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Original Article

Comparative study of 40% hydrogen peroxide and 50% trichloroacetic acid in the treatment of seborrheic keratoses

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Abstract

Background Seborrheic keratosis (SK) is a common benign skin lesion, ranging from light tan to dark brown. Common techniques for SKs removal involve cryosurgery, electrosurgery, curettage, surgical excision, and chemicals like TCA. Recently FDA has approved hydrogen peroxide 40% for the treatment of SKs. However, there is a lack of clinical studies evaluating the efficacy and complication rates of these procedures, so we have taken up the study.

Aims and Objectives To study and compare the effectiveness of 40% hydrogen peroxide (HP) and 50% trichloroacetic acid (TCA) in the treatment of seborrheic keratoses.

Methods The study was conducted in our department of Dermatology at Dr. PSIMS & RF for a period of 6 months from March to August 2019. The sample size included 40 patients, and after taking informed consent, the study population was divided into two groups by systematic random sampling. One group was treated with 40% H_2O_2, and the other group with 50% TCA. After the first session, SKs with a Physician's Lesion Assessment (PLA) scale higher than 0 were treated for a maximum of three sessions at two weeks interval and followed up for one month after the last session.

Results After completion of all sessions, patients treated with hydrogen peroxide achieved a PLA scale of 0 (total clearance) in 45%, whereas in TCA, it was 25%, with significant p-value (<0.0001).

Conclusion Thus 40% H_2O_2 provides a novel, standardized, easily available, and non-invasive, method to treat SKs that is convenient to patients when compared to 50% TCA.

Key words
Seborrheic keratosis, hydrogen peroxide 40%, trichloroacetic acid 50%.

Introduction

Seborrheic keratosis (SK) is a common lesion, usually round or oval, ranging from light tan to dark brown. The term seborrheic refers to the lesions that are rough or waxy in appearance. There is no exact cause for SK; however, the lesions frequently appear on areas of the body that are exposed to the sun.[1] SK are also found in intertriginous areas, such as the abdominal folds or axillae, and sunlight cannot be implicated in every instance. Other potential causes include viruses and genetic mutations.[1]

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SK lesions are distributed equally among both men and women, although a recent survey of patients with SK found a slightly higher rate among men.[2] SK is more prevalent in Caucasians, but a variant form known as dermatosis papulosa nigra can affect people having Fitzpatrick skin type VI.[3,4]

Patients with SK have wide ranges of motivations for being treated, including embarrassment from the unsightly nature of the lesion, physical irritation or pruritus, and a desire to have a better appearance.[2]

Common techniques for SK removal involve cryosurgery, electrosurgery, curettage, or surgical excision.[5] There is, however, a notable lack of well-controlled clinical studies evaluating the efficacy and complication rates of these procedures.

Thus, there is a significant and unmet need for a safe, effective, non-invasive, and cosmetically acceptable treatment for this common condition.

Preliminary evidence shows promise for an agent. Hydrogen peroxide topical solution 40% (ESKATA), is a proprietary formulation of a stabilized, high-concentration hydrogen peroxide (HP) solution, and it is the first and only US Food and drug administration approved topical treatment for raised SK. HP40 acts through direct oxidation of organic tissues, generation of reactive oxygen species, local lipid peroxidation, and generation of local concentrations of oxygen that are toxic to SK cells.[6-8] Based on this, we have taken freshly prepared hydrogen peroxide to study its effect on Sk.

Besides, 50% of trichloroaceticacid[9] also showed significant improvement in SK.

However, only a handful of studies have been done, and significant data is lacking, so this study has been taken up.

Aims and Objectives

To study and compare the effectiveness of hydrogen peroxide 40% and 50% trichloroacetic acid in the treatment of seborrheic keratoses.

Methods

The present study was done in the department of dermatology at Dr. PSIMS & RF, for a period of 6 months from March 2019 to August 2019. It is a prospective open-labeled study, comprising of 40 patients with SK.

