

Comparison of Hydrogen Peroxide and Trichloroacetic Acid in Recurrent Oral Aphthous Ulceration Minor

SADDIQUE ASLAM, MUHAMMAD SAJID*, MUHAMMAD ASHRAF*, AKHTAR MUNEEER**, MUHAMMAD FAROOQ***

ABSTRACT

Objective: To compare the results of hydrogen peroxide and trichloroacetic acid in patients with recurrent oral aphthous ulceration of minor type.

Study design: Normative Comparison Study.

Setting: DHQ teaching Hospital and private clinics of the authors at Kohat.

Study period: January 2010 to December 2010.

Patients and methods: Clinically diagnosed 60 patients of recurrent Oral Aphthous ulceration of minor (ROAUM) were included in this study. Patients were distributed into Group A and B having 30 patients in each. Group A having patients treated with 5% hydrogen peroxide and group B of patients treated with 20% trichloroacetic acid (TCA). Both the drugs were used by topical application to all the patients. All the cases were thoroughly evaluated after 6-days of treatment. Reduced or abolished surrounding erythema, tenderness and tingling sensation were used as assessment criteria.

Results: Out of total 60 patients of recurrent oral aphthous ulceration minor (ROAUM), there were 15 males (25%) and 45 females (75%) with male to female ratio of 1:3. The age range was 15-50 years where mean age was 35 year. In group A, 26 patients (86.6%) got the relief from symptoms while in group B, only 7 patients (23.4%) went into relief. X² was applied to both groups. Chi-square value was 0.66 for which p value is 0.4155 representing non significant results. Presentation of surrounding erythema, tenderness and tingling sensation were found in almost all studied cases.

Conclusion: Hydrogen peroxide 5% is a safe, cost effective, easily applicable agent in the treatment of recurrent oral aphthous ulceration minor (ROAUM) type. It is beneficial for such patients in our country.

Key words: Hydrogen peroxide, Trichloroacetic acid, oral aphthous ulceration.

INTRODUCTION

Recurrent oral aphthous ulceration is a common painful oral condition especially of poor community patients. It can be typed as minor, major, and herpetiform. Minor type are usually located in the anterior part of the mouth where there is lining mucosa i.e., labial buccal, ventral surface of the tongue, and soft palate¹. It can present as single, multiple and even 100 in number and tends to be less than 1cm^{2,3}. Major types are located in the posterior part of the mouth, usually larger in size, causing difficulty in swallowing and are more likely to heal with scarring². While herpetiform type of recurrent oral aphthous ulceration are smaller in size, numerous and vesicular in morphology². The exact etiology of recurrent oral aphthous ulceration is not known, hence it is idiopathic, therefore for relief of

symptoms, anti-inflammatory, immune modulators, soothing agents, topical anesthetics and herbal remedies are prescribed². Behçet's syndrome and Reiter's disease are the close differential diagnosis of recurrent oral aphthous ulceration where eyes, joints and external genitalia are commonly involved. Such symptoms should click the clinician for serious etiology¹. Young adults are commonly affected by ROAUM and familial predilection may occur³. Contrarily, smoking provides soothing for ROAUM². Physical and chemical agents, stress, trauma, infection and sensitivity to certain foods are also the possible predisposing factors. Herpes simplex and Helicobacter pylori have been investigated as infectious agents in ROAUM are not commonly found⁴. Regarding etiology, ROAUM is still a dilemma, therefore treatment is given for symptomatic relief.

