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Mouth Ulcer Management: Unveiling the Potency of Medicinal Herbs – A Review

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ABSTRACT:

Mouth ulcers, also known as oral or mucosal ulcers, are sores that form on the membranes of the oral cavity, characterized by a disruption in the mucosal surface. These ulcers, which involve the removal of dead or inflamed tissue, can cause discomfort and pain, often leading individuals to adjust their dietary preferences during the healing process. Among the various types of oral ulcers, aphthous stomatitis is the most prevalent, with many cases having unidentified causes despite their common occurrence. Symptoms such as redness, swelling, and bleeding commonly accompany the pain experienced in the affected area. The rising preference for herbal medicine over synthetic drugs is attributed to its lower incidence of side effects, leading to improved patient compliance. Herbal medicine plays a pivotal role in primary healthcare due to its widespread cultural acceptance, better compatibility with the body, and reduced risk of adverse reactions. This article examines popular herbal remedies and their efficacy in treating mouth ulcers.

1. Introduction

Mouth Ulcer:

Mouth ulcers, which are often uncomfortable, are mucosal sores commonly found on the lips, cheeks, tongue, or gums. [1]A mouth ulcer occurs when there is a disruption or damage to the mucous membrane located in the center of the mouth. It often presents as a sensation of pressure on the mucous membrane and can have a yellow or white appearance.[2] Mouth ulcers are prevalent, affecting approximately 5–20% of the general population. [3-5] Despite being benign and typically resolving on their own, the discomfort they cause can significantly disrupt daily activities such as speaking, eating, and drinking, impacting the patient's quality of life and work productivity. While the exact cause of mouth ulcers remains uncertain, they are believed to be associated with factors such as antigen sensitivity, genetic predisposition, hormonal fluctuations, mucosal health, nutritional deficiencies, and stress. [6]A twin study revealed that the occurrence of a latent form of mouth ulcers could be attributed to various factors, with a specific environmental component accounting for 10%, a common environmental factor for 26%, and a genetic factor for 64% of the observed variance. [7] Treating mouth ulcers focuses primarily on alleviating symptoms, promoting faster healing, reducing the size of ulcers, minimizing recurrence, and extending the time between episodes of illness. Current treatment options encompass a range of approaches, such as systemic and topical corticosteroids, antibiotics, vitamin B complex supplements, adhesives, topical antiseptics, pain relievers, anti-inflammatory medications, mouthwashes containing active enzymes, cautery, and photobiomodulation.[8].

Recurrent Aphthous Ulcer (RAU):

Mouth ulcers, commonly referred to as "aphthous ulcers," are the most prevalent oral mucosal condition in humans.[9] Recurrent aphthous stomatitis, also known as canker sores, typically emerges during childhood or adolescence.[10] Despite deriving from the Greek word "aphtha," which signifies ulcer, oral lesions are consistently labelled as aphthous ulcers in medical

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literature. Recurrent Aphthous Stomatitis (RAS) stands out as one of the primary pathological disorders causing ulcers in the oral mucosa.[11]

RAS appears as an erythematous halo and causes recurrent ulcers in the oral mucosa, either one or more. [12] According to epidemiologic research, the average prevalence is 17% of the population overall. [13-14]

Accurate diagnosis and management of potential etiologic variables are essential for efficacious treatment of aphthous stomatitis. Because of these widespread factors of which there are many none of the treatments have proven effective. It's unclear exactly what causes aphthous stomatitis.[15] Aphthous stomatitis is treated symptomatically, primarily with the help of empirical data.[16]

Types of mouth ulcer:

Mouth ulcers may be classified as minor, major, or herpetiform depending on their size and quantity. The primary classifications of oral ulcers comprise:

The primary classifications of oral ulcers comprise:

1. Minor ulcers:

Roughly 80% of cases consist of minor aphthous ulcers, which are the most prevalent type. They typically range in diameter from 2 to 8 mm and typically resolve within one to two weeks. These ulcers are generally shallow, occurring in small numbers, with a diameter not exceeding 1 cm, and they heal without leaving any scars.[17]

Figure 1. Minor ulcers

2. Major ulcers:

About 10% of individuals experience major aphthous ulcers, which is the second category. These have a raised or uneven border and are larger and deeper in shape, frequently measuring over 1 cm in diameter. [18] and they can appear as several lesions or as a single lesion. Because of the degree of necrosis, this kind of ulcer can leave a scar inside the mouth and take many weeks to heal.[19]

Figure 2. Major ulcers

3. Herpetiform ulcers:

These ulcers are a group of small ones, hardly bigger than a pinhead. Tiny ulcers, with a diameter of 2-3 mm, can form in large, asymmetric lesions that can fuse together in groups of 100 or more at once and stay scar-free for 7–10 days. [20-22]

Figure 3. Herpetiform ulcers

Causes of Mouth ulcers:

Mouth ulcers exact etiopathogenesis is not fully known.

