

Evaluation of the efficacy of alum suspension in treatment of recurrent ulcerative ulceration.

Tagreed S. ALtaei B.Sc., M.Sc.⁽¹⁾

Raja H. Al-Jubouri B.D.S., M.Sc.⁽²⁾

ABSTRACT

Background: Recurrent aphthous ulceration or recurrent aphthous stomatitis is the most common oral mucosal disease known to human beings. Despite much clinical and research attention, the causes remain poorly understood, the ulcers are not preventable, and treatment is symptomatic. The most common presentation is minor recurrent aphthous stomatitis: recurrent, round, clearly defined, small, painful ulcers that heal in 10 to 14 days without scarring. Major recurrent aphthous ulcerative lesions are larger (greater than 5 mm), can last for 6 weeks or longer, and frequently scar. The third variety of recurrent aphthous stomatitis is herpetic ulcers, which present as multiple small clusters of pinpoint lesions that can coalesce to form large irregular ulcers and last 7 to 10 days. Diagnosis of all varieties is usually made after clinical examination. Alum Potassium aluminum sulfate, or ammonium aluminum sulfate, used especially as an emetic, an astringent, and a styptic.

Patients and Method: A sample of fifty two patients were included in this study. 28 female, 24 male, ages range 20-40 years. They all participated in a randomized double-blind placebo controlled study. Patients with RAU were separated in to 5 groups, and these were treated with 1, 3, 5, 7 % of alum suspension, and placebo, applied topically four times daily, for five days treatment. Patients response to treatment was determined by; clinical evaluation of subjective treatment response, duration of lesion healing.

Results: Statistical analysis of the effect on healing time of the three concentrations of the drug (3, 5, 7) had a significant reduction in the time required for complete healing of the ulcer compared with placebo group.

Conclusions: Alum shortened the duration of healing on RAU with lack of any side effects.

Keywords: Alum RAU, (J Coll Dentistry 2005; 17(2):45-48)

INTRODUCTION

Recurrent aphthous ulceration (RAU) is acute painful recurring mouth ulcers usually involving non keratinized oral mucosa.⁽¹⁾ It is the most common oral mucosal disease affecting humans and has been reported as affecting 20-25 % of the general population at any time.^(2,3)

The cause of RAU is incompletely understood but appears to involve immune system dysfunction.⁽⁴⁾ Analysis of the peripheral T lymphocytes in patients with aphthae shows a decreased ratio of T-helper (CD4+) cells to T-suppressor / cytotoxic (CD8+) cells. Evidence of the destruction of the oral mucosa mediated by these lymphocytes is strong, but the initiating cause is elusive.⁽³⁾

The causative factors of RAU are unknown but are probably multifactor, with precipitating systemic, local, microbial, and genetic factors all being implicated as follows:

Allergies, genetic predisposition, hematological abnormalities, hormonal influences, infectious agents, nutritional imbalances, trauma, stress, smoking cessation.⁽²⁻⁵⁾

Therapy for RAU includes; Topical antiseptic (Chlorhexidine gluconate mouth wash), topical analgesics (Benzylamine hydrochloride mouth wash), topical corticosteroids (Hydrocortisone, Triamcinolone, Betamethasone, Beclomethasone), topical antibiotic (Chlortetracycline mouth wash). The systemic therapy is Immunomodulators (Azathioprine, Colchicine, Cyclosporin, Thalidomide, and miscellaneous; (Cimetidine, Carbinolone, 5 amino-salicylic acid, Pentoxifylline, low energy laser, Livamisole).^(2,5-7)

The clinical features of RAU may be classified as minor, major, or herpetic. Minor aphthous ulcers are the most common type, with prevalence in the general population of 5-25% and clinically manifesting as small shallow ulcers (<5 mm diameter). Lasting approximately 7-10 days and recurring 2-3 times a year. Major ulcers are larger and deeper (>10mm) can last up to 6 weeks, and may lead to scarring. Herpetic ulcers are the least common, characterized by multiple recurrent crops of small painful ulcers of 1-3 mm in diameter and distributed through out the oral cavity.⁽⁸⁾

Alum; potash alum, potassium aluminum sulphate KAL (SO₄)₂.12H₂O. Its colorless, transparent, odorless, crystalline masses or granular powder with a sweetish astringent

(1) Assistant professor, Department of Basic Sciences, College of Dentistry. University of Baghdad.

(2) Assistant professor, Department of Oral Diagnosis, College of Dentistry. University of Baghdad.

taste. When heated it melts and at about 200° loses its water of crystallization with the formation of the anhydrous salt. It is soluble as 1 part in 7.5 parts of water, 1 in 0.3 of boiling water, and 1 in 3 of glycerol. A 10% solution in water has a pH of 3 to 3.5. A 6.35% solution is iso-osmotic with serum.⁽⁹⁾

Alum employed in the treatment of lead colic and as an emetic in the treatment of poisoning. A 1% to 4% solution is used as mouthwash or gargle in stomatitis and pharyngitis. Alum is either as a solid or as a solution may be used as touching with crystal of alum may treat a haemostatic for superficial abrasions, cuts and ulcers on the lips.⁽¹⁰⁾

Alum may be used as 0.5% irrigation in the treatment of leucorrhoea and it was used for the treatment of herpes simplex labialis.⁽¹¹⁾

The aim of this study is to assess the effect of alum suspension on healing of RAU.

