ISSN: 1812–1217

The therapeutic effect of viscous solution of curcumine in the treatment of recurrent aphthous stomatitis (RAS)

Maha T Al–Saffar
BDS, MSc (Assist Lect)

Department of Basic Sciences
College of Dentistry, University of Mosul

ABSTRACT

Aim: To determine the various therapeutic effect of different concentrations of viscous curcumine solution on the healing of ulcer in patients with recurrent aphthous stomatitis (RAS). **Materials and Methods:** A total of 83 patients with RAS divided into four groups: Group A: Thirty patients received viscous solution of curcumine 10%; Group B: Thirty three patients received viscous solution of curcumine 50%; Group C: Ten patients without treatment (control negative); and Group D: Ten patients received glycerin treatment (control positive). **Results:** Females were more affected than males with RAS (69.9% female and 30.1% male) and upper and lower labial mucosa were the most common site of the lesion. The results also showed significant difference between complete healings in patients using viscous solution of curcumine 50% and 10% respectively, and patients without treatment (control negative), while there was no significant difference between the complete healing in patients use 50% of solution and 10 % of the same solution. **Conclusion:** Topical application of viscous solution of curcumine at 10% and 50% showed a good percentage of complete healing of ulcer in patients with RAS and further study for its effect on other oral lesion may be recommended.

Key Words: Recurrent aphthous stomatitis, antioxidant effect of curcumine, antibacterial effect of curcumine.

Al–Saffar MT. The therapeutic effect of viscous solution of curcumine in the treatment of recurrent aphthous stomatitis (RAS). *Al–Rafidain Dent J*. 2006; 6(1): 48-52.
Received: 15/9/2005 ***Sent to Referees:*** 21/9/2005 ***Accepted for Publication:*** 1/11/2005

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is superficial and rounded, or oval painful mouth ulcer with yellow base and red margin usually occurring in bouts at interval of few days to few months,[1, 2] usually there are 3 distinct clinical patterns:

- ✓ Minor small ulcers < 1 cm, healing within 14 days.
- ✓ Major–large ulcers > 1 cm, healing within 1–3 month.
- ✓ Herpetiform ulcers' multiple minute ulcers coalesce to produce ragged ulcer, the incidence is up to 20% of population.[3]

Its precise etiology was not clear and several possible causes had been determined such as hereditary, hematological deficiencies, psychology, trauma and hormonal changed,[4] viral, bacterial and there are also numerous investigations into possibility of an immune mechanism when certain antigens are present in lymphocyte sub–population.[5]

There is no curative treatment for RAS but treatment concentrated on the prevention of secondary infection and promotion of healing and this treatment of RAS include:

1- Non pharmacological treatment; e.g., oral hygiene.
2- Pharmacological treatment; e.g., liquid antacids, 3% hydrogen peroxide, water solution covering agents, topical analgesics, anesthetics, antiinflammatory, chlorhexidine mouth washes, localized steroid such as Kenalog in Orabase.[6]

Curcumine is the term for the substance in standardized extract of turmeric the deep yellow–orange spice common in Indian cooking.[7] It has a long history of safe use particularly in the treatment of inflammatory properties. Curcumine is a potent antioxidant stranger than vitamin E preventing lipid peroxidase *in vitro*.[8]

This study aimed to determine the clinical effect of topical application of viscous solution of curcumine at 10% and 50% and the complete healing of recurrent aphthous stomotitis (RAS).

MATERIALS AND METHODS

This study was carried out over period of 8 months at private dental clinic in Mosul City from December 2004 to August 2005. It included 90 patient (62 females, 28 males); 7 patients not return back (4 females, 3 males), so they did not include in this study.

The diagnosis of RAS in this clinical trial was according to Ship[2] description of RAS.

The onset of the disease RAS in the present study occurred in females more than males (Table 1). Patients participated fulfill following criteria:

- ✓ No history of systemic disease.
- ✓ Patients should not begin any drug therapy.

Table (1): Distribution of study samples

Sex	No.	Percentage
Male	25	30.1
Female	58	69.9
Total	83	100

The patients were divided into four groups:

Group A: Included 30 patients with RAS and treated by viscous curcumine solution 10%.

Group B: Included 33 patients with RAS and treated by viscous curcumine solution 50%.

Group C: Included 10 patients with RAS without treatment (control negative).

Group D: Included 10 patients with RAS and treated by glycerin vehicle (control positive).

For groups A and B, the viscous curcumine solution prepared by dissolving curcumine which is rhizome portion of the plant used medically and it is usually boiled, cleaned and dried yielding yellow powder[9] in glycerin in two concentrations 10% (10 gm of grinded curcumine in 100 ml of glycerin), and 50% (50 gm of grinded curcumine in 100 ml of glycerin), then the viscous solution was given for every patient respectively. In groups A, B and D, patients were advised to use viscous solution (in groups A and B) and glycerin vehicle (in group D) topically by using cotton pad immersed in viscous solution, then applied to oral lesion of RAS gently 2–3 times daily. The patients were advised not to intentionally disturb medication by licking or sucking the area. All patients were seen every 1–3 days, usually every second day, the appearance of lesion, zone of inflammation and pain were recoded at each visit during the healing phase.

