

A Review on Mouth Ulcer and their Herbal Remedies

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Abstract: *This review explores the types Mouth ulcers, often referred to as oral or mucosal ulcers, are a common and painful condition that affects the inner lining of the mouth. These small yet troublesome sores can interfere with daily activities like eating, speaking, and swallowing, significantly impacting an individual's quality of life. Mouth ulcers come in various forms, including aphthous ulcers, traumatic ulcers, and primary herpetic gingivostomatitis, each with distinct characteristics. They may arise due to factors such as trauma, nutritional deficiencies, infections, stress, or underlying autoimmune conditions. While conventional treatments provide symptomatic relief, there is growing interest in herbal remedies as safer and more natural alternatives. Time-tested herbal solutions such as aloe vera, turmeric, neem, honey, licorice root, and papaya have shown promising results due to their anti-inflammatory, antimicrobial, and soothing properties. These remedies not only alleviate pain but also promote faster healing and may address the root causes of ulcers. causes, symptoms, and treatment options for mouth ulcers, with a particular focus on herbal remedies. By shedding light on the potential of natural treatments, this study aims to offer alternative strategies for managing mouth ulcers effectively. Additionally, it highlights the importance of further research to validate these herbal approaches and integrate them into mainstream care.*

Keywords: Mouth ulcers, oral ulcers, herbal remedies, aphthous ulcers, natural treatment, aloe vera, turmeric, neem, oral health

I. INTRODUCTION

A mouth ulcer(also nominated an oral ulcer, or a mucosal Ulcer) is an ulcer that occurs on the mucous membrane of the oral cavity[1]. It's defined as " a break within the mucosal face of the oral cavity. " They're painful round or round Blisters that form in the mouth, substantially on the inside of the cheeks or lips[2].Ulcers are an open sore of the skin or mucus membrane characterized by removing of inflamed dead towel. There are numerous feathers of ulcer like mouth ulcer, esophagus ulcer, ulcer, and genital ulcer. Ulcers are commonest on the skin of the lower extremities and within the alimentary tract, although they will be encountered at nearly anypoint[3].Oral ulcers are common symptoms in the oral cavity and can be traumatic, infectious, aphthous ulceration due to dermatoses, medicine- convinced ulceration as a marker of systemic complaint, or nasty ulceration[4].They're common and can be due to original factors like trauma from dentures or fractured dentition or a limit less number of systemic conditions can manifest as ulcerations within the oral cavity[5]. Mouth ulcers are veritably common, and they do in association with numerous conditions and by different mechanisms, but generally there's no serious beginning cause[6]. Oral trauma is one of the foremost common causes of intermittent oral ulcers. This results in Mechanical, chemical, or thermal vexation of the mucosa. These are generally acute short- lived events producing painful ulcers, which heal fluently within some weeks without scar. The Ulcers could indeed be intermittent if the inciting encouragement is not removed. Mouth ulcer causes Pain during eating, drinking and thru brushing teeth[7]. Common causes of mouth ulcers Include nutritive scarcities similar as iron, vitamins especially B12 and C, poororal hygiene, infections, stress, indigestion, mechanical injury, food disinclinations, hormonal imbalance, skin complaint etc. Mouth ulcers, Also known as aphthous ulcers[8].Ulcers are most common in the oral cavity, for which the case sees a croaker or a dentist. The most common complaints are greenishness, a burning sensation, and pain. They can be set up in any part of the oral depression, but they're most painful when they do in the portable area.



Figure No 1: Mouth ulcer

Ulcers are classified as acute(short term) or chronic(long term) grounded ontheir duration.Acute ulcers, similar as traumatic ulcers, aphthous ulcers, herpetic ulcers, andchancres, last no more than three weeks before healing on their own. Chronic ulcers,similar as major aphthous ulcers.Ulcers from odontogenic infection, nastyulcers, gumma ulcerssecondary to systemic complaint, and some traumatic ulcers, last for weeks or months. A common clinical complaint is An oral mucosal ulcer[9].

Patients who visit the outpatient department frequently complain about oral ulcers. Aphthous ulcers are the most prevalent type, affecting up to 25% of the global population, while the estimated point prevalence of oral ulcers is 4%[10].With a range of 5–66% across different countries, the prevalence of aphthous varies significantly among populations and age categories[11-12].Females (56.3%) were morefrequently affected than males (43.7%) and this difference was statistically significant ($p < 0.005$). The results were similar to the findings of Safadi[13].Females are more prone to stress and emotional situations which can affect their immune response. They seek medical examination more frequently than males. The hormonal changes during pregnancy and menstruation also play a role[14].

PATHOPHYSIOLOGY

The cause determines the precise pathophysiology.

