A COMPARATIVE STUDY OF COMBINED MICRONEEDLING WITH PLATELET RICH PLASMA VERSUS MICRONEEDLING ALONE IN ACNE SCAR

Dermatology

Dr. Yogesh Patel* Assistant Professor, Dept. of Dermatology, GMC Surat * Corresponding Author

Dr. Brijesh Parmar Associate Professor, Dept. of Dermatology, GMC Surat

Dr. D. D. Umrigar Former Professor & Head, Dept. of Dermatology, GMC Surat

ABSTRACT

Background: Scarring is common complication of acne. Microneedling is well accepted modality of treatment for atrophic acne scar. Platelet rich plasma (PRP) is newer option in acne scar management. **Aim:** To compare efficacy of combined microneedling and PRP with microneedling atrophic acne scar. **Materials and Method:** A total of 34 patients of atrophic acne scar were included in study. Right side of face was treated with combined microneedling and PRP and left side of face treated with microneedling alone. Total three sitting of treatment given at monthly interval. Final assessment was done using physician satisfaction score and Goodman and Baron acne scar grading one month after last sitting. **Result:** A total of 34 patients enrolled out of which 2 were dropped out 32 patients had included in final analysis. The baseline mean Goodman and Baron Score of both side of face was 2.72 ± 0.45 which was reduced to 2.2 ± 0.4 and 2.37 ± 0.5 on right side and left side of face respectively. The mean physician satisfaction score was 2.16 ± 0.79 and 1.91 ± 0.8 on right side and left side of face respectively. **Conclusion:** Combined approach using microneedling with PRP is a better option than microneedling alone in acne scar management clinically.

KEYWORDS

Acne scar, microneedling, PRP

INTRODUCTION

Atrophic acne scarring is a consequence of abnormal resolution or wound healing following acne inflammation. They are broadly classified as macular, atrophic and hypertrophic or keloidal scars. Atrophic acne scars are further divided into three types: icepick, boxcar, and rolling scars.^[1]

The lesions can be assessed using Goodman's Qualitative scale and Quantitative scale.^[2]

Microneedling has become an important treatment modality for acne scars. The principle of using microneedling is to initiate collagen synthesis. This is achieved by causing minute injury to the dermis with the use of microneedles. The needles are so fine and thin that tissue damage is almost negligible.^[3]

Autologous platelet-rich plasma (PRP) contains high concentrations of platelet growth factors. Platelets on activation release several growth factors and cytokines; this improves dermal regeneration and acts locally to promote protein and collagen synthesis, causes endothelial migration or angiogenesis. This collagen deposition is responsible for reducing the scars.^[4]

AIMS AND OBJECTIVES

To compare efficacy of combined microneedling and PRP with microneedling alone in atrophic acne scar.

METHODOLOGY

Study was conducted at tertiary care hospital of South Gujarat for a period of one year.

Patients were included according following criteria. Inclusion criteria: (1) Age more than 18 years. (2) Patients with acne scar grade II to IV with equal scarring on both side of face (Goodman and Baron acne scar classification)

Exclusion criteria: (1) Active acne (2) Active infection (3) History of keloid (4) Bleeding tendency (4) Pregnancy and lactation (5) Patient having HIV, HBsAg or other chronic infection After taking consent, detailed history and clinical examination was done. All patients were investigated for complete blood count, platelet count and other necessary investigation if required. Treatment area was anaesthetized with topical anaesthetic cream and procedure was conducted under proper aseptic condition. Right side of face was treated with combined microneedling and PRP while left half of face was treated with microneedling alone. Patients were advised to use topical antibiotics (fusidic acid cream for seven days) and sunscreen for one week. For

microneedling dermaroller of 1.5mm needle length and 192 needles was used and PRP was prepared by double spin technique. Treatment was repeated at monthly interval for three months. Final assessment was done one month after last sitting. Final assessment was done using physician satisfaction score and Goodman and Baron acne scar grading one month after last sitting. Both Pre and post treatment photographs of both side of face were taken.

RESULT

A total of 34 patients enrolled out of which 2 were dropped out 32 patients had completed all sitting of treatment. Out of 32 patients 20 were male and 12 were female. Male: Female ratio was 1: 0.6 and mean age was 24.62 ± 3.38 years. 21 (66%) patients were in 18-25 year age group and 23 (72%) were married and 20 (62%) patients were having positive family history.

Table 1: Goodman and Baron Scar Grade

Scar Grade	Before treatment		After treatment	
	Rt	Lt	Rt side	Lt side
1	0	0	0	0
2	9	9	24	20
3	23	23	8	12
4	0	0	0	0

Rt- Right side, Lt-Left side, Rt side- Right side (Microneedling + PRP), Lt side-Left side (Microneedling alone)

Baseline mean scar grade by Goodman and Baron qualitative scar grade assessment was 2.72 ± 0.45 on both side of face. At the time final assessment mean scar grade on right side of face (microneedling + PRP) was 2.2 ± 0.4 and on left side of face (microneedling alone) was 2.37 ± 0.5 .

By using unpaired t test two tailed p value is 0.1382. So there is no statistically significant difference in response to either combined treatment with microneedling with PRP or microneedling alone by objective assessment by Goodman and Baron acne scar grading.

Table 2: Physician satisfaction score

Score	Response to treatment	Rt side	Lt side
0	NI	0	0
1	MI	8	12
2	GI	11	11
3	VGI	13	9
4	EI	0	0

NI- No improvement, MI- Mild improvement, GI- Good improvement, VGI- Very good improvement, EI- Excellent

improvement, Rt side- Right side (Microneedling + PRP), Lt side -Left side(Microneedling alone)

Chart 1: Physician satisfaction score

At the time of final assessment mean physician satisfaction score on right side of face (microneedling + PRP) was 2.16 ± 0.79 and on left side of face (microneedling alone) was 1.91 ± 0.8 . By using unpaired t test two tailed p value is 0.2421. So there is no statistically significant difference in response to either combined treatment with microneedling with PRP or microneedling alone by physician satisfaction score.

