

Effectiveness of Honey and *Aloe Vera* in the Treatment of Minor Aphthous Ulcer among Young Adults-A Single Blinded Randomized Clinical Trial

Henna Mir¹, Shivalingesh K K², Waseem Ashraf³, Divya Srivastava¹, Adeeba Saleem¹

¹MDS, Department of Public Health Dentistry, Institute of Dental Sciences Bareilly, Bareilly, Uttar Pradesh, India, ²Professor and Head, Department of Public Health Dentistry, Institute of Dental Sciences Bareilly, Bareilly, Uttar Pradesh, India, ³MDS 3rd Year, Department of Oral Medicine and Radiology, Vyas Dental College Jodhpur, Jodhpur, Rajasthan, India

Abstract

Background: Recurrent aphthous stomatitis (RAS) with a prevalence of 5–25% is one of the most prevalent oral mucosal diseases found worldwide. Herbal remedies have been advocated as an alternative method of therapy such as honey and *Aloe vera*. Therefore, the purpose of this analysis is to compare the effects of topical *A. vera* and honey on minor aphthous stomatitis ulcers.

Materials and Methods: This research consisted of 60 clinically diagnosed people with minor aphthous stomatitis diagnosed clinically.

Results: The reduction in the size of ulcer was little more in Group B (*A. vera*) as compared to Group A (honey) at visit 2 (0–3 day). However, the difference was statistically not significant at 1st Visit, 3rd and 7th Visit ($P > 0.05$).

Discussion: It has been detected that the main antibacterial activity in honey is due to enzymatically produced hydrogen peroxide in the honey. In the present study, pain level and burning sensations were assessed by VAS scores, which showed improvement in the honey group.

Conclusion: The present study revealed that both the remedies were effective in the treatment of aphthous ulcer. Although in this study, we found honey to be more effective than *A. vera* in the reduction of pain and burning sensation, further studies with larger sample size in a controlled environment need to be done to prove the same.

Key words: *Aloe vera*, Aphthous ulcer, Burning sensation, Honey, Pain

INTRODUCTION

Recurrent aphthous stomatitis (RAS) etiology is very diverse and includes systemic, genetic, local, and immune factors, as well as food and chemical sensitivities, bacterial and viral agents.^[1] Other etiological factors have also been suggested, such as stress, physical or chemical trauma.^[2] For the treatment of RAU, antimicrobials, topical analgesics, immunosuppressive agents, anti-inflammatory agents, and laser therapy have all been used.^[3] Herbal remedies have

been advocated as an alternative method of therapy because of the potential adverse effects of steroid medication and the risk for the development of secondary oral candidiasis from long-term steroid use. Several herbal products for the promotion of wound healing have been investigated.^[4] *Aloe vera* is a tropical plant grown in North Africa and most areas of Asia with succulent leaves which have been used for thousands of years as herbal medicine.^[5] The healing property of *A. vera* has been highlighted by large number of studies. According to literature, the enhanced healing of *A. vera* is by increasing the flow of blood, which further results in increase in oxygenation.^[6]

Honey is nectar extracted and collected by honey bees from several plants. In wound care, honey has major benefits, especially for the treatment of chronic and contaminated wounds.^[7] Very few studies have been performed to show the effects of *A. vera* and honey on RAS. The purpose

Access this article online



www.ijss-sn.com

Month of Submission : 01-2022
Month of Peer Review : 01-2022
Month of Acceptance : 02-2022
Month of Publishing : 03-2022

Corresponding Author: Dr. Henna Mir, Department of Public Health Dentistry, Institute of Dental Sciences Bareilly, Bareilly, Uttar Pradesh, India.

of this analysis is thus to compare the effects of topical *A. vera* and honey on minor aphthous stomatitis ulcers. This research consisted of 60 clinically diagnosed people with minor aphthous stomatitis diagnosed clinically. The entire sample was randomly divided into two groups with 30 patients each.

MATERIALS AND METHODS

From November 2018 to November 2019, this study was performed in the Public Health Dentistry Department. This research consisted of 60 clinically diagnosed people with minor aphthous stomatitis diagnosed clinically, who gave informed consent. Consent was also obtained from the Institutional Ethical Committee. The entire sample was randomly divided into two groups with 30 patients each. The subjects were provided with the honey and *A. vera* in similar colored containers. To measure the effectiveness of honey and *A. vera* gel in Group A and Group B respectively, patients were advised to spread a thin layer of *A. vera* and honey using sterile cotton applicator 4 times daily (after meals and at bedtime) for 7 days as a sole remedy without using any other medication. After both medications were applied, all patients were advised to avoid solid and liquid diets for 30 min. On the 3 day, the patients were recalled for follow-up and were again prescribed the medicine for 4 days following the aforementioned guidelines. Patients were recalled for further evaluation on the 7th day.