Simple mechanisms that make the mouth more vulnerable to stress and ulceration include epithelial atrophy (thinning, such as after radiation therapy) and xerostomia (dry mouth), which makes the lining more brittle and readily penetrated because saliva normally lubricates the mucous membrane and regulates bacterial levels.Stomatitis is a broad word for oral inflammation, which is frequently linked to ulceration[15].

Since the mouth serves as a pathological transition between the gastrointestinal tract and the skin, it may be affected by a variety of gastrointestinal and cutaneous disorders. Orofacial granulomatosis and oral Crohn's disease are two examples of illnesses that typically affect the entire gastrointestinal system but only manifest in the mouth[15].

In a similar vein, cutaneous (skin) disorders can sometimes affect the mouth, and occasionally just the mouth, leaving the skin unaffected. Certain cutaneous illnesses that cause distinctive lesions on the skin only cause nonspecific lesions in the mouth due to various environmental factors (saliva, thinner mucosa, trauma from teeth and food)[16].

certain cutaneous problems can result in only nonspecific lesions in the mouth result from unique lesions on the skin. The vesicles and bullae of blistering mucocutaneous illnesses rapidly develop into oral ulcers due to moisture and stress from food and teeth. Ulcers may develop into secondary infections due to the mouth's high bacterial load. Chemotherapy cytotoxic medicines target cancer cells and other cells with high turnover rates. Oral ulceration, or mucositis, is a frequent side effect of chemotherapy due to the high turnover rate of the oral epithelia[16].

Because the underlying lamina propria is visible, erosions that affect the epithelial layer look red. The lesion turns yellow-grey and is covered in fibrinous exudate when the entire thickness of the epithelium is broken through (ulceration). An ulcer appears as a crater in cross section because it is a rupture of the usual lining. There can be a "halo"—a reddening of the surrounding mucosa brought on by inflammation. Oedema or swelling, around the ulcer is another possibility. An ulcer with a keratotic (white, thicker mucosa) edge may resultfrom chronic trauma[16].

Repeated episodes of mouth ulcers may indicate immunodeficiency, due to low levels of immunoglobulins in the oral mucosa. Chemotherapy, HIV, and mononucleosis are all causes of immunodeficiency/immunosuppression and mouth ulcers are a common symptom.

Autoimmunity can also result in oral ulcers. An autoimmune response against the epithelial basement membrane called mucous membrane pemphigoid causes desquamation or ulceration of the oral mucosa. An inflammatory autoimmune condition called Behçet's disease may be indicated by a high number of aphthous ulcers. Later on, this may result in

uveitis in the eyes and skin lesions. Vitamin C deficiency can lead to scurvy by preventing wounds from healing and perhaps causing ulcers[17].

Classification of mouth ulcer:-

1. Recurrent Aphthous Stomatitis (Canker sore):-

Mouth ulcers are also known as “aphthous ulcers”. The most common oral mucosal diseases in humans, recurrent aphthous stomatitis, usually begins to appear in childhood or adolescence



Figure No 2: Recurrent Aphthous Stomatitis

and is also known as aphthous ulcers or canker sores. Since “aphthous” comes from the Greek word “aphtha”, which suggests an ulcer, the medical literature continues to refer to these oral lesions as aphthous ulcers[18-19]. A round, often painful sore inside the mouth that is white or gray with a red border; tingling or burning sensation prior to sore development; aphthous ulcers appear in round or oval shape, with a grayish yellow, bowl-shaped form of a bowl surrounded by inflamed mucosa[20]. Areas of keratinized oral mucosa, such as the surface, the gums, and the dorsal surface of the tongue, are common locations for ulcers, which typically occur on the non-keratinized oral mucosa inside the mouth, including the lips, buccal mucosa, bottom of the mouth, and thus the ventral surface of the tongue. Local lesions, genetic factors, nutritional deficiencies, viral and bacterial infections, and immune or endocrine disruptions have been identified as etiological factors in common oral ulcers[21-22].

1) Minor ulcer :-

Minor aphthous ulcers are the foremost common form considering for about 80% of cases. These are around 2-8mm in diameter and they usually clear up in 10 days to 2 weeks. Typically, these ulcers are superficial in nature, small in size, usually but 1 cm in diameter, few in number, occurring singularly or in groups, and heal without scarring[23].

2) Major ulcer :-

The second type is major aphthous ulcers. It occurs in about 10% of patients. These are bigger and deeper in shape often over 1cm in diameter, with a raised or irregular border. They occur either singly or as multiple lesions. This type of ulcer can take several weeks to heal and may leave a scar in the mouth[24].

3) Herpetiform ulcers:- Named for the lesions connected to herpes, herpetiform ulcers are a particular kind of aphthous ulcer. HU is not contagious like herpes. Since HU ulcers heal quickly, it may seem as though there will never be any improvement. This kind of ulcer is made up of dozens of tiny, pinhead-sized ulcers. These have a diameter of two to three millimetres.