Following are the causes of mouth ulcers: -

1.Genetic predisposition:

A genetic susceptibility accounts for about 40% of individuals with an early starts of serious ulcers and the family history of the ailments.[23]

2. Mechanical injury:

Recurrent aphthous ulcers may occur as a result of mechanical damage caused by dental procedures, sharp teeth, injections of local anaesthetic, and brush injuries.[24] Inadequate saliva, which fails to lubricate

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and shield the oral mucosa against trauma and exposure to antigens, may contribute to the onset of RAS.[25]

3. Microelement and vitamin B12 deficiencies:

Deficiencies in iron, folic acid, and vitamin B12 can each contribute to the development of RAS. Owing to the research group's varied genetic backgrounds and dietary habits, conflicting results about the link between hematinic insufficiency and RAS have been expanded in multiple studies.[26]

4. Stress:

Stress and psychological instability have been associated with recurrent aphthous ulcers. Patients frequently experience elevated stress levels when aphthous ulcers occur, and numerous studies have documented a heightened incidence. Fergusson et al. suggest that antidepressant medications can decrease the occurrence of ulcers.[27]

5.Food allergies:

Foods containing gluten, such as chocolate, coffee, almonds, tomatoes, cereals, peanuts, strawberries, cheese, and wheat flour, have the potential to cause arthritic ulcers.[28]

6. Smoking tobacco:

Individuals who do not smoke are frequently more susceptible to RAS, whereas heavy smokers are less likely to experience the most severe forms of the condition compared to moderate smokers. While some patients report regaining control over smoking, few mention that their RAS onset occurred immediately after cessation. The use of smokeless tobacco is associated with a notably reduced prevalence of RAS.[29]

7. Drugs:

Non-steroidal anti-inflammatory drugs (NSAIDs), such as diclofenac, propionic acid, and phenylacetic acid, may induce genital ulceration alongside mouth ulcers resembling RAU, or solely oral ulcers in the instance of piroxicam.[30]

8.Hormonal defects:

According to conflicting research findings, a minority of women with RAU exhibit cyclical oral ulcers that coincide with either the luteal phase of the menstrual cycle or the onset of menstruation.[31]

9. Microbial factor:

The belief that RAS is caused by an infectious agent lacks strong support from reliable data. Despite ongoing speculation regarding their potential involvement, current evidence suggests that none of these microbes are directly responsible for RAS. This includes investigations into suspected connections between previously implicated L forms of streptococci and RAS, as well as between adenoviruses, herpes simplex virus (HSV), varicella-zoster virus, and cytomegalovirus and RAS. Moreover, the argument for a viral cause of RAS is weakened by the fact that the antiviral drug acyclovir has not been shown to effectively prevent or reduce episodes of the condition. [32-33]

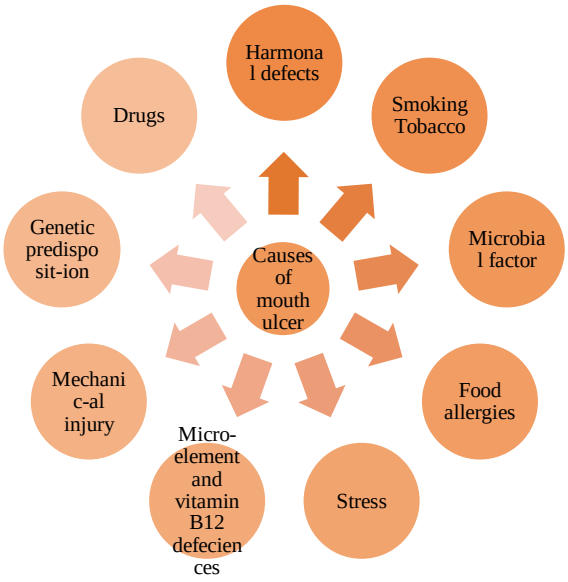

Figure 4: Causes of mouth ulcer

Sign and Symptoms:

Spotting mouth ulcers is simple. Usually, they manifest as sores on the tongue, inner cheeks, roof of the mouth, lips, or gums. Mouth ulcers are usually white, yellow, or Gray in the centre, with red rims. Additional signs and symptoms can be:

- The area around the ulcer swells.
- Pain that gets worse when you eat spicy, salty, or sour meals.