PATIENTS AND METHODS

This was a normative comparison study, approved by the institutional review board for bio-ethics (IRBB) of KUST institute of Medical sciences (KIMS) Kohat,

*Assistant Professor, Pharmacology Deptt. KIMS, Kohat

***Assistant Professor, Pathology Deptt. KIMS, Kohat

***Emergency Pathology Lab, SIMS/SHL, Lahore

Correspondence to: Dr Saddique Aslam khattak, Assistant Professor, KUM institute of medical sciences, Kohat. Email:drsaddique@hotmail.com

conducted at DHQ teaching Hospital KDA and private clinics of the authors at Kohat, Khyber pukhtunkhwa from January 2010 to December 2010. Patients were diagnosed on the basis of thorough history and clinical examination. Patients having more than one but less than five recurrent oral ulcers, size of each ulcer less than one centimeter square with surrounding erythema, tenderness and tingling sensation were included in the study. The history of symptoms onset was not more than three days. Pregnant females or lactating mothers and patients having single oral ulcer, viral infections, allergic process, Reiter's disease, behchets syndrome and diabetes mellitus were excluded. Patients were distributed into Group A and B having 30 patients in each. Group A having patients treated with 5% hydrogen peroxide and group B patients treated with 20% trichloroacetic acid (TCA). Both the drugs were applied topically twice a day with cotton pledged to all the patients. All the cases were thoroughly evaluated after 6-days of treatment. Reduced or abolished surrounding erythema, tenderness and tingling sensation were used as assessment criteria.

RESULTS

Out of total 60 patients of recurrent oral aphthous ulceration minor (ROAUM), there were 15 males (25%) and 45 females (75%) with male to female ratio of 1:3. The age range was 15-50 years where mean age was 35 year and most of the patients were from the third decade of life (Table I)

Table I: Demographics features of patients.

Demographic Characteristics	Group A	Group B
Males	9	6
Females	21	24
Total	30	30

History of previous ulceration was present in all cases. All the studied cases presented with more than one ulceration and the size of each ulceration was less than 1cm square. In group A the mean number of recurrent oral aphthous ulceration minor type was 4 from the 120 ulcerations, while in group B from 90 ulcerations the mean was 3. The mean size of recurrent oral aphthous ulceration was 7.3mm square group A and 6.2mm square in group B. Recurrent oral aphthous ulceration minor was 46 (76.6%) on labial and buccal mucosa and 14 (23.4%) on the ventral surface of the tongue in the total patients studied in both the groups. Surrounding erythema, tenderness and tingling sensation were found in almost all studied cases. Among 30 patients, in group A, 26(86.6%) got the relief from symptoms (surrounding erythema, tenderness and tingling

sensation decreased or abolished) and 7(23.3%) cases out of 30 in group B went into relief (Table 2).

Table 2: Results of relief of patients

Gender	Group A (Hydrogen per oxide treated)	Group B TCA treated*
Males	7	3
Females	19	4
Total	26	7

*TCA= Trichloroacetic acid

Overall 33(55%) patients from both the groups got symptoms relief.

DISCUSSION

Hydrogen peroxide 5% is a colorless dilute solution having very important qualities like antiseptic¹¹ disinfectant¹² and local haemostatic agent¹³. In our study, 26(86.6%) patients treated with 5% hydrogen peroxide got the relief from symptoms of recurrent oral aphthous ulceration minor type whereas in other study, 19(35%) cases went into remission⁸ for the reason not known. This study reveals that 5% hydrogen peroxide is more effective and safe when compared with 20% trichloroacetic acid where 7(23.3%) got the relief of symptoms in the treatment of recurrent oral aphthous ulceration of minor. Trichloroacetic acid can damage the DNA of human papiloma virus to some extent at various concentrations^{6,7}. Our results i.e. 7(23.3%) in treating recurrent oral aphthous by 20% trichloroacetic acid are less than i.e.,13(72.20%) as studied by others⁸ and the use of lower concentration of trichloroacetic acid in our study could be the reason. Trichloroacetic acid is a caustic agent may be dangerous for oral tissues when used in higher concentrations, increased length of contact time, and its increased volume^{9,10}. It is also used for the treatment of acute condition of the pinna of ear as herbicide and antiseptic¹⁰.