Figure No 3: Herpetiform ulcer

Lesions can join together to form large irregular ulcers. These ulcers typically last 10-14 days[25].

B) Traumatic ulcer:-One of the most common types of ulcer is a traumatic ulcer, which is acute in nature. Physical, thermal, or chemical trauma to the oral mucosa is usually the cause of ulcers. Injury to the Oral mucosa may give result from accidental self-biting, dental procedures, tooth brush bristles, and sharp-edged Foods (e.g., potato chips), anesthetic injection. Thermal burns are most commonly caused by hot food Or beverages such as pizza, coffee, or tea, or by a heated dental instrument during a dental Procedure[27].



Figure no 4 : Traumatic ulcer

C) Leukoplakia

White patches that appear in the mouth are a symptom of leukoplakia. The spots are not painful, but they won't go away if you rub them. If something irritates the inside of your mouth, you may develop leukoplakia. Because leukoplakia can progress to oral cancer, your dentist may refer you to a specialist for diagnosis and treatment. Gums with leukoplakia develop thick, white patches. Additionally, the insides of the cheeks and the bottom of the mouth may develop the patches. On the tongue, the patches can occasionally appear. You can't scrape these patches off. Leukoplakia patches are typically not cancerous. However, some patches exhibit early cancer symptoms. Areas of leukoplakia may be next to oral cancers. Speckled leukoplakia,

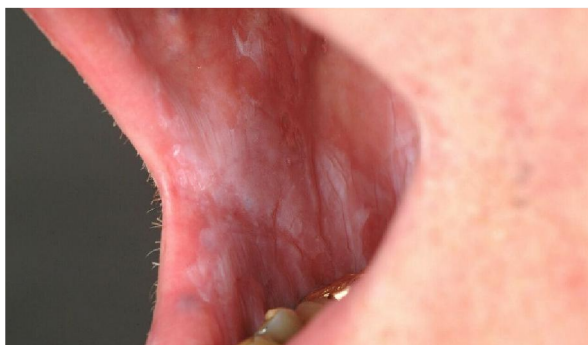


Figure no 5: Leukoplakia

which is characterised by red and white patches, may be a sign of a cancer. Mouth sores or white spots that don't go away on their own in two weeks. It's best to see your dentist or doctor if you have any changes in your mouth then consult with doctor or physician. A type of leukoplakia in the mouth called hairy leukoplakia mainly affects people whose immune systems have been weakened by disease, especially HIV/AIDS[28-29].

D) Erythroplakia:-

The mucosal membranes of your mouth are impacted by erythroplakia. It results in white patches (leukoplakia) that may accompany red lesions (spots). Erythroplakia may be benign or malignant. Erythroplakia is most frequently caused by smoking and chewing tobacco.

Doctor will probably take a biopsy to decide on treatment. Erythroplakia can occur in anyone. However, those who smoke or chew tobacco are more likely to have it.

Additionally, those over 40 are more likely to be affected. In the United States, erythroplakia affects around 1 in 2,500 adults, making it less frequent than leukoplakia[30-31].



Figure no 6 : Erythroplakia

E) PRIMARY HERPETIC GINGIVOSTOMATITIS: -The most common oral manifestation of herpes simplex virus (HSV) infection is primary herpetic gingivostomatitis. HSV-1 is responsible for more than 90% of cases occurring above the waist.

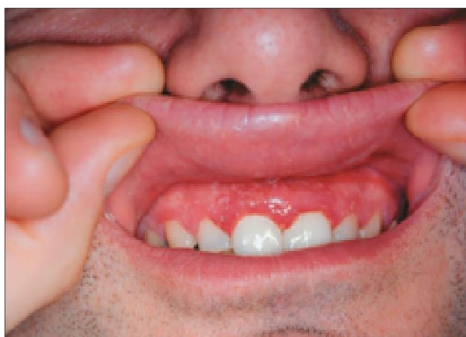


Figure no 7 : Primary Herpetic Gingivostomatitis

HSV-2 infection occurs below the waist[32]. HSV-1 (Herpes Simplex Virus Type 1) is a common virus that primarily causes oral infections like cold sores or blisters around the lips, inside the mouth, or on the face. It spreads easily through direct contact, such as kissing, sharing utensils, or using the same towels or lip balm. Most people contract it during childhood, particularly between ages 1 and 5. In young children, the first infection often appears as primary herpetic gingivostomatitis, causing fever, sore throat, and painful blisters. While HSV-1 mainly spreads through oral contact, it can also spread through oral-genital contact, leading to genital herpes in some cases[33]. HSV-2 (Herpes Simplex Virus Type 2) is a virus that mainly causes genital herpes and is most often spread through sexual contact. It can lead to symptoms like pain, swelling, irritation, and blisters in the genital area.