Evaluation of effectiveness of treatment was based on healing time and symptomatic relief between individual treatment for each patient information recorded (Figure).

The results were analysed statistically by using Kolmogorov–Smirnov test.[10]

Name: Age: Sex:

- ❖ Site of Lesion:
- ❖ Size of Lesion:
- ❖ Grade of Pain:

- ❑ Absence of Pain.
- ❑ Presence of Pain.

- ❖ Sign of Healing.
- ❖ No Pain Completely.
- ❖ No Inflammatory Zone.

Figure: Case sheet record

RESULTS

A total of 83 patients participated in this study, most of them were females (69.9% females, 30.1% males).

The mean age of the samples was 25.83 $\pm$ 8.68 years for males and 30.2 $\pm$ 10.05 for females, respectively (Table 2).

The distribution of intraoral lesion in

this study was almostly located in lower and upper labial mucosa, followed by buccal mucosa and tongue (Table 3).

The mean size of lesion recorded at the time of initiation of treatment was 0.6 ± 0.3 mm (only minor aphthous ulceration, major aphthous ulceration were not included).

Table (2): Descriptive statistics of study samples for both sexes

Sex	No.	Mean ± SD	Minimum	Maximum
Male	25	25.83 ± 8.68	10	40
Female	58	30.20 ± 10.05	10	46
Total	83	28.41 ± 9.67	10	46

SD: Standard deviation.

Table (3): Distribution of intraoral lesion

Site	No. and Percentage of Cases
Labial Mucosa (Lower)	35 (42.1%)
Labial Mucosa (Upper)	23 (27.7%)
Buccal Mucosa	12 (14.5%)
Ventral Surface of Tongue	13 (15.7%)

Complete recovery or healing (no pain and no inflammation) had been occurred from 5 days (73% patients) to 11 days (6.6 patients) by using viscous curcumine solution 10% (Table 4). While complete recovery had been occurred from 5 days (78.7%) to 11 days (3.2%) by using viscous curcumine solution 50% (Table 5). However, in control negative group (without treatment), the complete recovery had been occurred from 5 days (20%) to 11 days (40%) (Table 6).

In control positive group (received glycerin vehicle treatment), the complete recovery had been occurred from 5 days (30%) to 11 days (20%) (Table 7).

Table (4): Number and percentage of patients, duration of ulcer healing in patients receiving 10% curcumine solution

No. and Percentage of Cases	Duration of Healing of Ulcer
22 (73%)	5 Days
6 (21%)	7 Days
2 (6%)	11 Days
Total 30 Patients (100%)	

Table (5): Number and percentage of patients, duration of ulcer healing in patients receiving 50% curcumine solution

No. and Percentage of Cases	Duration of Healing of Ulcer
26 (78.7%)	5 Days
6 (18.1%)	7 Days
1 (3.2%)	11 Days
Total 33 Patients (100%)	

Table (6): Number and percentage of patients, duration of ulcer healing in control negative group

No. and Percentage of Cases	Duration of Healing of Ulcer
2 (20%)	5 Days
4 (40%)	7 Days
4 (40%)	11 Days
Total 10 Patients (100%)	

Table (7): Number and percentage of patients, duration of ulcer healing in control positive group

No. and Percentage of Cases	Duration of Healing of Ulcer
3 (30%)	5 Days
5 (50%)	7 Days
2 (20%)	11 Days
Total 10 Patients (100%)	

There was a significant difference in percentage of complete healing between control negative group and groups of patients using viscous solution of curcumine 10% and 50% ($p \leq 0.05$) and there was a significant difference in percentage of complete healing between control positive group, groups of patients using viscous solution of curcumine 10% and those using viscous solution of curcumine 50% ($p \leq 0.05$). While there is no significant difference between groups of patients using viscous solution of curcumine 10% of those using viscous solution of curcumine 50% ($p > 0.05$).

DISCUSSION

As the etiology of pathogenesis of RAS were not well established this disease continue to be difficult to treat.[11] According to this study, females were more susceptible to RAS than males. This is due to the effect of hormonal change and stressful situation in female more than male which considered as important eotiological factor of RAS. This was in agreement with the study of Rogers.[12]

The distribution of intraoral lesion in this study demonstrated that labial mucosa in the upper and lower lip were the most common sites of RAS compared with buccal mucosa and tongue. This is due to the fact that these sites are more liable to trauma from smoking, hot objects, biting…etc. which also considered as important factor in the developing of RAS. This was in agreement with the study of Sam *et al*.[5]

This study showed that there was no significant difference in percentage of complete healing of RAS by using 10% and 50% of viscous solutions of curcumine. Curcumine had the same effect on degree of inflammation and pain so there is no need to use a high percentage of solution to produce the same effect produced by low percentage.

