

Outcome of CROSS technique with 100% trichloroacetic acid in the management of atrophic icepick acne scars

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Abstract *Objective* To assess the outcome of CROSS technique with 100% trichloroacetic acid (TCA) on atrophic icepick acne scars.

Methods It was a quasi-experimental study held at dermatology department, Sir Ganga Ram Hospital, Lahore on 20th November 2013 till 19th April 2014. A total number of 60 patients were included in this study. There were 40 female (66.7%) patients and 20 male (33.3%) patients. After informed consent, four sessions of 100% TCA focal application on atrophic icepick acne scars by CROSS (chemical reconstruction of skin scars) technique were done at two weekly intervals and final outcome was assessed at three months after the last session.

Results In our study 41.7% patients showed excellent (>70% reduction of acne scars) response, 45% patients showed good (51-70% reduction of acne scars) response, 13.3% patients showed fair (30-50% reduction) response and no patient showed poor (<30% reduction) response.

Conclusion Chemical reconstruction of skin scars (CROSS) technique with 100% TCA is a safe, minimally invasive and cost-effective technique for the treatment of icepick acne scars .

Key words

Outcome, CROSS technique with 100% Trichloroacetic acid, atrophic icepick acne scars.

Introduction

Acne is not a serious disease but it has a nuisance value out of all proportion to its seriousness, affecting, as it does, young people at an age when they are most sensitive to any facial disfigurement.¹ Acne scarring is one of the most dreaded and long lasting outcome of inflammatory lesions.² Although early treatment of acne lesions and inflammation with isotretinoin is beneficial in preventing acne scarring but still many patients present with

atrophic acne scars.³ Based on shape and depth acne scars can be classified into icepick scars, boxcars and rolling scars.⁴ Among atrophic acne scars, the icepick type scars represent 60-70% of total scars and they are shape like a V.⁴ Chemical peeling is a widely used procedure in the management of acne and acne scars, but there are very few studies on Asian populations who are more prone to develop hyperpigmentation.⁵ Trichloroacetic acid (TCA) peel is an effective and inexpensive peeling agent that can be focally applied on atrophic icepick acne scars as it causes coagulation of epidermal and dermal proteins, and necrosis of collagen up to the upper reticular dermis.⁶ In a study conducted by Lee *et al.*⁶ high concentration of TCA (100%) was applied on

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icepick acne scars showing that healing occurred more rapidly and with fewer complications. So this study was conducted to find out the outcome of 100% TCA in icepick acne scars and if proved effective it can be a useful addition to the therapeutic options in the treatment of icepick acne scars in our population.

Methods

It was a quasi-experimental study conducted at the Department of Dermatology, Sir Ganga Ram Hospital, Lahore on 20th November 2013 till 19th May 2014. A total number of 60 patients, with age ranging from 16-35 years were included in the study. There were 40 female (66.7%) patients and 20 male (33.3%) patients. The study data were approved by ethical committee of Fatima Jinnah Medical University and an informed consent was taken from all the patients. Data were collected on a predesigned proforma. Patients with moderate to severe atrophic icepick acne scars were included. Patients with mild (less than 26) atrophic icepick acne scars and those with keloidal tendency were not included. Exclusion criteria also include patients who were on isotretinoin therapy, patients with infections such as herpes labialis and critically ill patients. All patients were initially primed for two weeks with tretinoin 0.025% cream applied at night and a sunscreen before starting the 100% trichloroacetic acid CROSS technique. The patients were clinically assessed by scar counting by using surgical pen and digital photographs were also taken before first session and at three months after the fourth session. Local anesthetics or sedation were not used. 100% trichloroacetic acid was then focally applied very carefully on the depressed atrophic icepick acne scar using a toothpick, taking care to avoid spillage to the surrounding skin. The skin was carefully monitored until a refrigerator frosted appearance seen after a single

application. After the procedure, face was washed with plain water and sunscreen applied. One week after the peel 2% hydroquinone cream was introduced in all patients at night in order to reduce postinflammatory hyperpigmentation. The procedure was repeated every two weeks for four sittings. Outcome was assessed at the three months after the last session by again counting the scars and the response was categorized as excellent if more than 70% reduction of scars observed, good if 51-70% reduction of scars, fair if 30-50% reduction of scars and poor if less than 30% reduction of scars.

Patients were also inquired and examined for any expected side effects like postinflammatory hyperpigmentation and keloid formation. Data were analyzed by computer software SPSS version 20 and test applied was chi-square. Age was presented as mean± standard deviation. Gender and outcome (excellent to good response) was presented as frequency and percentage.