CAUSES OF MOUTH ULCER:

1) Inheritable factors :-

There's an inheritable element in cases with aphthous ulcers, with about 30- 40 of cases having a family history. A family history of intermittent aphthous ulcers is egregious in some cases. A familiar Connection includes a youthful age of onset and symptoms of increased inflexibility. Intermittent aphthous ulcers are largely identified in identical halves[34].

2) Physical or Psychological Stress:-

There's a strong connection of aphthous ulcer circumstances with stressful life. Cerebral stress may play a part in the appearance of intermittent aphthous stomatitis as a detector or a modifying factor. No studies have convincingly proved stress as a causative or pouring factor for intermittent aphthous stomatitis[35].

3) Trauma:-

The most likely factors which bring about aphthous ulcers are original trauma and stress. Injury to the oral mucosa may give result from accidental tone- biting, dental procedures, tooth encounter bristles, and sharp-edged Foods(e.g.,

potato chips), anesthetic injection. Piecemeal from this environmental and emotional stress also affect into aphthous ulcer[36].

4) Food allergies

There are colorful food which is suitable to beget disinclinations. Antibodies to cow's milk and wheat Protein(celiac complaint) are demonstrated in cases with intermittent aphthous stomatitis. Thus, numerous foods that are generally allergenic(e.g., strawberries, tomatoes, and nuts) have not been causally associated with intermittent aphthous stomatitis. Foods like chocolate, coffee, Peanuts, cereals, almonds, strawberries, rubbish, tomatoes(indeed the skin of the tomatoes) and flour(containing Gluten) could indeed be intertwined in some cases[37].

5) Nutritive insufficiency

Colorful nutritive scarcities have been intertwined in a subset of aphthous ulcer cases, which involving of iron, folic acid, vitamin B12, B1, B2 and B6. The donation of nutritive scarcities to aphthous ulcers are likely to vary across different regions grounded on diet and food supplementation[38].

6) Immune diseases

Aphthous ulcers are more common And more severe in cases with vulnerable diseases, Including cyclic neutropenia, seditious bowel Disease, Behçet's complaint, and HIV complaint[39].

7) Tobacco smoking

The cases suffering from intermittentaphthous stomatitis generally arenon-smokers, but there's a lower frequency and inflexibility of intermittent aphthous stomatitis among heavy smokers as critical moderate Smokers. Some cases report an onset of intermittent aphthous stomatitis after smoking conclusion, while others Report control onre-initiation of smoking. The use of smokeless tobacco is expounded to a significantly lower frequency of intermittent aphthous stomatitis. Nicotine- containing tablets also appear to control the frequency of intermittent aphthous stomatitis[40].

8) Specifics

Some specifics, including Non SteroidalAnti-inflammatory Drugs(NSAIDs), beta- blockers, or chemotherapy, can beget or worsen mouth ulcers as a side effect[41].

9) Infections:- Viral infections(similar as the herpes simplex contagion) or bacterial infections can lead to mouth ulcers.

10). Hormonal Changes:-

Hormonal oscillations, particularly during period, gestation, or menopause, can increase the threat of developing mouth ulcers[42].

SIGN AND SYMPTOMS:-

The symptoms of a mouth ulcer depend on the cause, but may include

- I).One or further painful blisters on part of the mucous membrane lining the mouth.
- II) and red mucous membrane around the blisters.
- III)Problems with chewing or tooth brushing because of the tenderheartedness. aggravation of the blisters by salty, racy or sour foods.
- IV)Aggravation of the blisters by dentures, orthodontic aligners or mouth slivers.
- V) occasions an ulcer may not be sore. This can do in cases of mouth cancer
- VI)Tenderheartedness causes difficulty biting or brushing teeth.
- VII)Salty, racy, or sour foods irritate the blisters.
- VIII) Aphthous ulcers are most generally set up on the softer mouth filling of the lips, cheeks, Sides of the lingo, bottom of the mouth, back of the roof of the mouth, and around the Tonsil area. These ulcers are generally no larger than 5 mm in radius. You can have further than one aphthous ulcer at a time, and these ulcers can occasionally be joined together[44].

TREATMENT:-

Almost mouth ulcers are generally inoffensive and resolve by themselves within 10 to 14 days.

Treatment options for mouth ulcers include

- Avoid racy, salty and sour foods until the ulcers heal.