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- Increased pain when brushing your teeth.
- Tenderness causing issues when chewing or brushing teeth.
- Present as an excruciatingly painful oral ulcer.
- Emerge any place in the oral cavity.[34]

Herbal Medicine Importance:

A herb is a plant or plant part highly prized for its medicinal, aromatic, or flavorful properties. Think of herbs as natural chemical factories capable of producing a wide array of compounds. Herbal remedies or medicines are derived from various plant fragments or unpurified plant extracts containing a diverse range of ingredients that often interact synergistically.[35] Traditional or herbal medicine finds mention in ancient Indian, Chinese, Egyptian, Greek, Roman, and Syrian literature, such as the Rigveda, Atharvaveda, Charak Samhita, and Sushruta Samhita. Approximately 75–80% of the global population still relies on herbal medicine for primary healthcare, particularly in developing nations. Due to the misconception that herbal medications are inexpensive, readily available, and free of negative effects.[36] Despite the availability of contemporary drugs, herbal remedies have retained their significance due to socioeconomic, cultural, and historical aspects.[37] Herbalists and indigenous healers have long employed phytogenic substances in the prevention and treatment of ulcers. Flavonoids, which include quercetin, naringin, silymarin, anthocyanosises, and derivatives of sporadic, as well as saponins, gums, and mucilage's, are examples of botanical substances having anti-ulcer properties.[38]

Advantage of herbal medicine: [39,40]

Therapy for oral ulcers:

There are two main forms of treatment for mouth ulcers

1.Symptomatic relief:

There are numerous over-the-counter and prescription formulations that can be applied topically to relieve mouth ulcers and expedite their healing:

- Antiseptics are useful in treating and preventing infections linked to oral ulcers.
- To relieve pain, topical gels with anaesthetics such lidocaine and benzocaine are used.
- Using mouthwash containing chlorhexidine gluconate can shorten the ulcer's healing time.
- Tetracycline-containing antibiotic mouthwash aids in lessening ulcer size and related discomfort.
- To treat pain, people take oral medications like diclofenac.
- In severe ulceration situations, prescriptions are written for oral steroids and mouthwashes containing dexamethasone.
- Medication prescribed for stomach ulcers, like sucralfate, might offer some alleviation for oral ulcers.
- Ceremery, a type of mini-surgery on mouth ulcers to encourage healing, can be done with dental lasers.

2. Supportive care:

- Vitamin B complex deficits are treated with multivitamins or vitamin supplements.
- If there is a fever in addition to the ulcers, antipyretics such paracetamol may be given.
- In order to treat any concomitant illnesses, antibiotics may be recommended.[41]

Different forms of dosage for treating oral ulcers include:

- Pastes
- Mouthwashes
- Buccal tablet
- Buccal patch
- Medicated chewing gum
- Pharmaceutical Gel

Here are a few topical herbal treatments commonly utilized for managing mouth ulcers:

1.Zingiber offinale (Ginger)

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2.Ocimum sanctum (Tulsi)
3.Curcuma longa (Turmeric)
4.Psidium guajava (Guava)
5.Glycyrrhiza glabra (Liquorice)
6.Commiphora myrrh (Guggul)
7.Myrtus communis (Myrtle)
8.Matricaria chamomilla (Chamomile)
9.Punica granatum (Pomegranate)
10.Aloe barbadensis Miller (Aloe 0.5)
11.Allium sativum (Garlic)
12.Nicotiana tobacum (Tobacco)

Figure 6: The impact of topical herbs on the biology of mouth ulcers

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Table1.Evaluation of topical herbal medications for mouth ulcers in randomized research trials