Inclusion Criteria

- The study involved patients who had a positive history of having similar oral mucosal ulcers for 3–4 months and ulcers for <48 h.
- Clinically diagnosed patients with chronic aphthous stomatitis measuring ≤ 5 mm in size in the oral cavity and who gave written consent for participation.
- Only single ulcers were considered for the study.

Exclusion Criteria

- The study excluded patients with a history of associated systemic disease.
- Cases of chronic aphthous stomatitis (major), lesions of herpetic form, numerous RAS lesions, and smoking.
- In addition, no consideration was given to patients with a history of hypersensitivity to honey or *A. vera*.

Clinical Parameters

The following clinical parameters have been recorded and evaluated.

- a. Size of ulcers (in mm)-after starting treatment, ulcer size was recorded on every 3 day and 7th day/till the ulcer heals completely using a calibrated dental probe with millimeter marking.

- b. Pain-Visual Analog Scale (0–10) was used to determine the intensity of pain.
- c. Burning sensation-Visual analog scale (0–10) was also used to determine the intensity of burning sensation.

Statistical Analysis

The data were entered on the Microsoft Excel spreadsheet and imported for statistical analysis into the Statistical Package for Social Sciences (SPSS) version 22. Frequency distribution tables were created, and the chi square test was used to determine variable's association. Mean and standard deviations were measured for ulcer size, VAS scores for pain and burning sensation, and significant differences were observed by applying the Independent t-test. Statistical significance was set at $P < 0.05$.

RESULTS

Table-1 is showing the age group distribution of Group A (Honey) and Group B (*Aloe vera*).

Table 2 is showing that in Group A (Honey), out of 60 patients 24 (40%) patients were Male and 36 (60%) patients were Female. In group B, 28 (46.7%) patients were male and 32 (53.3 %) patients were female. There was no significant difference in gender of patients in between Group A (Honey) and in Group B (*A. vera*) ($P > 0.05$).

- Table 3 is revealing that the most common site in Group A (Honey) was Lateral border of tongue that is in 40% (24 out of 60), followed by 30% in both of Buccal Mucosa (18 out of 60) and Labial Mucosa (18 out of 60).
- In group B, the Labial Mucosa was the most common site-40% (24 out of 60), followed by Lateral border of tongue that is in 33.3% (20 out of 60) and 26.7 % (16 out of 60) in Buccal Mucosa.
- There was no significant difference in site of ulcer in between Group A (Honey) and Group B (*A. vera*) ($P > 0.05$).

Table 4 shows that the size of the ulcer ranges from 1 to 4 mm in diameter in the entire sample. The mean and standard deviation were compared for the size of ulcer. The mean size of ulcer in patients receiving honey at the time of visit 1 (i.e., 0th day) was 3.70 ± 0.47 mm; whereas, at visit 3 (i.e., 7th day), the ulcer had disappeared completely.

The mean size of ulcer receiving *A. vera* at the time of visit 1 was 3.63 ± 0.49 mm; whereas, at visit 3, the ulcer had disappeared completely. The reduction in the size of ulcer was little more in Group B (*A. vera*) as compared to Group A (honey) at visit 2 (0–3 day). However, the difference was statistically not significant at Ist Visit, 3rd and 7th Visit ($P > 0.05$).

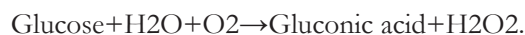
Table 5 reveals the mean VAS score for Pain in Group A (Honey) at the time of visit 1 was 6.10 ± 0.84 , reduced to 0 at visit 7th day visit. The mean VAS score for Pain in Group B (*A. vera*) at the time of visit 1 was 6.25 ± 1.00 , and reduced to 0 at visit 7th day visit. The change in VAS scores for pain at visit 2 (0–3 day) in Group A, that is, patients receiving Honey group was little bit more as compared to Group B (*A. vera*), and the difference was statistically significant at 3rd day Visit ($P < 0.05$), and the difference was not significant at 1st and 7th day Visit ($P > 0.05$).

Table 6 reveals the mean VAS score for burning sensation in Group A (Honey) at the time of visit 1 was 7.70 ± 0.79 and reduced to 0 at 7th visit day. The mean VAS score for burning sensation in Group B (*A. vera*) at the time of visit 1 was 7.87 ± 0.76 , and reduced to 0 at visit 7th day visit. The change in VAS scores for burning sensation at visit 2 (0–3 day) in Group A, that is, patients receiving Honey was more as compared to Group B (*A. vera*), and the difference was statistically significant at 3rd Visit ($P < 0.05$), difference was not significant at 1st and 7th Visit ($P > 0.05$).