- plenitude of fluids.
- your mouth clean.
- wash your mouth out with warm, slightly interspersed water, keeping the wash in your mouth for over to 4 twinkles at a time. Repeat four times daily.
- Use an alcohol-free treated(rather containing chlorhexidine gluconate) mouthwash doubly daily[45].
- Use a topical alcohol-free steroid mouthwash or ointment – this is generally specified by your dentist or oral drug specialist.
- A topical analgesic(for illustration, BENZYDAMINE mouthwash) to palliate pain.
- To reduce inflammation, topical(gels, creams, or inhalers) or systemic steroids may be used.
- An antifungal drug may be used to help the development of oral candidiasis in People who use steroids for an extended period of time.
- Vitamin B12 has been shown to be effective in treating recreating ulcers[46].

HERBAL REMEDIES TO CURE MOUTH ULCER :-

1) Aloe vera :-

An all-natural treatment for mouth ulcers is aloe vera. Its antimicrobial, immunostimulant, and anti-inflammatory therapeutic qualities aid in reducing pain and inflammation and rapid the healing process. On the mouth ulcer, apply the gel that was taken out of the fresh aloe vera leaf. Do this multiple times a day. Aloe vera juice can also be used three or four times a day to rinse your mouth. Aloe vera calms and covers the ulcer with a cool, moisture-retaining covering that relieves pain and discomfort[47].

2) Tulsi:-

Tulsi (*Ocimum sanctum*), a stimulant in Ayurveda, reduces psychological stress by enhancing memory, cognitive function, and acting as an anxiolytic and antidepressant. It alleviates metabolic stress by normalizing blood pressure, cholesterol, and glucose levels. Described as fragrant and antipyretic, tulsi relieves kapha and vata but may aggravate pitta. It functions as a cough reliever, sweat inducer, and remedy for anorexia and dyspepsia. Rich in phenolic compounds like apigenin and eugenol (71% in leaves), tulsi exhibits strong antioxidant properties. Its extracts eliminate over 99% of oral bacteria, helping treat ulcers and prevent tartar, plaque, cavities, and bad breath. With 0.7% volatile oil and 20% methyl eugenol, tulsi supports oral and overall health effectively[48].

3) Neem:-

Neem (*Azadirachta indica*) is a medicinal tree with antiseptic, antibacterial, and anti-inflammatory properties, effective in reducing pain, inflammation, and promoting healing. Its antimicrobial activity inhibits microbial growth and aids cell wall degradation. For canker sores, mix 1 teaspoon of neem churna (powder) with water to form a paste, apply it to the sore for 10–15 minutes, then rinse thoroughly. Repeat 2–3 times daily. Alternatively, prepare a neem water rinse by steeping neem leaves in hot water, cooling, and straining. Use as a mouthwash, swishing for 30–60 seconds before spitting out. Repeat 2–3 times daily. Neem-based mouthwashes combat bacteria like *Streptococcus mutans*, helping treat ulcers, bad breath, and oral infections[49].

4) Liquorice :- (Mulethi)

Liquorice, or Yashtimadhu in Ayurveda, is a herb with strong anti-inflammatory and anti-ulcer properties, making it effective for treating mouth ulcers. Its root contains triterpenoid saponins, primarily glycyrrhizin, a potassium and calcium salt of glycyrrhizic acid. Saponins help relieve pain and promote healing, while glycyrrhizin reduces ROS production, a key factor in inflammation. Liquorice root extract is available as an oral patch, offering a targeted solution for canker sores and ulcer-related discomfort.

Liquorice Paste: Mix 1 teaspoon of liquorice powder with a few drops of water to form a paste. Apply it to ulcers, leave for 15–20 minutes, and rinse with water. Repeat 2–3 times daily.

Liquorice Mouthwash: Boil 1 teaspoon of liquorice powder in a cup of water for 5 minutes, cool, and strain. Gargle with the solution for 30–60 seconds, ensuring it reaches affected areas, then spit and rinse with plain water. Use 2–3 times daily[50].

5) Ghee :-

Ghee has many uses outside of cooking, as it has long been valued as a medicinal ingredient in Ayurveda. Sit down and read about this essential medicinal food, whether you are a ghee enthusiast or just starting out. Ghee, when used properly, is one of the most medicinal Ayurvedic compounds. Due to its ability to reduce swelling, ghee is a common remedy for mouth ulcers. Simply use a small amount of pure, unadulterated ghee with your fingers to apply ghee to the ulcers. Let it sit for a few minutes, then rinse your mouth with unscented water. At least twice a day, do this practice. Cow ghee contains antioxidants. It is useful for skin treatment due to its antibacterial, anti-inflammatory and antiseptic qualities. Semi-solid compounds called ointment bases are applied to the skin or mucous membrane. When used outside the body[51-52].