Results

In our study, 60 patients were enrolled. Of these, 40 patients (66.7%) were female and 20 patients (33.3%) were male (**Table 1**). The mean age distribution was 22.1±4.66 years. In our study 36 (60%) patients had moderate (26-50) icepick acne scars, and 24 (40%) patients had severe (more than 50) scars. In our study, 25 (41.7%) patients showed excellent (>70% reduction of acne scars) response, 27 (45%) patients showed good (51-70% reduction of acne scars) response, 8 (13.3%) patients showed fair (30-50% reduction of acne scars) response and no patient showed poor (<30% reduction) response (**Table 2** and **Figure 1**). Few patients had transient postinflammatory hyperpigmentation for which 2% hydroquinone was applied at night.

Table 1 Demographic data (n=60).

Gender	N	%	Age (years) (Mean±SD)
Male	20	33.3	21.5±4.39
Female	40	66.7	22.4±4.81
Total	60	100	22.1±4.66

Table 2 Results of trichloroacetic acid peel CROSS technique at three months after the last session.

Grades of Response	No. of patients (n=60)	Percentage
Excellent (>70%)	25	41.7
Good (51-70%)	27	45
Fair (30-50%)	8	13.3
Poor (>30%)	0	0

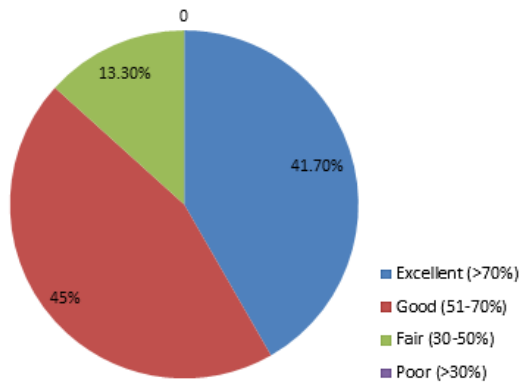


Figure 1 Percentage response at three months after last session

Discussion

Acne affects up to 80% of the adolescent population to some degree or another and post-acne scarring is one of its important complications.⁷ Treatment of post-acne scars is still a therapeutic challenge. A combination of various techniques like subcision, dermabrasion, punch grafting, chemical peels and laser resurfacing procedures are used to treat atrophic acne scars but with variable results.⁸ The icepick acne scars are deeper V-shaped scars and the techniques like dermabrasion and resurfacing lasers are unable to reach the depth of these types of scars.⁹ Trichloroacetic acid peel is an effective peeling agent for atrophic icepick acne scars and can be used either as a superficial, medium-depth or deep-peel depending on the

concentration used.⁶ Lee *et al.*⁶ has shown superior results with 100% TCA when compared to 65% TCA, without significant complications. In their study, 27 of 33 (82%) patients (the 65% TCA group) and 30 out of 32 (94%) patients (the 100% TCA group) experienced a good clinical response.⁶ All patients in the 100% TCA group who received six courses of treatment showed excellent (>70% reduction of acne scars) response.⁶ It is a self-neutralizing peel, therefore, it is not absorbed systemically even if high concentrations are used.⁵ A study conducted by Yug *et al.*¹⁰ showed that after application of TCA on acne scars, there is an increase in dermal volume as a result of an increase in collagen production, glycosaminoglycan, elastin fragmentation and dermal collagen remodeling that may continue for several months, and thus leading to clinical as well as histologic improvement and appearance of scars.¹⁰ In our study further sessions of TCA peel must be done in patients who have fair response, in order to achieve further reduction of icepick acne scars.

Another study conducted by Khunger *et al.*⁹, 100% TCA was applied focally by CROSS technique on icepick acne scars at two weekly intervals for four sessions. Excellent improvement (>70%) was observed in majority of patients (73.3%), while 20% patients showed good improvement (50-70%) and 6.7% patients had fair results (30-49%) at the end of four sessions. In our study excellent (>70%) response was seen in 41.7% patients and good (51-70%) response was seen in 45% patients. Our results are not comparable to the study conducted by Khunger *et al.*⁹ as we have excluded patients with mild (1-25) atrophic icepick acne scars which otherwise would have affect the results of our study.

Conclusion

Focal application of 100% trichloroacetic acid by CROSS technique is effective for the treatment of atrophic icepick acne scars, which do not respond well to other treatment modalities. Besides, the CROSS technique is also a highly economic option when compared to the lasers.

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