

Comparative study of dermaroller versus trichloroacetic acid peel on atrophic acne scar patients.

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Abstract:

Objective - To compare the efficacy of derma roller versus TCA CROSS technique for the treatment of acne scars in tertiary care hospital.

Methods – This was a hospital – based, non interventional, cross- sectional study carried out over a period of 3 months on 60 patients with post acne scarring. Group 1 patients underwent four sessions of dermaroller therapy four weeks apart. Group 2 were treated with four sessions of TCA CROSS technique four week apart.

Results – Out of 60 patients in the study, 32 were male and 25 were females. Male patients had more severe acne vulgaris as compared to female ($p=0.0001$). Morphologically, majority of post acne scars were rolling in both the groups 75.86% in dermaroller group and 67.85% in TCA CROSS group. After four sessions of Dermaroller and TCA CROSS each, very good improvement was seen in 41.32 % patients in the dermaroller group and in 14.28% patients in tca group. Good improvement was seen in 51.72% in dermaroller group and 67.85% in tca group and no improvement was seen in 6.89 % in dermaroller group and 17.85 % in tca group. Side effects were mild and infrequent in both groups.

Conclusion – Both treatments are equally effective and safe for the treatment of acne scars.

INTRODUCTION-

Acne vulgaris is a chronic inflammatory disorder, which occurs due to accumulation of desquamated keratinocytes within pilosebaceous unit forming a microcomedone, which leads to localized inflammation and scarring (1). Acne leads to significant morbidity which is associated with residual scarring and psychological disturbances like poor self-image, depression, and anxiety, which further causes a negative impact on quality of life(2). Scar appears as a result of skin damage during the process of the skin healing. The pathogenesis of acne scars involves injury to the skin, which leads to a cascade of wound healing process. The wound healing event progresses through 3 stages: (a) Inflammation, (b) Granulation tissue formation, and (c) Matrix remodeling (3,4) The magnitude of inflammation and tissue damage decides the size and depth of the scars and therefore its mode of treatment(5,6).

Microneedling is relatively a new and minimally invasive procedure involving superficial and controlled puncturing of the skin by rolling with miniature fine needles. The standard medical dermaroller is a hand-held instrument which has 12 cm long handle with a 2×2 cm wide drum-shaped cylinder studded with 8 rows at one end and 24 circular arrays of 192 fine microneedles, usually 0.5–3 mm in length and 0.1–0.25 mm in diameter(7). In TCA CROSS focal application of 35% TCA concentration is done by pressing hard on the entire depressed area of scar using a sharpened applicator. (8)

Method

This study was conducted in Department of Dermatology. It is an observational type of study.

60 Patients presenting and fulfilling inclusion and exclusion criteria were enrolled and randomly assigned for the above study. Selected patients had been informed the nature of the study and written consent was obtained from the patients and prior approval of hospital ethical committee was taken for the study. Clinical photographs of the lesion were taken before commencement of therapy and after completion of therapy .The patients were grouped into 2 groups, who fulfill the inclusion criteria and were selected randomly and grouped half in each group. **GROUP 1** Dermaroller and **GROUP 2** Trichloroacetic acid. Patients underwent three sittings in each group, and were followed up every month for a period of 3 months and then final grading of the scar was done.

In group 1 patients, After cleansing the area to be treated, local anesthetic is applied and left for 45min - 1hour. Then a sterile rolling device with 192 needles of length 1.5 mm was rolled to and fro 6–10 times in four directions;

horizontally, vertically, and diagonally right and left, to cover an area of roughly 2×2 inches. This ensures an even pricking pattern, resulting in about 250–300 pricks/cm². It was rolled until uniform pin point bleeding is seen. In group 2 patients, 50 % TCA prepared freshly by adding equal volume of distilled water with 100% TCA. 50% TCA was applied deep to the base of the scars using sharp end of the wooden toothpick stick. Frosting appear due to coagulation of proteins is taken at the end point. TCA CROSS site is covered with saline soaked gauze for 2 minutes. Strict sun protection was advised and the adverse effects were noted in both the groups.

Results

Table 1 shows demographic data of study population. In our study, most of the patients that is 30(52.63%) were between 21-25 years of age, 16(28.07%) were between 26-30 years and 5 (8.72%) patients were between 31-35 years of age and 9(15.78%) patients were <20 years. In our study, male outnumbered female in number.

After three sessions of dermaroller and TCA CROSS, good improvement was seen in 51.72% patients in the dermaroller group (Figure 1a and 1b) and in 67.85% patients in the TCA group (Figure 2, 2a and 2b). Very good improvement was seen in 41.37% and 14.28% patients in dermaroller and TCA groups, respectively (Table 2) and no improvement was noticed in 6.89% and 17.85% patients in dermaroller and TCA group respectively.