6) Honey :-

Honey is highly effective in treating wounds, burns, and ulcers due to its antioxidant, antibacterial, and anti-inflammatory properties. It retains moisture, speeds up healing, and protects against infections. Honey contains antimicrobial agents like Bee defensin-1, methylglyoxal, and hydrogen peroxide, which help heal open wounds, including canker sores, while its high sugar content eliminates bacteria through osmosis. To use, dip a cotton swab in honey and apply it to the affected area. For scars, apply a small amount and leave it on for a few minutes. For best results on wounds, reapply honey every few hours. Honey is a natural remedy for various ailments, promoting faster recovery[53].

7) Papaya :-

For a few minutes, place a fresh papaya slice on the ulcer. Enzymes like papain, which are found in papaya, can aid in inflammation and healing. It's essential to consume papaya while chewing it well to prevent mouth sores. Enzymes that break down proteins are released into the oral cavity and make their way to the exposed, inflamed surfaces of the sores[52].

8) Chewing coconut :-

Consuming soft coconut water helps the body chill down. Chewing some fresh or dried coconut or applying a tiny bit of coconut oil directly to the mouth ulcer both help to reduce pain and inflammation and speed up the healing process. Three products from the coconut tree—dry coconut, coconut oil, and coconut water—can aid in the treatment of mouth ulcers. Mouth ulcers can cool down thanks to the soothing and cooling properties of coconut milk. For this, please use cold coconut milk. To ease the agonising agony of ulcers, gargle with coconut milk twice or three times a day. It lessens pain and redness in the surrounding area due to its superior anti-inflammatory qualities. Apply liberal amounts of coconut oil to the afflicted area using a piece of cotton cloth. Apply toothpaste to the affected area with your finger. Although it may cause some discomfort, this remedy is extremely effective[53].

II. CONCLUSION

Mouth ulcers are a common issue that many of us face, causing discomfort and making everyday activities like eating or talking challenging. These small sores can result from various factors, such as stress, minor injuries, nutritional deficiencies, or even autoimmune conditions. While typically not serious, they can significantly affect our quality of life[54].

Conventional treatments provide relief, but natural remedies have been a trusted approach for generations. Ingredients like aloe vera, turmeric, honey, neem, and licorice root are known for their soothing, anti-inflammatory, and healing properties. These herbal options are not only effective but also affordable and easy to access, making them a great complement to traditional treatments[55].

In conclusion, mouth ulcers, though minor, can cause major inconvenience. By understanding their causes and incorporating simple, natural remedies, we can manage the pain and promote healing, ensuring a quicker return to comfort and well-being[56].

