

Virgin coconut oil in the treatment of minor recurrent aphthous ulcer in central Kerala population- A pilot study

¹Dr. Gigi Roy, MDS, Private Practitioner, Department of Oral Medicine and Radiology.

²Dr. Anu Vijayan, MDS, Reader, Department of Oral Medicine and Radiology, Mar Baselios Dental College.

³Dr. Beena Kumari T P, MDS, Professor and HOD, Department of Oral Medicine and Radiology, Mar Baselios Dental College.

⁴Dr. Sonia Susan Philip, MDS, Assistant Professor, Department of Oral Medicine and Radiology, Mar Baselios Dental College.

⁵Dr. Sheeba Padiyath, MDS, Professor Department of Oral Medicine and Radiology. Mar Baselios Dental College.

⁶Dr. Anju Elizabeth Thomas, MDS, Assistant Professor, Department of Oral Medicine and Radiology, Mar Baselios Dental College.

Corresponding Author: Dr. Gigi Roy, MDS, Private Practitioner, Department of Oral Medicine and Radiology.

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Abstract

Background: Recurrent aphthous stomatitis (RAS; aphthae; canker sores) is a common oral mucosal disorder in which the treatment modalities for RAS are aimed at providing symptomatic relief. Consumption of virgin coconut oil (VCO) is more superior in antioxidant property than coconut oil extracted by dry process. Amlexanox is an anti-inflammatory, antiallergic and immunomodulator drug that is used commonly to treat recurrent aphthous ulcers (canker sores).

Objectives: The study aimed to compare the effectiveness between virgin coconut oil and Amlexanox 5% oral paste in the management of minor recurrent aphthous ulcer.

Methods: A randomized comparative evaluation in which 20 subjects were divided equally into two groups and were given different medication for the RAS. Subjects for group 1 were given VCO, while the group 2 were given Amlexanox. Tools used in this research were pain score and the size of the ulcer. Both ulcer size and pain score were taken on the day 1, day 3 and day 5. Data were collected, entered in MS Excel spreadsheet, and analyzed using SPSS software.

Results: The mean reduction of ulcer size from day 1 to day 3 and day 1 to day 5 by using Amlexanox 5% was more when compared to VCO. The mean pain score relieved by using Amlexanox 5% and VCO from day 1 to day 3 was same and day 1 to day 5 was very close.

The results showed that no significant differences were found between two groups.

Conclusion: Virgin coconut oil can be an alternative medicament for treatment of recurrent aphthous stomatitis.

Keywords: Recurrent aphthous stomatitis, Amlexanox, Virgin coconut oil, Management, Antioxidant

Introduction

Recurrent aphthous stomatitis (RAS; apthae; canker sores) is a common disorder characterized by recurring ulcers confined to the oral mucosa in patients with no other signs of systemic disease.^[1] There is no curative treatment for RAS. The goals of the treatment include decrease the symptoms, reduce the number and size of the ulcers and increase the duration of the disease-free state with minimal adverse effects.^[2,3,4]

Coconut (*Cocos nucifera*) is a common tree which has nutritional and medicinal values. Coconut oil is an important product that has various oral and overall health benefits, is obtained from the fruit and virgin coconut oil (VCO) is a recently emerging potent microbicidal used for oral and other purposes, is obtained from the coconut kernel by wet processing with or without the use of heat and without undergoing chemical refining.^[5,6] VCO has high content of biologically active components and is superior in antioxidant property than coconut oil extracted by dry process.^[7,8]

Amlexanox is an anti-inflammatory antiallergic and immunomodulator drug. It is used commonly to treat recurrent aphthous ulcers (canker sores). The adverse effects may include transient pain, stinging and/or burning at the site of application. The less frequent side effects are contact mucositis, nausea, and diarrhea.^[9]

Therefore the study was conducted with the objective to compare the effectiveness between virgin coconut oil

and Amlexanox 5% oral paste in the management of minor recurrent aphthous ulcer.

Materials And Methods

Study design, study area and subjects

It was a single blinded randomized comparative study conducted among patients from outpatient department visiting the Department of Oral Medicine and Radiology of Mar Baselios Dental College in Kerala. The data collection was done from June 2019 to August 2019. Patients who were willing to participate in the study, aged between 18-60 years and ulcer size less than 10mm and not more than 3days were included in the study. Patients with any systemic disease (diabetes) and immunodeficiency state, smokers, undergoing systemic or topical corticosteroid therapy, pregnant women or lactating mothers, usage of analgesic or antibiotic 3 months prior to the study were excluded.

Sample size and selection of study subjects

Sample size was a total of 20 subjects who satisfied all inclusion and exclusion criteria were selected. Institutional ethical clearance (IEC/02 /EXP/ MBDC/ 2019) of Mar Baselios Dental College was obtained. Patients were selected by systematic random sampling. Selected individuals were included in the study after getting their informed verbal consent.

Study tool/ techniques

Twenty subjects with minor aphthous ulcer were divided equally into two groups. Subjects in group 1 were given VCO while group 2 were given Amlexanox 5%. The criteria used were pain score and ulcer size. Visual analogue scale (VAS) was used to assess pain score and ulcer size was measured by vernier caliper. Both ulcer size and pain score were taken on day 1. Subjects were instructed to apply two drops of VCO in cotton given in a small bottle and Amlexanox 5% topically over the area of ulcer for 5minutes thrice a day for 5 consecutive days.