No		/Extracts		Methods			
1.	Zingiber officinale (Ginger)	Ginger' s Alcoholic Extract	Anti-inflammatory Antinausea Digestion Aid Antioxidant Metabolism	Mucoadhesive gel	Double blind placebo-controlled trail of 15 patients for 20 min two times daily for 7 days	Pain severity significantly decreased, while ulcer size, affected area, and treatment duration showed no	Haghpanah et al.,[42]
2.	Ocimum sanctum (Tulsi)	Leaves Extract	Anti-inflammatory Antioxidant Antibacterial Analgesic Antiasthmatic Antidiabetic Immunomodulatory Hepatoprotective	Every morning for a duration of three weeks, consume a combination of fresh yogurt, five fresh Tulsi leaves, and one tablespoon of chewed and	A clinical study on 40-night shift workers of 30-60 years of age	In 29 patients, the recurrence of aphthous ulcers significantly decreased within four weeks.	Khuje et al. [43]
3.	Curcuma longa (Turmeric)	Dried rhizome Extract	Analgesic Anti-inflammatory Antiseptic Antioxidant Antibacterial Anticarcinogenic	Gel	In a randomized double-blind trial with 60 patients, Group A applied curcumin gel while Group B used Triamcinolone three	No significant differences in ulcer size, number, and duration were found between the groups.	Deshmukh et al.,[44]
4.	Psidium guajava (Guava)	Leaves Extract	Antioxidant Antibacterial Antifungal Antimicrobial Antitumor Anti-inflammatory	Mouthwash	In a randomized prospective open-label clinical study involving 32 aphthous patients, mouthwash was administered three times daily for a duration of 7 days.	The treatment group experienced significant pain relief and faster ulcer healing compared to the control group.	Guintu et al.,[45]

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Table2.Content continue

Sr. N	Scientific Name	Parts /Extracts	Properties	Preparation Methods	Study Design	Outcomes	Authors
5.	Liquorice extract (Glycyrrhiza glabra)	Root Extract	Antimicrobial Antioxidative Antidiabetic Antidepressive Anti-inflammatory Antithrombotic	Bio hydrogel patches (1%)	15 patients four times a day for 20 min for five days compared with placebo group	Compared to the placebo, the treated group showed significant decreases in pain score, inflammatory halo diameter, and necrotic center size	Moghadamnia et al.,[46]
6.	Commiphora Myrrha (Myrrh)	Stem Extract	Anti-inflammatory Antioxidant Antiseptic Immune boosting	Mucoadhesive gel	Five days of applying the gel four times daily was compared with both Aloe vera gel and a placebo gel	Noticeable decrease in pain for minor aphthous ulcers.	Mansour et al.,[47]
7.	Myrtus communis (Myrtle)	Leaves Extract	Antibacterial Analgesic Antioxidant Antihyperglycemic Anti-inflammatory	Paste	A randomized, double-blind, placebo-controlled clinical trial involving 45 patients, administered four times daily for six days.	Significant reduction in ulcer size, pain severity, erythema, and exudation level, with improved Oral Health Impact Profile.	Babee et al.,[48]
8.	Chamomilla (Matricaria Chamomilla)	Fluid extract	Antibacterial Antifungal Antiviral Analgesic Anti-inflammatory Antiviral	Chamomilla mouth rinse (tincture)	Triple-blind trial with 50 patients (25 in each group), receiving 10 drops three times weekly after initial doses on days 2, 4, and 6.	Improvements seen in lesion count, pain, burning sensation, healing time, and size after each visit.	Seyyedi et al., [49]

Table3.Content continue

Sr. No	Scientific Name	Parts/ Extracts	Properties	Preparation Methods	Study Design	Outcomes	Authors
9.	Punica granatum (pomegranate)	Flower/ peel Extract	Antibacterial Anti-inflammatory Antioxidant Antiproliferative	Water, alcoholic extracts of flower among three different varieties of Punica granatum as mouthwash	Double blinded 210 participants with comparison of three varieties of punicagranatum	p. granatum Var.pleniflora extract showed significant decrease in pain and time of recovery	Gavanji et al.,[50]
10.	Aloe (0.5%)	Leaves Extract	Antiviral Antibacterial Antifungal Anti-inflammatory Immunomodulatory Antioxidant Analgesic Antiseptic	Mucoadhesive gel	Five days of application with 4 times a day compared with myrrh and placebo gel	Significant reduction in ulcer size and highest reduction in erythema and exudation at day 6.	Mansour et al.,[51]
11.	Allivum Sativa	Bulb	Anti-inflammatory Antioxidant Immunomodulatory Wound Healing Antimicrobial	Mouth rinse	42 patients with minor RAS were randomly allocated into two groups of allicin mouth rinse 5 ml four times a day and allicin capsule 250 mg once daily for two months for 7 days with 6 months follow up	There was no statistical difference between the groups in regarding to ulcer size, pain and erythema	Nair et al.,[52]
12.	Nicotina tobacum	Leaves/ decoction	Antimicrobial Antioxidant Antifungal Antibacterial	Mouthwash	Randomized double-blinded placebo controlled clinical trial on 60 patients with 10 ml of mouthwash three times a day for 5 days.	Pain score and ulcer size were reduced than control group which was significantly greater than control group	Vaziri et al.,[53]

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