PATIENTS AND METHODS

Fifty-two patients were included in our study, 28 females, 24 males; age range 20 to 40 years. All patients had at least monthly episodes of oral lesions and most patients had continuous involvement. All oral and/or topical corticosteroids and antibiotics used as therapy for aphthous stomatitis were discontinued and avoided during the study. A detailed history was taken for each patient particular attention was given to the frequency onset, duration and the associated degree of pain.

Clinical Examination

Clinical examination of RAU was classified according to the size as minor aphthae which were defined as those ulcers less than 5 mm in diameter (<5 mm in diameter) and major aphthae as those greater than 10mm (>5-10mm in diameter).

Each patient was randomly assigned 1, 3, 5, 7% suspension, at the early lesion four times daily for 3 consecutive days, then the patient reexamined at third day for determination of the response of treatment as follows; duration of lesions, patients self-evaluation of pain, size of lesions.

RESULTS

The age distribution of the 52 patients participated in the study shows non-significant difference between males and females and the most affected age group was the early twenties (78%) This is presented in figure (1). In regard to the site distribution of RAU, it seems that females had more ulcers on the tongue and less lesions on the cheek than males. This is presented in figure (2 and 3).

The difference in the effect of the different concentration of drug on the healing time was non significant for 1% concentration and placebo, while significant for 3, 5, 7% concentration of alum suspension (Table 1).

The P value for the 5 different groups compared to placebo was significant in the ulcer size, pain, and healing (Table 2).

Pain disappeared after treatment with alum from the first day of treatment.

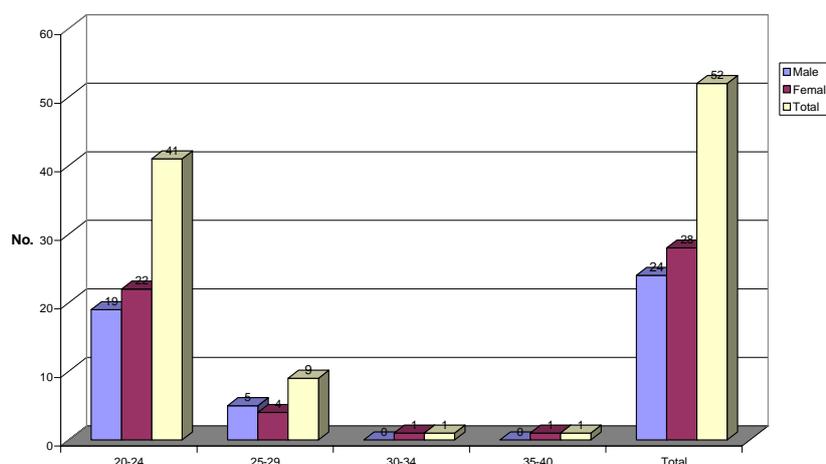


Figure 1: The age distribution in the (52) patients entering the study.

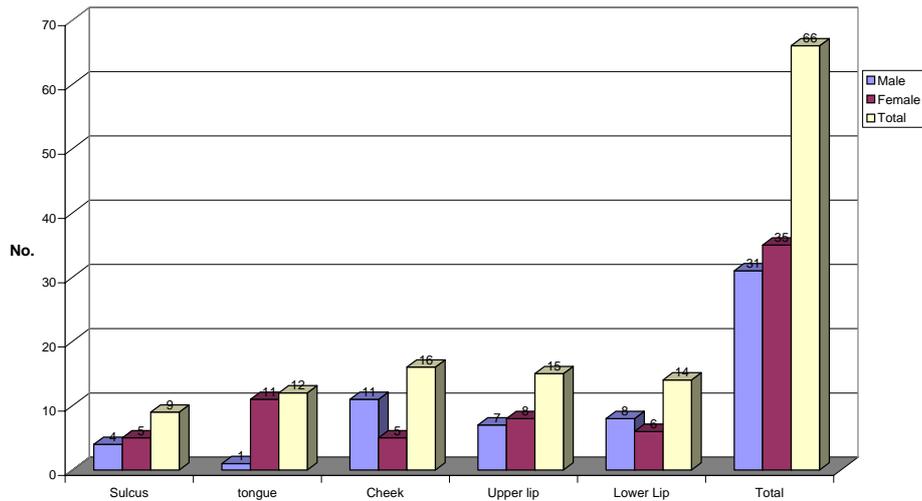


Figure 2: The site distribution of RAU in relation to sex variation.