REFERENCES

- [1]. Yogesh S. Thorat, Asha M. Sarvagod, Shital V. Kulkarni, Avinash H. Hosmani. Treatment of Mouth ulcer by Curmcumin loaded Thermoreversible Mucoadhesive gel. International Journal of Pharmacy and Pharmaceutical sciences.2015;7(10):399-402.
- [2]. Mark, Anita M. "The basics of mouth sores." Journal of the American Dental Association (1939) vol. 153,10 (2022): 1014. Doi:10.1016/j.adaj.2022.07.010
- [3]. Debjit B, Chiranjib C, Tripathi KK, Pankaj Sampath Kumar KP. "Recent trends of treatment and medication Peptic ulcerative disorder," International Journal of Pharm Tech Research 2010;2(1):970-980.
- [4]. MS, Glick M and Ship JA: Burket's Oral Medicine, 2008.
- [5]. Scully C, Shotts R. ABC of oral health. Mouth ulcers and other causes of orofacial soreness and pain. BMJ 2000;321:162-165.
- [6]. Hina handa; a brief review on classification of oral ulcerative lesions, Journal of oral medicine, oral surgery, oral pathology and oral radiology, 2021.
- [7]. Budtz-Jorgensen E. Oral mucosal lesions associated with the wearing of removable dentures. J Oral Pathol 1981;10:65-80.B. Niyaz Basha, Kalyani Prakasam, Divakar Goli
- [8]. Formulation and evaluation of Gel containing Fluconazole- Antifungal Agent. International Journal of Drug Development & Research .2011;3(4):109-128.
- [9]. Dr. Ashwini kerai, recurrent mouth ulcers, 2019.
- [10]. Shulman, Jay D et al. "The prevalence of oral mucosal lesions in U.S. adults: data from the Third National Health and Nutrition Examination Survey, 1988-1994." Journal of the American Dental Association (1939) vol. 135,9 (2004): 1279-86. Doi:10.14219/jada.archive.2004.0403
- [11]. Pongissawaranun, W, and P Laohapand. "Epidemiologic study on recurrent aphthous stomatitis in a Thai dental patient population." Community dentistry and oral epidemiology vol. 19,1 (1991): 52-3. Doi:10.1111/j.1600-0528.1991.tb00106.x
- [12]. Porter, S R et al. "Recurrent aphthous stomatitis." Critical reviews in oral biology and medicine : an official publication of the American Association of Oral Biologists vol. 9,3 (1998): 306-21. Doi:10.1177/10454411980090030401
- [13]. Safadi, Rima Ahmad. "Prevalence of recurrent aphthous ulceration in Jordanian dental patients." BMC oral health vol. 9 31. 22 Nov. 2009, doi:10.1186/1472-6831-9-31.
- [14]. Zain, R B. "Oral recurrent aphthous ulcers/stomatitis: prevalence in Malaysia and an epidemiological update." Journal of oral science vol. 42,1 (2000): 15-9. doi:10.2334/josnusd.42.15.
- [15]. Suomalainen A, Tornwall J and Hagstrom J: CT findings of necrotizing J Dent & Oral Disord., 2012.
- [16]. Munoz-Corcuera M, Esparza-Gomez G, Gonzalez-Moles MA and Bascones-Martinez A: Oral ulcers: clinical aspects. A tool for dermatologists. Part I. Acute ulcers. Clin Exp Dermatol., 2009.
- [17]. Michael a o lewis, oral ulceration: causes and management, The pharmaceutical journal,2019.
- [18]. Stoopler ET and Musbah T: Recurrent aphthous stomatitis.CMAJ: Can Med AssocJ.,2013.
- [19]. Jurge, S et al. "Mucosal disease series. Number VI. Recurrent aphthous stomatitis." Oral diseases vol. 12,1 (2006): 1-21. Doi:10.1111/j.1601-0825.2005.01143.x
- [20]. Neville BW, Damm DD, Allen CM, Bouquot JE (2008). Oral & maxillofacial pathology (3rd ed.). Philadelphia: W.B. Saunders. Pp. 331-36. ISBN 978-1-4160-3435-3.
- [21]. Preeti, L et al. "Recurrent aphthous stomatitis." Journal of oral and maxillofacial pathology : JOMFP vol. 15,3 (2011): 252-6. doi:10.4103/0973-029X.86669
- [22]. Graykowski, E A. "Recurrent aphthous stomatitis." Modern treatment vol. 4,3 (1967): 565-71.
- [23]. Woo SB, Sonis ST. Recurrent aphthous ulcers: a review of diagnosis and treatment. J Am Dent Assoc. 1996;127:1202-13
- [24]. Akintoye SO, Greenberg MS. Recurrent aphthous stomatitis. Dent Clin North Am. 2014 Apr;58(2):281-97. Doi: 10.1016/j.cden.2013.12.002. Epub 2014 Jan 21. PMID: 24655523; PMCID: PMC3964366.
- [25]. Chung JY, Ramos-Caro FA, Ford MJ, et al. Recurrent scarring ulcers of the oral mucosa. Arch Dermatol 1997;133:1162-3.