Inclusion criteria All clinically diagnosed cases of seborrheic keratosis.

Exclusion criteria Patients with:

1. SK over eyelids and within 5mm of the orbital margin.
2. Hypertrophic scarring or keloid formation tendency in the patient.
3. Infection at the site of application.
4. Pregnant or Lactating women.

All the patients who met the fixed criteria were taken into the study and were explained about the procedure of hydrogen peroxide or TCA application, duration of the therapy, possible outcomes of the treatment, associated possible complications, and expected duration to get optimum results. After complete counselling of the patient in their own understandable language, written informed consent was taken, and the study population was divided into two groups by systematic random sampling. One group was treated with hydrogen peroxide and the other group with TCA.

Firstly the SK were cleaned with spirit, and then 40% H_2O_2 was applied with firm pressure for 20

seconds in a circular motion using a toothpick applicator. This procedure was done in a similar fashion, as explained above, four times with a time gap of 60 seconds. The formation of white layer over lesions was noticed, as shown in figure 1 & 2, and the patient was monitored for 20 min after treatment. In a similar way, after cleaning the SK with spirit, petroleum jelly was applied over the surrounding area, and 50% TCA was applied only once using toothpick applicator. After the formation of white frost over the lesion, as seen in figure 3 & 4, it was neutralized, and the patient was monitored for 20 min.

At each visit, SK were graded using the Physician's Lesion Assessment (PLA) scale (0, clear; 1, nearly clear; 2, <1 mm thick; and 3, >1 mm thick. After the first session, SK with a PLA scale higher than 0 were treated for a maximum of three sessions at two weeks interval and followed up for one month after the last session. Clinical photographs were taken at each session and 1 month after cessation of therapy.

Results

Forty patients have completed our study, among which 21 were males, and 19 were females, and most of them were in the age group of 60 – 80 years. Statistically, no significant p-value was observed using the chi-square test among the age group and gender.

Table 1 Age and gender distribution.

Age range	*Males*	*Females*	*Total*	*P-value*
40 - 60	8	11	19	
60 - 80	13	8	21	
Total	21	19	40	<0.34

Table 2 Patients treated with 40% HP.

PLA scale	*Sitting number*			
	1st	*2nd*	*3rd*	*after 1 month*
>3	8	3	1	0 (0%)
>2	6	6	7	3 (15%)
>1	6	5	5	8 (40%)
0	0	6	7	9 (45%)
Total	20	20	20	20 (100%)

Table 3 Patients treated with 50% TCA.

	Sitting number			
	1st	*2nd*	*3rd*	*after 1 month*
>3	6	2	2	0 (0%)
>2	9	11	9	8 (40%)
>1	5	6	5	7 (35%)
0	0	1	4	5 (25%)
Total	20	20	20	20(100%)

Table 4 Comparison between 40% Hydrogen peroxide and 50% TCA.

PLA scale after 1 month	*>3*	*>2*	*>1*	*0*	*P-Value*
40% H_2O_2	0	3	8	9(45%)	<0.0001
50% TCA	0	8	7	5(25%)	

Among 20 patients treated with 40% hydrogen peroxide, PLA scale 0 was achieved in 45% of patients **(Table 2)**.

Among 20 patients treated with 50% TCA, PLA scale 0 was achieved in 25% of patients **(Table 3)**.

After completion of all sessions, the patients treated with hydrogen peroxide achieved a PLA scale of 0 (total clearance) in 45%, whereas in TCA, it was 25%. Statistically, significant P-value(<0.0001) was observed using Spearman's Rank Correlation, and it implies that patients treated with 40% hydrogen peroxide had better results when compared to 50% TCA.

The side effects observed among patients with HP40 were erythema 12 (60%), scaling 7 (35%), and hypopigmentation 5 (25%), and whereas among patients with 50 % TCA were burning sensation (100%), erythema 18 (90%) and hyperpigmentation 7 (35%).