By using 5% hydrogen peroxide we have studied a new agent for the treatment of recurrent oral aphthous ulceration without any side effects. Since the depth of tissue damage is enhanced by increasing the concentration of hydrogen peroxide, the success rate may be improved. We think it is quite unnecessary to use potentially risky drugs like steroids. immunomodulators for the treatment of recurrent oral aphthous ulceration. Topical treatment by 5% hydrogen peroxide is noninvasive, cost effective and easily applicable; outweigh its disadvantages if any, hence it is reasonable to use it for treatment of recurrent oral ulceration. The short follow-up period was the drawback of our study. One can focus on the prevention of recurrence of recurrent oral aphthous ulceration when follow up is prolonged.

CONCLUSION

Hydrogen peroxide 5% is a safe, cost effective, easily applicable agent in the treatment of recurrent oral aphthous ulceration minor (ROAUM) type .It is beneficial for such patients in developing countries. Long term follow up studies may be helpful in future for the prevention of recurrent oral aphthous ulceration by using different concentrations of hydrogen peroxide and trichloroacetic acid.

REFERENCES

1. Linewear W, Howard R, Soucy DI. Topical antimicrobial toxicity. *Arch Surg* 1985; 120:267-270.
2. Cotran RS, Kumar V, Robbins SL. Robbins pathologic basis of disease. 4th ed. Philadelphia: Saunders, 1989:817.
3. Burgess JA, Johnson BD, Sommer E. Pharmacological management of recurrent oral mucosal ulceration. *Drugs* 1990; 39: 54-65.
4. Zhu WY, Blauvelt A, Goldstein BA, Leonardi C, Penneys NS. Detection with the polymerase chain reaction of HPV DNA in condylomata acuminata treated in vitro with liquid nitrogen, trichloroacetic acid, and podophyllin. *J Am Acad Dermatol* 1992; 26:710-4.
5. Brodland DG, Cullimore KC, Roenigk RK, Gibson LE. Depths of chemofoliation induced by various concentrations and application techniques of trichloroacetic acid in a porcine model. *J Dermatol Surg Oncol* 1989; 15:967-71.
6. Hao L, Eng-Yen H, Hung-Yaw C, Chan C, Chang C. Therapeutic effects of topical applications of Trichloroacetic acid for vaginal intraepithelial neoplasia hysterectomy. *Japanese journal of clinical oncology* 2005; 35:651-4.
7. Freeberg IM. Fitzpatrick's dermatology in general medicine. 5th ed. vol 1. New York, N.Y.: McGraw-Hill, 1999.
8. Abbasi AMA. Efficacy of topical trichloroacetic acid and hydrogen peroxide for aphthous ulcers. *GJMS* 2010; Vol 8 No 2, 105-107.
9. Chipman MS, Cimis RJ, Baughman. Lack of association between aphthous ulcers and Helicobacter pylori. *Arch Dermatol* 1998; 134:1634-5
10. Ilias Kantas, Dimitrios G, Balatsouras, et al. The use of trichloroacetic acid in the treatment of acute external otitis. *European Archives of Otorhinolaryngology* 2007; 1:9-14.
11. Drabowicz J. In: The syntheses of sulphones, sulfoxides and cyclic sulphides, p.112-116, G. Capozzi et al; John Wiley & sons, Chichester, UK, 1994.
12. Boothby RA, Carlson JA, Rubin M, Mogran M, Mikuta JJ. Single application treatment of human papillomavirus infection of the cervix and vagina with trichloroacetic acid: a randomized trial. *Obstet Gynecol* 1990; 76:278-80.
13. Nishio CE, Petri V, Narahashi E. Oral hairy leukoplakia (OHL): topical use of trichloroacetic acid and glycolic acid—results. *Int Conf AIDS* 1994 Aug 7-12; 10:182.
14. Malviya VK, Deppe G, Pluszczynski R, Boik G. Trichloroacetic acid in the treatment of human papillomavirus infection of the cervix without associated dysplasia. *Obstet Gynecol* 1987; 70:72-4.
15. Branemark PL, Ekholm R. Tissue injury caused by wound disinfection. *J bone joint Surg* 1967; 49:48-62.