Side effects like erythema, edema and hyperpigmentation were seen equally on both side of face.

DISCUSSION

Acne by definition is a multifactorial chronic inflammatory disease of pilosebaceous unit, clinically characterized by the presence of comedones, inflammatory papules, pustules and sometimes nodules and cysts. It commonly occurs during adolescence and cause great psychological stress. [5,6] Unfortunately, acne scarring is common and occurs easily in the course of the disease. It is one of the most common causes of facial scarring and treating acne scar is one of the most challenging cosmetic procedures.^[7]

Treatment of acne scars requires multiple approaches. With the advent of microneedling and PRP therapy for atrophic scars, new avenues for treatment of acne scars can be explored. Microneedling, which is done using dermaroller, is an efficacious procedure with fewer side effects. This procedure, in addition to collagen induction, creates minute inlets for effective absorption of topical agents.[4] PRP serves as rich source of autologous growth factors, especially epidermal growth factor, platelet-derived growth factor, transforming growth factor beta, and vascular endothelial growth factor, that act in coherence with growth factors induced by skin needling, to enhance the wound-healing response.^[8,9]

In a systematic review, Hesseler and Shyam [10] concluded that adding platelet-rich plasma in the treatment regime significantly improved acne scars, increased patient satisfaction, and reduced post procedure downtime. Ibrahim MK, Ibrahim SM and Salem AM[11] concluded that the treatment of acne scars was satisfactory, whether using combined microneedling and PRP or microneedling alone. However, Gabriella Fabbrocini, Valerio De Vita, Francesco Pastore, Luigia Panariello, Nunzio Fardella, Rossana Sepulveres, Elio D'Agostino, Norma Cameli and Antonella Tosti (2011, p.177)[4] El-Domyati, M., Abdel-Wahab, H. and Hossam, A. (2018, p.73) [12], Porwal S, Chahar YS, Singh PK. (2018, p.403) [13], and Simran C. (2014, p.209) [14] found that outcome of acne scar treatment with the combination of "dermaroller and PRP" produced better results than "dermaroller alone".

CONCLUSION

Microneedling provided good results, and the addition of PRP enhanced the outcome in patients with atrophic acne scars.

REFERENCES

- Jacob CI, Dover JS, Kaminer MS. (2001) Acne scarring: a classification system and review of treatment options. *J Am Acad Dermatol*. 45: 109–17.
- Goodman's GJ, Baron JA. (2006) Postacne scarring: a quantitative global scarring grading system. *J Cosmet Dermatol*. 5: 48–52.

- Majid I. (2009) Microneedling therapy in atrophic facial scars: an objective assessment. *J Cutan Aesthet Surg*; 2: 26–30.
- Gabriella Fabbrocini, Valerio De Vita, Francesco Pastore, Luigia Panariello, Nunzio Fardella, Rossana Sepulveres, Elio D'Agostino, Norma Cameli and Antonella Tosti (2011) Combined use of skin needling and platelet-rich plasma in acne scarring treatment. *Cosmet Dermatol*. 24: 177–83.
- Gollnick H, Cunliffe W, Berson D, Dreno B, Finlay A, Leyden JJ. (2003) Global Alliance to Improve Outcomes in Acne. Management of acne: A Report from a Global Alliance to Improve outcomes in Acne. *J Am Acad Dermatol*. 49(Suppl):S1-37.
- Holland DB, Jeremy AH, Roberts SG, Seukeran DC, Layton AM, Cunliffe WJ. (2004) Inflammation in acne scarring: A comparison of the responses in lesions from patients prone and not prone to scar. *Br J Dermatol*. 150:72-81.
- Khunger N; IADVL Task Force. (2008) Standard guidelines of care for acne surgery. *Indian J Dermatol Venereol Leprol*. 74(Suppl):S28-36
- Everts PA, Jakimowicz JJ, van Beek M, Schönberger JP, Devilee RJ, Overdevest EP, et al. (2007) Reviewing the structural features of autologous platelet-leukocyte gel and suggestions for use in surgery. *Eur Surg Res*. 39:199-207.
- Hom DB, Linzie BM, Huang TC. (2007) The healing effects of autologous platelet gel on acute human skin wounds. *Arch Facial Plast Surg*. 9:174-83.
- Hesseler MJ, Shyam N. (2019) Platelet-rich plasma and its utility in the treatment of acne scars: a systematic review. *J Am Acad Dermatol*. 80(6):1730-1745.
- Ibrahim MK, Ibrahim SM, Salem AM. (2018) Skin microneedling plus platelet-rich plasma versus skin microneedling alone in the treatment of atrophic post acne scars: a split face comparative study. *J Dermatolog Treat*. 29(3):281-286.
- El-Domyati, M., Abdel-Wahab, H. and Hossam, A. (2018) Microneedling combined with platelet-rich plasma or trichloroacetic acid peeling for management of acne scarring: A split-face clinical and histologic comparison. *J Cosmet Dermatol*. 17(1), 73-83.
- Porwal S, Chahar YS, Singh PK. (2018) A comparative study of combined dermaroller and PRP versus dermaroller alone in acne scars. *Indian J. of Dermatol*. 63(5): 403-408.
- Simran C. (2014) Split face comparative study of microneedling with PRP versus microneedling alone in treating atrophic acne scars. *J. Cutan. Aesthet. Surg*. 7(4): 209-12.