Discussion

Seborrheic keratoses particularly in areas of cosmetic concern such as the face, maybe aesthetically bothersome as well as medically worrisome to patients and may affect the quality of life.[2]

Figure 1 Before application of 40%H_2O_2.

Figure 2 Frosting after application of 40%H_2O_2.

Figure 3 Before application of 50% TCA.

Figure 4 Frosting after application of 50% TCA.

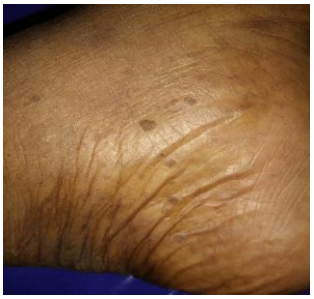

Figure 5 40% H_2O_2 application.

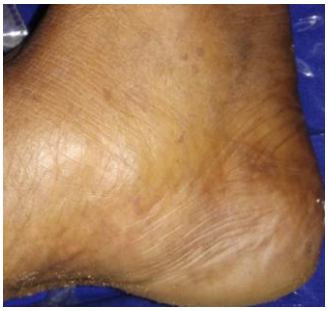

Figure 6 After completion of 1st sitting.

Figure 7 Before application of 50% TCA.

Figure 8 After completion of 1st sitting.

In our study, among 20 patients treated with HP40 after first sitting, PLA scale 0 was achieved in 6 (30%), whereas Leslie S. Baumann *et al.*[10] study showed PLA scale 0 in 25% patients.

After the end of therapy, PLA scale 0 and 1 were achieved in 85% of patients with HP40, whereas in a study done by Leslie S. Baumann *et al.*,[10] it was observed in 72% of patients and with TCA it was 60%.

Our study showed a good response with HP40, and it was similar to the study done by DuBois *et al.*[11]

Our study showed statistically significant improvement in patients with 40% hydrogen peroxide topical solution when compared with 50% TCA.

In our study, adverse effects were seen more in 50% TCA when compared to HP40, and adverse effects were limited to local skin reactions, which were mostly mild to moderate and self-limited. Most lesions had generally resolved by the end of the study.

In our study, limitations include the small number of study population, with Fitzpatrick skin types V or VI.

The current results demonstrate that HP40 is more effective in the treatment of SKs when compared to 50% TCA, with a low risk of inducing pigmentary changes and scarring.

Figure 9 40% H_2O_2 application.

Figure 10 After completion of 2nd sitting.

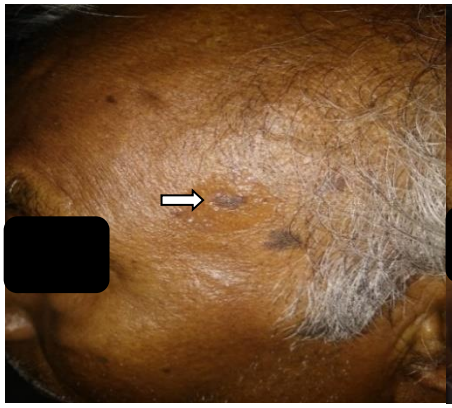

Figure 11 50% TCA application.

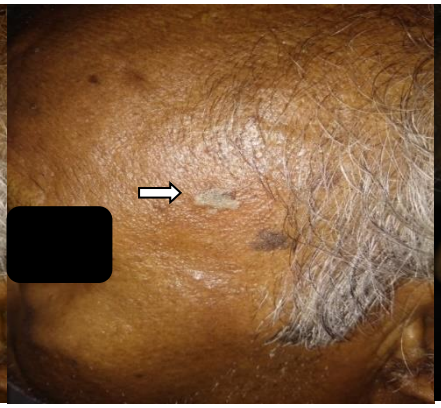

Figure 12 Frosting after application.

Figure 13 After 2nd sitting.

Conclusion

Thus hydrogen peroxide 40% provides a novel, standardized, easily available and non-invasive, method to treat SKs that is convenient to patients when compared to 50% TCA.

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