On day 3 and 5, ulcer size and pain score were assessed again.

Data Analysis

All analysis was performed by using SPSS statistical software. The data was analyzed using independent t test to compare the mean between two groups. $P < 0.05$ indicate significant differences between two groups.

Results

The mean reduction of ulcer size from day 1 to day 3 and day 1 to day 5 by using Amlexanox 5% was more when compared to VCO (Table 1 and 2). But values were closer. The mean pain score relieved by using Amlexanox 5% and VCO from day 1 to day 3 was same and day 1 to day 5 was very close (Table 3 and 4). The results showed that no significant differences were found between two groups. Thus the mean comparison revealed that the effect of VCO was same as that of Amlexanox in reducing ulcer size and relieving pain.

Discussion

Recurrent aphthous stomatitis is a common disorder characterized by recurring ulcers confined to oral mucosa in patients with no other signs of systemic diseases. Several local, systemic, immunologic, genetic, allergic, nutritional, and microbial factors have been proposed as predisposing factors. Ulcers are round with well-defined erythematous margins and a shallow ulcerated center covered with yellowish-gray fibrinous pseudo membrane.^[4] Management is tailored to the severity of the disease.^[1]

Halim SD et al (2014) conducted single blinded randomized clinical trial on Comparison of the Effectiveness between Virgin Coconut Oil (VCO) and Triamcinolone for Treatment of Minor Recurrent Aphthous Stomatitis (RAS) and concluded that VCO can be used for treating RAS as it was better in reducing ulcer size and relieving pain.^[3]

Horas R (2017) conducted a prospective study to evaluate the beneficial effect of post-operative application of VCO product in Padang West Sumatra on palatoplasty wound healing and concluded VCO accelerated wound healing, accompanied by an increased number of fibroblast cells appeared in the wound, as well as fewer pain complaints.^[10]

Nevin and Rajmohan (2010) conducted a study to evaluate the effect of virgin coconut oil (VCO) by topical application on excision wounds in young rats. The wounds that was treated by VCO healed much faster. The time taken for complete epithelization was less. A significant increase in pepsin-soluble collagen in VCO- treated wounds was noticed indicating a higher collagen cross-linking. Glycohydrolase activities were also increased due to a higher turnover of collagen. Antioxidant enzyme activities, and reduced glutathione and malondialdehyde levels were found to have returned to normal levels on day 14 in the treated wounds. The lipid peroxide levels were found to be lower in the treated wounds. A histopathological study showed an increase in fibroblast proliferation and neovascularization in VCO-treated wounds compared to controls.^[7]

VCO shows moderate anti-inflammatory effects on ethyl-phenylpropiolate induced ear edema in rats and carrageenin and arachidonic-acid induced paw edema. VCO exhibited an inhibitory effect on chronic inflammation by reducing the transudative weight, granuloma formation, and serum alkaline phosphatase activity. VCO also showed a moderate analgesic effect on the acetic acid-induced writhing response as well as an antipyretic effect in yeast-induced hyperthermia. These results shows that VCO has anti-inflammatory, analgesic, and antipyretic properties.^[11] The mechanisms that lead to these effects are its ability to increase re-

epithelization, improved antioxidant enzymes activities and accelerate higher collagen cross-linking within the tissue being repaired.^[7]

Coconut is an easily available and highly consumed by the Indian population but there are only few studies supporting its benefits as a curative and preventive agent. It contains medium chain fatty acids (MCFAs). The predominant content is 45-50 percent lauric acid.^[8] Previous studies reported the effect of coconut oil pulling/oil swishing on plaque formation and plaque induced gingivitis. Despite of numerous properties and medical benefits of VCO, there are limited number of studies reporting effect of VCO on RAS.

Conclusion

VCO is effective in reducing ulcer size and relieving pain. Treatment using VCO is promising as it is easily available, safe and cost-effective treatment for RAS in developing countries like India where this product is available in abundance and more readily accepted by population as an integral part of their culture.

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Legend Tables

Table 1: Ulcer size from Day 1-Day 3

		Mean	Standard Deviation
Amlexanox	Day 1-Day 3-Size	22.2	10.73
Virgin Coconut oil	Day 1-Day 3-Size	17.5	6.29

Table 2: Ulcer size from Day 1-Day 5

		Mean	Standard Deviation
Amlexanox	Day1-Day 5-Size	29.4	16.94
Virgin Coconut oil	Day1-Day 5-Size	21.1	11.88

Table 3: Pain score from Day 1-Day 3

		Mean	Standard Deviation
Amlexanox	Day 1-Day 3-Pain	4	1.05
Virgin Coconut oil	Day 1-Day 3-Pain	4	0.94

Table 4: Pain score from Day 1-Day 5

		Mean	Standard Deviation
Amlexanox	Day 1-Day 5-Pain	4.7	1.25
Virgin Coconut oil	Day 1-Day 5-Pain	4.4	1.07