Table 1: The difference in the effect of the different conc.of drug on the healing with days

Groups (alum concentration)	No. of days	%	No. of days	%	P-value	Sig
1%	6	12	4	25	0.124	NS*
3%	18	36	0	0	0.042	S**
5%	16	32	0	0	0.039	S
7%	10	20	0	0	0.032	S
Placebo	0	0	12	75	0.127	NS

*P>0.05 Non significant

**P<0.05 Significant

Table 2: The p-value for different groups with control

	P-value	Sig
Ulcer size	0.012	S*
Pain	0.002	S
Healing	0.007	S

*P<0.05 Significant

DISCUSSION

Goals in the management of RAU reflect that it is generally mild and self-limiting, and that, currently, there is no treatment widely believed to be curative. Therefore, treatments that reduce pain and maintain function during attacks, or that reduce the severity and frequency of recurrent attacks, are considered successful. Treatments used for this generally benign disease should not be associated with more morbidity than the disease itself. Treatment options are those that either provides palliation or those that truly alter the course of the disease. Palliative medications are generally applied topically and are available over the counter. Preparations of benzocaine,

dyclonine, or benzydamine can be effective. Also, mixtures of lidocaine, diphenhydramine, and Kaopectate may provide some relief. Other therapies that have been reported include hydrogen peroxide, phenol, silver nitrate, topical antimicrobials, antivirals, and antiseptic mouthwashes. These treatments are generally not very effective. The mainstay of treatment of RAU is topical steroid application. Triamcinolone 0.1% in a cream, paste or an aqueous base is the most commonly used.⁽¹²⁾

In this study alum show good healing for RAU and it's significant, alum a colorless mixed salt provides a natural antibacterial action, contains no alcohol. It's slightly

antiseptic, probably due to bacteriostasis through liberation of acid on hydrolysis.⁽⁹⁾

Astringent alum is locally applied protein precipitants, which have such low cell penetrability that the action is essentially limited to the cell surface and the interstitial spaces. The permeability of the cell membrane is reduced but cells remain viable.

The alum action is accompanied by contraction and wrinkling of the tissue and by blanching. The cement substance of the capillary endothelium is hardened, so that pathological trans-capillary movement of plasma protein is inhibited and local edema, inflammation and exudation are thereby reduced.^(13, 14)

Mucous or other secretions may also be reduced, so that the affected area becomes drier. Therefore, alum reduce inflammation of mucous membranes, promote healing. Also have the ability to interact with fatty acids liberated or produced by action of bacteria on lipids and by an action suppressing bacterial growth, partly because of a decrease in pH.

By this mechanisms alum treat the recurrent aphthous stomatitis.

Our suggestion is to assess the effect of other concentrations of alum and study the pharmacological evaluation, and study the effect of alum on other oral diseases.

REFERENCES

- 1- Greenberg MS. The efficacy and safety of 50 mg penicillin G potassium troches for recurrent aphthous ulcers. *Oral surgery oral medicine oral pathology oral radiology and endodontics* 2003; 96: 6, 685-94.
- 2- Tyldesley's oral medicine 5th Ed Anne field and Lesley longman. Oxford university press. 2003, chapter 5 oral ulceration.
- 3- Brad W, Douglas D, Carl M and Jerry E. *Oral and Maxillofacial pathology* by W.B. Saunders Company, 1995; chapter 9.
- 4- Macphil L. Topical and systemic therapy for recurrent aphthous stomatitis. *Semin Cutan Med Surg* 1998; Dec.; 16 (4): 301-7.
- 5- Olson JA, Sol silverman, JR. Double-blind study of livamisole therapy in RAU. *Journal of oral pathology* 1978; 7: 393-9.
- 6- Revuz A. Crossover study of thalidomide vs. placebo in sever recurrent aphthous stomatitis. *Arch Dermatol* 1990; 126.
- 7- Edward A, Graykowski, Albert Kingman. Double-blind trial of tetracycline in recurrent aphthous ulceration. *Journal of oral pathology* 1978; 7: 376-82.
- 8- Ship JA, Chavez EM, Doeir PA, Henson BS, Sarmadi M. Recurrent aphthous stomatitis. *Quintessence Int* 2000; 31 (2): 95-112.
- 9- Gennaro AR. *Astringents: Remington's pharmaceutical science*. Mack pub Co. Easton, Pennsylvania, 17 ed; 1985: 777.
- 10- Griffith: *Martindale extrapharmacopea*; 1989: 29.
- 11- Hurt WC. *Text Dent. J.* 1971, Jan; 89 (1): 21-2.
- 12- Murray, N, *Ulcerative Lesions of the Oral Cavity*. American Academy of Otolaryngology Head and Neck Surgery Foundation, Inc. 2000.
- 13- *Marriam- Webster Medical Dictionary*, 2002.
- 14- *WordNet R 1.6*, 1997 Princeton University.