Milder side effects seen in group I patients were, erythema 22(38.59%) and 7(12.28%) in dermaroller and tca group, postinflammatory hyperpigmentation were seen in 9(15.78%) and 11(19.29%) in dermaroller and tca group and acne aggravation in 6(10.52%) and 4(7.01%) in dermaroller and tca group. It was also seen that in dermaroller group, good response was seen in rolling and boxcar scars whereas in the TCA CROSS group, good response was seen in patients with ice-pick scars.

The difference in the degree of improvement between the two groups was not statistically significant. However, the satisfaction rate was better in the patients treated with dermaroller technique. Therefore, we can say dermaroller was more

Discussion

Acne scarring is a very unfortunate sequelae of acne and is a permanent complication of acne vulgaris, It affects almost 95% of patients (9). It may be associated with physical and psychological stress, particularly in young adults and results in low self-esteem and diminished quality of life(10). Majority of the patients (85%) with acne scars have loss of collagen tissue (atrophic scars), whereas minority of them shows hypertrophic scars and keloids(11).

We conducted a study on 60 patients who presented to outpatient department with acne scars. In our study, out of 60 patients 75% of patients were in age group between 21-30 years with mean age of 23 years. In a study conducted by Sheraz et al (12), majority of the patients, 51.94% fell within the age group of 31 - 40 years with the mean age of 32 +/- 4.49 years and in Waqas et al (13), studying efficacy of microneedling with dermaroller alternating with CROSS peeling with 30 % TCA has mean age of 24.5 +/- 4 years.

Gender

In our study, overall male predominance (60%) was seen in both groups. In group 1, 63 % of them were male and 37 % of them were female. In group 2, 57% of them were male and 43% were female. Similarly, this male predominance was also seen in Sheraz et al (12) study, which showed 58.44% males and 41.55% female and in Waqas et al (13) which also showed male predominance, 55% male and 45% are female. Whereas in our study male predominance was seen because male patients has more severe acne vulgaris, which progressed to acne scarring formation as also recorded by Kilkenny et al. (14)

Morphology

In our study predominant scar morphology in group 1 and 2 was rolling scar with 75.86% and 67.65% followed by boxcar scar with 62.06% in group 1 and 64.20% in group 2 followed by icepick scar with 43.37 % in group 1 and 35.71 % in group 2. Whereas similar to our study, In waqas et al (13), rolling scar was also present in 95% and both icepick and boxcar scars were present in 60% of the patients.

Thappa et al (15) also reported ice pick scar as the most common type of acne scar in 65.7% patients

Grading

In our study, in group 1 out of 30 patients, 16.6% belonged to grade 2, 46.6% belonged to grade 3 and 36.6% to grade 4 before treatment. Similarly in group 2, 20% belonged to grade 2, 46.6% belonged to grade 3 and 26.6% belonged to grade 4. Whereas in Nadia Waqas (13) et al, majority participants that is 80 % patient belong to grade 4 and 20 % patient belong to grade 3 before treatment.

Improvement

In our study, out of 60 patients, 51.72 % showed good improvement in the grading of scars in group 1. It means that they improved by 30 -49% reduction in scar with the treatment. In group 2, 67.85 % showed good improvement. Whereas in Sheraz et al, moderate improvement was seen in 40 % patient in dermaroller group and 26.6% patients in peel group.

In our study, very good response was seen in 41.32 % of the patient in group 1 . These patients showed improvement by 50-70% reduction in scar. In group 2, 14.28 % showed very good response. Whereas In Waqas et al (82) , out of 4 patients who were initially having grade 3 , all that is 100 % were improved to grade two .

In waqas et al (82) , the improvement was observed more in the acne scars having grade four at the baseline as one compared to grade three. Whereas In puri et al , marked improvement was seen in 40% patients in dermaroller group and in 60% patients in CROSS group . Moderate improvement was seen in 40% and 26.7% patients in dermaroller and CROSS groups. Mild improvement was noticed in 20% and 13.3 % patients.

Satisfaction

In our study , about 10.5 % patients had an excellent satisfaction score at the end of follow up period, whereas 35.5% of patients had very good satisfaction , 43.7 % have good satisfaction score and no patient reported poor satisfaction

Conclusion

scarring is an unfortunate complication of acne vulgaris. Early and aggressive treatment is vital to minimize if not prevent its occurrence. Overall maximum improvement in acne scarring is more in dermaroller group as compared to TCA group. On subjective evaluations, maximum patient satisfaction is found with dermaroller as compare to TCA peel. Therefore, surgical treatment showed better improvement compared with chemical treatment

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