DISCUSSION

The most common ulcerative disease of the oral mucosa is RAS. Its diagnosis and management constitute common problems in dental practice. In the present study, herbal medicine like honey and *A. vera* has been examined as an alternative topical therapy for minor RAS.

In folk medicine, herbal products have been used for many years. Van Ketel in 1892 first recognized the antibacterial property of honey. When diluted at least 9 times, honey has adequate antibacterial potency to stop bacterial development due to its acidic pH, hygroscopic properties, and hydrogen peroxide.



It has been detected that the main antibacterial activity in honey is due to enzymatically produced hydrogen peroxide in the honey. It also induces the release of cytokines, tumor necrosis factors alfa, interleukin 1 (IL 1) and IL 6 by monocytes in cell culture, which triggers the immune response to infection.^[8]

In the present study, pain level and burning sensations were assessed by VAS scores, which showed improvement in the honey group. These findings were in contrast with the studies conducted by Yelmaz *et al.*^[7] and Pandharipande *et al.* where the researchers found that Curcumin group showed statistically significant result as compared to honey.^[9] However, Haddad *et al.* conducted a study which was in

Table 1: Age group distribution of Group A (Honey) and Group B (*Aloe vera*)

Age (in years)	Group A (Honey)		Group B (<i>Aloe vera</i>)	
	Number	Percentage (%)	Number	Percentage (%)
<20	10	16.7	6	10.0
20–29	31	51.6	32	53.3
≥30	19	31.7	22	36.7
Total	60	100.0	60	100.0

$\chi^2=3.273$, P -value=0.195 (not significant)

Table 2: Gender distribution of Group A (Honey) and Group B (*Aloe vera*)

Gender	Group A (Honey)		Group B (<i>Aloe vera</i>)	
	Number	Percentage (%)	Number	Percentage (%)
Male	24	40.0	28	46.7
Female	36	60.0	32	53.3
Total	60	100.0	60	100.0

$\chi^2=0.857$, P -value=0.836 (not significant)

Table 3: Site of ulcer in Group A (Honey) and Group B (*Aloe vera*)

Site	Group A (Honey)		Group B (<i>Aloe vera</i>)	
	Number	Percentage	Number	Percentage
Buccal Mucosa	18	30.0	16	26.7
Labial Mucosa	18	30.0	24	40.0
Lateral border of tongue	24	40.0	20	33.3
Total	60	100.0	60	100.0

$\chi^2=0.669$, P -value=0.716 (not significant)

Table 4: Size of ulcer in Group A (Honey) and Group B (*Aloe vera*) at different visit.

Size	Group A (Honey)	Group B (<i>Aloe vera</i>)	t-value	P-value
	Mean±SD	Mean±SD		
1 st Visit	3.70±0.47	3.63±0.49	0.770	0.443
3 rd Visit	1.50±0.50	1.30±0.65	1.891	0.061
7 th Visit	0.0±0.0	0±0	0	0

SD: Standard deviation

Table 5: VAS score for pain in Group A (Honey) and Group B (*Aloe vera*) at different visit

Visit	VAS score for pain		t-value	P-value
	Group A (Honey) Mean±SD	Group B (<i>Aloe vera</i>) Mean±SD		
1 st day Visit	6.10±0.84	6.25±1.00	0.890	0.376
3 rd day Visit	1.40±0.68	1.73±0.76	2.558	0.012*
7 th day Visit	0±0	0±0	0	0

*statistically significant, SD: Standard deviation

agreement to our study which concluded that honey was safe and effective in reducing minor aphthous ulcer pain,

Table 6: VAS score for burning sensation in Group A (Honey) and Group B (*Aloe vera*) at different visit

Visit	VAS score for burning sensation		t-value	P-value
	Group A (Honey)	Group B (<i>Aloe vera</i>)		
	Mean±SD	Mean±SD		
1 st day Visit	7.70±0.79	7.87±0.76	1.156	0.250
3 rd day Visit	1.80±0.76	2.08±0.50	2.429	0.017*
7 th day Visit	0±0	0±0	0	0

*statistically significant, SD: Standard deviation

size and erythema.^[10] The effect of honey on the healing of oral ulcers conducted by Mohamed *et al.* was also in accordance to our study. In this research, the investigators concluded that the ulcerations disappeared entirely after 3 days of honey dressing therapy.^[11]

Different mechanisms have been proposed to elucidate the wound-healing effects of *A. vera*, including keeping the wound moist, increasing epithelial cell migration, rapid maturation of collagen, enhancing collagen cross-linking, and increasing blood supply. Glucomannan and gibberellin, two constituents of *A. vera*, interact with growth factor receptor on fibroblasts, stimulating their activity and proliferation, to increase collagen synthesis. The anti-inflammatory effects of aloe are related to its inhibition of the cyclooxygenase pathway of arachidonic acid and reduction of prostaglandin E2. The anti-inflammatory compound, C-glycosyl chromone, was isolated from *A. vera* extracts, as well as the peptidase bradykinase which breaks down bradykinin that induces pain.^[2]