- [26]. Purushotham K. Rao D, Vijaybhaskar S, Pratima. Formulation of topical oral gel for the treatment of oral sub mucous fibrosis. Scholars Research library.2011;3(1):103-112
- [27]. Capella, Diogo Lenzi et al. "Proliferative verrucous leukoplakia: diagnosis, management and current advances." Brazilian journal of otorhinolaryngology vol. 83,5 (2017): 585-593. Doi:10.1016/j.bjorl.2016.12.005
- [28]. Chaturvedi, Anil K et al. "Oral Leukoplakia and Risk of Progression to Oral Cancer: A Population-Based Cohort Study." Journal of the National Cancer Institute vol. 112,10 (2020): 1047-1054. Doi:10.1093/jnci/djz238
- [29]. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. Int J Cancer 2010; 127: 2893–2917.
- [30]. Holmstrup, P. "Oral erythroplakia-What is it?." Oral diseases vol. 24,1-2 (2018): 138-143. Doi:10.1111/odi.12709
- [31]. Reichart, Peter A, and Hans Peter Philipsen. "Oral erythroplakia—a review." Oral oncology vol. 41,6 (2005): 551-61. Doi:10.1016/j.oraloncology.2004.12.003.
- [32]. Mohan RPS, Verma S, Singh U and Agarwal N: Acute primary herpetic gingivostomatitis. BMJ Case Reports, 2013.
- [33]. Heliotis, Isabelle et al. "Primary herpetic gingivostomatitis in children." BMJ (Clinical research ed.) vol. 375 e065540. 31 Dec. 2021, doi:10.1136/bmj-2021-065540
- [34]. Redman RS. Recurrent oral ulcers. Northwest Dent 1972;51:232-4.
- [35]. Abolfazl Aslani, Behzad Zolfaghari, Fatemeh Davoodvandi. Design, Formulation and Evaluation of an oral gel from Punica Granatum Flower extract for the treatment of Recurrent Aphthous Stomatitis. Advanced Pharmaceutical Bulletin 2016;6(3):391-398.
- [36]. Ambikar RB, Phadtare GA, Powar PV, Sharma PH. Formulation and Evaluation of the Herbal oral Dissolving film for treatment of Recurrent Aphthous Stomatitis. International Journal of Phytotherapy Research2014;4(1):11-18.
- [37]. Niyaz Basha B, Kalyani Prakasam, Divakar Goli. Formulation and evaluation of Gel containing Fluconazole-Antifungal Agent. International Journal of Drug Development & Research 2011;3(4):109-12
- [38]. Mohsin J Jamadar, Rajmahammad Husen Shaikh. Preparation and evaluation of herbal gel formulation. Journal of Pharmaceutical Research and Education2017;1(2):201-224.
- [39]. Abdullah MJ. Prevalence of recurrent aphthous ulceration experience in patients attending Piramird dental speciality in Sulaimani City. J Clin Exp Dent2013;5:e89e94.30.
- [40]. Miller MF, Garfunkel AA, Ram C, Ship II. Inheritance patterns in recurrent aphthous ulcers: twin and pedigree data. Oral Surg Med Oral Pathol 1977;43(6):886-91.
- [41]. Huling LB, Baccaglini L, Choquette L, Feinn RS, Lalla RV. Effect of stressful life events on the onset and duration of recurrent aphthous stomatitis. J Oral Pathol Med. 2012;41:149-152.
- [42]. Camila de Barros Gallo, Maria Angela Martins Mimura, Norberto Nobuo Sugaya. Psychological stress and recurrent aphthous stomatitis. Clinics 2009;64(6):645648.
- [43]. Volkov I, Rudoy I, Freud T et al. Effectiveness of Vitamin B12 in treating recurrent aphthous stomatitis: a Randomized, double-blind, placebo-controlled trial. J Am Board Fam Med 2009;22:9-16
- [44]. BW, Damm DD, Allen CM and Bouquot JE: Oral and Maxillofacial Pathology,2002.
- [45]. Roberts C: Genital herpes in young adults: changing sexual behaviors, epidemiology and Management. Herpes, 2005.
- [46]. Femopase FL, Hernandez SL, Gendelman H, Criscuolo MI and Lopez-de-Blanc SA: Necrotizing Sialometaplasia: report of five cases. Medicina Oral., 2004.
- [47]. Zou, Hang et al. "Effects of Aloe Vera in the Treatment of Oral Ulcers: A Systematic Review and Meta-Analysis of Randomised Controlled Trials." Oral health & preventive dentistry vol. 20 509-516. 12 Dec. 2022, doi:10.3290/j.ohpd.b3666483
- [48]. Baharvand M, et al. Herbs in oral mucositis J Clin Diagn Res., 2017.

- [49]. Mittal S, et al. A review: herbal remedies used for the treatment of mouth ulcer. Int J Heal And Clin Res., 2019.
- [50]. Liu, Hsin-Li et al. "Effective licorice gargle juice for aphthous ulcer pain relief: A randomized double-blind placebo-controlled trial." Pakistan journal of pharmaceutical sciences vol. 35,5 (2022): 1321-1326.
- [51]. Agnihotri A, et al. Oral Ulceration and Indian Herbss: A Scoping Review. Dent J Adv Stud., 2020.
- [52]. Baharvand M, et al. Herbs in oral mucositis J Clin Diagn Res., 2017.
- [53]. Agnihotri A, et al. Oral Ulceration and Indian Herbss: A Scoping Review. Dent J Adv Stud., 2020.
- [54]. J.A., & Chavez, E.M. (2000). Management of recurrent aphthous stomatitis. Journal of the American Dental Association, 131(4), 511-520.
- [55]. Chopra, A., Doiphode, V.V. (2002). Ayurvedic medicine: Core concept, therapeutic principles, and current relevance. Medical Clinics of North America, 86(1), 75-89.
- [56]. Porter, S.R., & Scully, C. (2002). Oral mucosal disease: Recurrent aphthous stomatitis. British Journal of Oral and Maxillofacial Surgery, 40(5), 395-404.
- [57]. <https://images.app.goo.gl/rHmhcA4BqHjqxn9Y9>
- [58]. <https://images.app.goo.gl/2hbXYUT9dREckm4h7>
- [59]. <https://images.app.goo.gl/paqcdEPzZTz7bAUt9>
- [60]. <https://images.app.goo.gl/ksCA6qzoLKvop8ku9>
- [61]. <https://images.app.goo.gl/yEawXyPgHhNSrRcB6>
- [62]. <https://images.app.goo.gl/7cokzKA9QCA8Kvby6>
- [63]. <https://images.app.goo.gl/sdm4wzoikmSJcQYd6>