The potent antioxidant effect of curcumine due to inhibition of arachidonic acid in corporation into membrane lipids blocks cyclooxygenase and lipooxygenaxe activity, thereby inhibiting prostoglandin leukotriene release.[13–15]

Curcumine also exhibits potent antiinflammatory effects.[16] Oral administration of curcumine in instances of acute inflammation was found to be as effective as cortisione or phenylbutazone and one–half as effective in cases of chronic inflammation.[17] The antiinflammatory properties may be attributed to its ability to inhibit pro–inflammatory arachidonic acids as well as neutrophil function during inflammatory state.[9]

Although several studies have shown that RAS could be treated by preventing the synthesis of endogenous TNf–α, which is a major inflammation mediator may contribute the activation and recruitment of leukocytes that are found in RAS lesion.[15]

Curcumine also inhibits the growth of a variety of bacteria, parasite and pathogenic fungi (antimicrobial effect).[18]

These multiple effects of curcumine were also proved by the study when viscous solution of curcumine (10% and 50%) produce significant differences in percentage of complete healing of RAS when compared with control groups of patient without treatment.

CONCLUSION

The topical application of various concentration of viscous solution of curcumine (10% and 50%) showed a good percentage of healing in patients with RAS when compared with control patients with RAS which received no treatment (control negative) and patients with RAS which received glycerin treatment (control positive).

REFERENCES

1. Porter S, Scully C. Recurrent aphthous ulcers. *Oral Health*. 2004; Apr: 2-4.
2. Ship JA. Recurrent aphthous stomatitis. *Oral Surg Oral Med Oral Pathol*. 1996; 81: 141-247.
3. Porter SR, Hegarty A, Kaliakatsour F. Recurrent aphthous stomatitis. *Clin Dermatol*. 2000; 18: 569-578.
4. Khandwalo A, Van–Inwegen RG, Alfano MC. 5% amlexanox oral paste: A new treatment for recurrent minor aphtous ulcers, clinical demonstration of acceleration of healing and resolution of pain. *Oral Surg Oral Med Oral Pathol*. 1997; 83: 222-230.
5. Neville BD, Damm DD, Allen CM, Bouquot JE. Oral and Maxillofacial Patholo-

gy. 2nd ed. WB Saunders Co. China. 2002; Pp: 285-290.
6. Greenberg MS, Glick M. Burket's Oral Medicine Diagnosis and Treatment. 10th ed. BC Decker Inc. Spain. 2003; Pp: 63-65.
7. Janson MD. Curcumine. *Healthy Living*. 2000; 2(3): 1-3.
8. Wallace JM. Nutrional and botanical modulation of the inflammtory cascade –Eicocanoids, cyclooxygenases, and lipooxygenases– as an adjunct in cancer therapy. *Integr Cancer Ther*. 2002; 1(1): 7-25.
9. Thorne R. Curcuma longa (Turmuric). *Altern Med Rev*. 2001; 6: 62-68.
10. Hettmansperger TP, Sheather SJ. Confidence intervals based on interpolated order statistics. *Stat Prob Letters*. 1986; 4(2): 75-79.
11. Shehab NM, Mahmood IH, Abdul–Karim N. Treatment of recurrent aphthous ulcer with levamisole (uncontrolled) clinical trial. *Iraqi J Pharmacol*. 2002; 2(1): 52-56.
12. Rogers RS. Recurrent aphthous stomatitis in the diagnosis of Behçet's disease. *Yonsie Med J*. 1997; 38(6): 370-379.
13. Joe B, Lokesh BR. Curcumine and capsaicin lower the release of lysosomal enzymes and eicosanoids in rat peribneal macrophage. *Mol Cell Biochem*. 2000; 203(1-2): 153-161.
14. Chainaniwu N. Safety and antiinflammatory activity of curcumine. *J Altern Complement Med.* 2003; 9(1): 161-168.
15. Natah SS, Konttinen YT. Immunolocalization of tumour necrosis factor expressing cells in recurrent ulcer lesion. *J Oral Pathol Med*. 2000; 29(1): 19-25.
16. Kawamori T, Lubet R, Steele VE. Chemopreventative effect of curcumine anaturally occuring antiinflammatory agent, during the promotion/progression stage of colon cancer. *Cancer Res*. 1999; 59: 597-601.
17. Mukhopadhyay A, Basu N, Ghatak N. Antiinflammatory and irritant activities of curcumine analogues in rats. *Agents Actions*. 1982; 12: 508-515.
18. Allen PC, Danforth HD, Augustin PC. Dietary modulation of arian cocidiosis. *Int Parasitol*. 1998; 28: 1131-1140.