A research to explain the safety and efficacy of acemannan, a polysaccharide isolated from *A. vera*, in the treatment of oral aphthous ulceration, was performed by Bhalang *et al.* The investigators concluded that acemannan's efficacy was superior to that of control in reducing ulcer size and pain which was in contrast to our study.^[4]

In terms of pain and burning sensations, *A. vera* gel had a better response as concluded by Giroh *et al.*, which was in contrary to our study.^[12] However, our study was in agreement with a study conducted by Babaee *et al.* which concluded that the healing times for pain were significantly lower in the *A. vera* treated group.^[5]

In the present study, honey and *A. vera* were compared for the treatment of minor aphthous ulcer. *A. vera* was more efficient in the reduction of ulcer size; however, the results were not statistically significant. In the reduction of pain and burning sensations, honey scored better as compared to *A. vera*, and the results were statistically significant.

CONCLUSION

The present study revealed that both the remedies were effective in the treatment of aphthous ulcer. These herbal remedies, therefore, can be recommended for use in place of conventional treatment modality in the management of RAS as they are cost-effective, easily available and possibly no adverse effects. Although in this study, we found honey to be more effective than *A. vera* in the reduction of pain and burning sensation, further studies with larger sample size in a controlled environment need to be done to prove the same.

REFERENCES

- Mansour G, Ouda S, Shaker A, Abdallah MH. Clinical efficacy of new aloe vera- and myrrh-based oral mucoadhesive gels in the management of minor recurrent aphthous stomatitis: A randomized, double-blind, vehicle controlled study. *J Oral Pathol Med* 2014;43:405-9.
- Baccaglioni L, Lalla RV, Bruce AJ, Sartori-Valinotti JC, Latortue MC, Carozzo M, *et al.* Urban legends: Recurrent aphthous stomatitis. *J Oral Dis* 2011;17:755-70.
- Lewkowicz N, Kur B, Kurnatowska A, Tchorzewski H, Lewkowicz P. Expression of Th1/Th2/Th3/Th17-related genes in recurrent aphthous ulcers. *Arch Immunol Ther Exp (Warsz)* 2011;59:399-406.
- Bhalang K, Thunyakitpisal P, Rungsirisatean N. Acemannan, a polysaccharide extracted from *Aloe vera*, is effective in the treatment of oral aphthous ulceration. *J Alternat Complement Med* 2013;19:426-34.
- Babaee N, Zabihi E, Mohseni S, Moghadamnia A. Evaluation of the therapeutic effects of *Aloe vera* gel on minor recurrent aphthous stomatitis. *Dent Res J* 2012;9:381-5.
- Sujatha G, Kumar SG, Muruganandan J, Prasad ST. *Aloe vera* in dentistry. *J Clin Diagn Res* 2014;8:Z101-2.
- Yılmaz N, Nisbet O, Nisbet C, Ceylan G, Hosgor F, Dede D. Effectiveness of honey in oral mucosal ulcers. *Bosn J Basic Med Sci* 2009;9:290-5.
- Hassan S, Shah A, Hakim T, Teli Z. Honey in the management of dry socket. *Ann Int Med Dent Res* 2010;2:255-7.
- Pandharipande R, Chandak R, Sathawane R, Lanjekar A, Gaikwad R, Khandelwal V, *et al.* To evaluate efficiency of curcumin and honey in patients with recurrent aphthous stomatitis: A randomized clinical controlled trial. *Int J Res Rev* 2019;6:449-55.
- Haddad S, Shawaf M. Effect of honey for treatment of some common oral lesions: Follow up of 50 cases. *J Dent Oral Hyg* 2013;5:55-61.
- Mohamed S, Douri A. The effect of honey on the healing of oral ulcers (clinical study). *Al-Rafidain Dent J* 2008;8:157-60.
- Giroh RV, Hebbale M, Mhapuskar A, Hiremutt D, Agarwal P. Efficacy of *Aloe vera* and triamcinolone acetonide 0.1% in recurrent aphthous stomatitis: A preliminary comparative study. *J Indian Acad Oral Med Radiol* 2019;31:45-50.

How to cite this article: Mir H, Shivalingesh KK, Ashraf W, Srivastava D, Saleem A. Effectiveness of Honey and *Aloe Vera* in the Treatment of Minor Aphthous Ulcer among Young Adults-A Single Blinded Randomized Clinical Trial. *Int J Sci Stud* 2022;9(12):31-34.

Source of Support: Nil, **Conflicts of Interest:** None declared.