centrifugation and subsequently the platelets are concentrated by ' hard or heavy-spin' centrifugation . After which the supernatant plasma is removed. The basic principle behind the PRP separation procedure is as follows: Different blood components have different specific gravities. So on centrifugation they get separated into different layers.

CONCLUSION

PRP found to be effective in management of Acne vulgaris. There was significant improvement in patient grade and satisfaction level.

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