

EFFICACY OF TOPICAL TRICHLOROACETIC ACID AND HYDROGEN PEROXIDE FOR APHTHOUS ULCERS

Ahmed Muhammad Al-Abbasi

Department of Otorhinolaryngology, Basrah College of Medicine, Basrah, Iraq

ABSTRACT

Background: Aphthous ulceration is a common and painful problem. This study was conducted to evaluate the therapeutic effect of local application of trichloroacetic acid and hydrogen peroxide for aphthous ulcers minor.

Methodology: This was a double blind controlled study; conducted at Al-Mawanee and Basrah General Hospital. Patients with aphthous ulcers minor were enrolled in this study between January 2002 and December 2004. Forty four patients were enrolled in the study. They were divided blindly into 3 equal groups; 18 patients were managed with local application of 30% trichloroacetic acid, 18 by 6% hydrogen peroxide and 18 by normal saline (control group). All patients were followed after 3-7 days. Clinical assessment was performed depending on 3 criteria; tingling & pain, tenderness, and surrounding erythema.

Results: Fifty-four patients with aphthous ulcers minor were studied. Male to female ratio was 0.6:1. The commonest site of ulcers was labial and buccal mucosa in 14(25.9%) patients. Thirty-eight (70%) patients were non-smokers, there were 3 male patients and one female affected after giving up cigarette smoking. Nineteen (35%) patients went into remission. These included 13(72.2%) patients in trichloroacetic acid, whereas only 5(28%) in hydrogen peroxide and only one (5.5%) in control group.

Conclusion: Trichloroacetic acid 30% is a suitable agent in the treatment of aphthous ulcers minor. It would be of benefit particularly in resource-limited developing countries.

KEY WORDS: Aphthous ulcer, Trichloroacetic acid, Hydrogen peroxide.

INTRODUCTION

Aphthous ulcers are a common and painful problem. They can be classified into three different types: minor, major and herpetiform. Minor aphthae are generally located on labial or buccal mucosa, the soft palate and the floor of the mouth.² They can be singular or multiple, and tend to be small i.e. less than 1 cm in diameter and shallow.¹⁻³ Major aphthae are larger, involve deeper ulceration and are more likely to scar with healing.² Herpetiform aphthae are more numerous and vesicular in morphology.² Treatments include antibiotics, anti-inflammatories, immune modulators, anesthetics and alternative (herbal) remedies.

Aphthous ulcers that occur in conjunction with symptoms of uveitis, genital ulcerations, conjunctivitis, arthritis, fever or adenopathy should prompt a search for a serious etiology.¹ Aphthae more commonly affect young adults, and a familial tendency may exist.³ Paradoxically, smoking offers a somewhat protective effect against recurrent aphthae.² Other etiologic factors such as stress, physical or chemical trauma, food sensitivity and

infection have been proposed. Infectious agents such as *Helicobacter pylori* and *herpes simplex virus* have been investigated but not consistently found in aphthous ulcers.⁴ The lack of clarity regarding etiology has resulted in treatments that are largely empiric and aimed at symptom reduction.

The aim of the study was to evaluate the therapeutic effect of local application of trichloroacetic acid (TCA), and hydrogen peroxide (H₂O₂) for aphthous ulcers minor(AUM).

PATIENTS AND METHODS

This was a double blind controlled study, approved by the Ethical Committee of Basrah Medical College, conducted at Al-Mawanee and Basrah General Hospitals, in the period from January 2002 to December 2004. Fifty-four patients, 33 females and 21 males with aphthous ulcers minor (AUM) were enrolled in this study. More than this number of patients were seen but excluded because of patient refusal, single ulcer, viral infections, diabetes mellitus, allergic process, or those under treat-

Table 1: Characteristics of study patients.

Characteristics	Hydrogen Peroxide (n = 18)	Trichloroacetic Acid (n = 18)	Normal Saline (n = 18)
Gender (n+%)			
Females	10 (55.5)	12(66.6)	11 (61.2)
Males	8 (44.4)	6(33.3)	7 (38.8)
Age, years (mean \pm MSE)	21.6 \pm 2.2	28.0 \pm 3.1	32.2 \pm 2.4
Quantity of lesions	2.09 \pm 0.08	3.18 \pm 0.06	2.7 \pm 0.04
Size (mm²)	6.20 \pm 0.5	5.30 \pm 0.4	6.10 \pm 0.5
Symptoms (n+%)			
Erythema	18 (100.0)	17 (94.40)	17 (94.40)
Pain	18 (100.0)	18 (100.0)	18 (100.0)
Tenderness	16 (88.8)	18 (100.0)	18 (100.0)

ment with anti-infective mouthwashes or drugs that could influence healing of the ulcers. Pregnant or lactating females were also excluded from the study.

All the studied patients had more than one ulcer and of minor type, the history of onset of symptoms of ulceration should not exceed 2 days, patients were randomly divided into three equal groups, local application of trichloroacetic acid (30%) on one ulcer for one group, and for the other, hydrogen peroxide (6%) were applied and normal saline was applied for the control group.

30% TCA was prepared by adding water to 30 gm of TCA crystals until 100 ml of solution was reached, while 6%hydrogen peroxide (H₂O₂) and normal saline were available in market.

The tip of the stick with cotton was soaked in solution and gently touched to the ulcer, for about 10 seconds. Patients warned that the procedure may sting for a moment but, considering that they are already in pain, they don't really notice much difference.

All the patients were seen 3-7 days after the local treatment for evaluation, and this is done by comparison of treated ulcers with the nearby ulcer, the parameters for comparison were : erythema, tingling and pain, and tenderness, we considered improvement, if two of these parameters were significantly decreased or abolished.

RESULTS

This study included 54 patients with AUM, 33 females and 21 males, with a male to female

ratio of 0.6: 1. The age of the patients ranged from 5 to 58 years, majority belonged to the third decade. All had a previous history of recurrent oral ulcers, and all of them came with more than one ulcer, with size less than 1 cm. (Table-1)

Pain, erythema, and tenderness was found in nearly all of the studied patients. (Table 1) The median follow-up evaluation time was 5 days, ranging from 3 to 7 days.

The lesions went into remission in 19 out of 54 (35%) patients. Thirteen patients out of 18 (72.2%) treated by TCA went into remission, which was statistically significant but only 5 out of 18 (28%) patients treated by H₂O₂ went into remission while only one patient (5.5%) in control group went into remission.

The treatment was well tolerated with minimal side effects. All patients in non-control groups experienced a tolerable burning sensation locally, but only one patient needed an oral analgesic for symptom relief.

DISCUSSION

Several published investigations have proved that TCA can damage HPV DNA to a certain degree at different concentrations.⁵⁻⁷ However no report has been published to date regarding its therapeutic effect in treating AUM. We demonstrated good results using topical 30% TCA in treating AUM, with minimal side effects. Although its effect in the treatment of AUM was modest in our results, 30% TCA seemed to have the ability to shorten the duration of the ulcers.

The severity of the burn is related to a number of factors, including, the concentration of agent, the length of contact time, the volume and the physical form of the agent,⁸ It is also used for treatment of acute otitis externa,⁹ as herbicide, and antiseptic.¹⁰

H₂O₂ is pale blue liquid which appears colorless in a dilute solution, slightly more viscous than water. It is a weak acid. It has strong oxidizing properties and is therefore a powerful bleaching agent that is mostly used for bleaching paper, but has also found use as disinfectant.¹¹ Delivering hydrogen peroxide into wounds kills fibroblasts and occludes local microvasculature.^{12,13}

We believe that it is unnecessary to treat AUM if the mode of treatment is potentially risky like steroid or immune modulators, but is reasonable and worthwhile to treat if the benefits of the treatment, such as non-invasiveness, low cost and easy application outweigh its disadvantages and this is applicable to TCA. Our results showed that the high efficiency 30% TCA fairly well matched its minimal side effects in treating AUM.

We demonstrated a new treatment without any major adverse effects using topical TCA. The success rate of topical treatment of TCA in our study might be increased by increasing the concentration of the agent since the depth of tissue damage is increased with the concentration of TCA.¹⁴

The drawback of this study was the short follow-up period; a long follow-up may enable us to throw light on recurrence.

CONCLUSION

Trichloroacetic acid 30% is a suitable agent in the treatment of aphthous ulcers minor. It offers the advantages of low cost, no secondary effects, and an easy application and handling. It would be of benefit for patients particularly in resource-limited developing countries.

Therapeutic effect of H₂O₂ needs further investigation including the use of different concentrations.

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Corresponding author:

Ahmed M. Al-Abbasi
 Assistant Prof. Otorhinolaryngology
 Basrah College of Medicine
 Basrah, Iraq
 E-mail: mmalabbasi@yahoo.com