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Communication, Information, And Education In The Management Of Recurrent Aphthous Stomatitis With Hormonal Predisposing Factors

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Abstract

Recurrent aphthous stomatitis (RAS) is an oral mucosal disorder characterized by recurrent ulceration and may be influenced by various factors, including hormonal fluctuations. This case report aimed to describe the management of minor RAS suspected to be associated with hormonal factors. An 18-year-old female patient presented with painful recurrent oral ulcers on the right and left sides of the lower labial mucosa, which had developed four days before presentation. The lesions had recurred intermittently since adolescence. The patient denied any history of systemic diseases or allergies. Intraoral examination revealed bilateral ulcers measuring less than 1 cm in diameter, while a complete blood count showed a slightly elevated lymphocyte count. The patient was diagnosed with minor RAS and treated with topical triamcinolone acetonide ointment applied to the lesions 2–3 times daily. Communication, information, and education were also provided regarding the condition, oral hygiene, potential triggering factors, and recurrence prevention. At the seven-day follow-up, the lesions had healed. The recurrence pattern associated with menstruation suggested a possible role of hormonal factors, although a causal relationship could not be established. Management with topical therapy and patient education resulted in a favorable clinical outcome.

Keywords: ***Recurrent Aphthous Stomatitis, Ras, Hormonal Factors, Menstruation, Ulcer, Oral Mucosa.***

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is one of the most common oral mucosal disorders encountered in dental practice. It is characterized by recurrent, round or oval, shallow ulcers with a yellowish-white base surrounded by an erythematous halo. RAS lesions are generally painful and may interfere with daily activities, including eating, speaking, and maintaining oral hygiene. The prevalence of RAS is relatively high, ranging from 5% to 25% of the general population, and it tends to occur more frequently among adolescents and young adults (Mandasari & Rahmayanti, 2022). Clinically, RAS is classified into three main types: minor, major, and herpetiform aphthous stomatitis. Among these, minor RAS is the most common type, accounting for approximately 85% of all cases. The classification of minor RAS is not based solely on lesion size but also takes the overall clinical presentation into account. Lesions generally occur on non-keratinized mucosa, particularly in the anterior oral cavity, including the labial and buccal mucosa, floor of the mouth, and ventral or lateral surfaces of the tongue. Minor RAS may present with one to five ulcers simultaneously. Before ulceration develops, a prodromal phase commonly occurs, characterized by a burning or pricking sensation in the affected area. The ulcers subsequently develop as a result of epithelial breakdown (Suryanata et al., 2022). Clinically, minor RAS presents as shallow, round or oval ulcers measuring less than 1 cm in diameter, typically approximately 4–5 mm, with a yellowish-gray base surrounded by a slightly raised erythematous margin. These lesions usually heal within 10–14 days without scarring. Healing is generally followed by an ulcer-free interval of variable duration, typically around 3–4 weeks. However, in some cases, new lesions may develop before previous ulcers have completely healed, resulting in the absence of a lesion-free interval (Wowor et al., 2019).

Determining the etiology of recurrent aphthous stomatitis (RAS) relies heavily on patient history because the condition is multifactorial. One contributing factor, particularly

in women, is hormonal variation, especially fluctuations in estrogen and progesterone levels throughout the menstrual cycle. These hormonal fluctuations may affect immune responses, mucosal vascularization, and oral tissue sensitivity. Consequently, some women experience more frequent RAS outbreaks immediately before or during menstruation (Arma et al., 2023a). The menstrual cycle consists of four phases: the menstrual, follicular, ovulatory, and luteal phases. The first phase is menstruation, during which the endometrial lining is shed, resulting in menstrual bleeding. This phase typically occurs on days 1–5 of the cycle. Estrogen and progesterone levels are at their lowest during this period. The decline in these hormones may alter immune responses and increase oral mucosal sensitivity, potentially triggering RAS ulcers or exacerbating pain in some women. The second phase is the follicular phase, which begins on the first day of menstruation and continues until ovulation. During this phase, follicle-stimulating hormone (FSH) levels rise, stimulating ovarian follicular development. Estrogen levels gradually increase, promoting endometrial proliferation. The rise in estrogen during this phase is generally considered to have a protective effect on the oral mucosa, as estrogen may help maintain epithelial integrity and support tissue vascularization (Sailan et al., 2019).

The third phase is ovulation, which typically occurs around day 14 of a 28-day menstrual cycle. During this phase, a surge in luteinizing hormone (LH) triggers the release of an ovum from the ovary. Estrogen levels peak shortly before ovulation. In some women, rapid hormonal changes during this phase may affect immune homeostasis and trigger RAS lesions, although symptoms do not occur in every individual (Jawed & Tul Kubra Jawed, 2025). The fourth phase is the luteal phase, which extends from ovulation until the onset of the next menstrual period. During this phase, the corpus luteum produces high levels of progesterone, accompanied by lower levels of estrogen. If fertilization does not occur, progesterone and estrogen levels decline toward the end of the luteal phase. This hormonal decline has often been associated with the onset of RAS, as hormonal changes may contribute to mucosal inflammation and increase susceptibility to ulceration. Accordingly, many women report that RAS lesions appear several days before menstruation begins (Alysha et al., 2024).

Given the high prevalence of RAS and its impact on quality of life, effective health promotion and preventive measures are needed to improve public understanding of the condition, particularly its potential association with hormonal factors. One approach is through communication, information, and education (CIE), a strategy used in health promotion to increase knowledge, shape attitudes, and encourage behavioral changes that promote individual health. In the context of RAS, CIE can help individuals understand potential triggers, recognize early symptoms, and adopt basic preventive and self-management measures. By providing accurate and accessible information, this approach is expected to help members of the public, particularly women of reproductive age, better recognize and understand their symptoms and improve their adherence to oral health practices (Novrinda et al., 2023). This case report aims to describe the management of RAS in a patient in whom the condition was associated with hormonal factors.

RESEARCH METHODS

This study is a case report that aims to describe the management of minor recurrent aphthous stomatitis (RAS). An 18-year-old female patient presented with a chief complaint of oral ulcers that had developed four days prior to the visit. The lesions were located on the left and right sides of the lower labial mucosa. The condition was recurrent, with episodes of remission and recurrence since adolescence, and was accompanied by pain. The patient had never received treatment for this condition. She denied any history of systemic diseases

or allergies and had never visited a dentist. The patient reported brushing her teeth twice daily. Her parents had no history of systemic diseases.

Intraoral examination revealed white ulcerative lesions surrounded by an erythematous halo, located bilaterally at the left and right corners of the lower labial mucosa. Each lesion measured less than 1 cm in diameter, with one lesion present on each side, and both lesions were symptomatic (Figure 2). Complete blood count testing revealed a hemoglobin level of 13.1 g/dL (reference range: 11.7–16 g/dL), a hematocrit level of 42% (reference range: 40–55%), a lymphocyte count of 40.7 (reference range: 25–40), a mean corpuscular volume (MCV) of 83.2 (reference range: 80–100), a mean corpuscular hemoglobin (MCH) of 27.5 (reference range: 27–33), and a mean corpuscular hemoglobin concentration (MCHC) of 33 (reference range: 32–36) (Figure 1).

	PEMERIKSAAN	HASIL	NILAI RUJUKAN
1	**Hematologi**		
	Hematologi (CBC)		
	- Hemoglobin (HGB)	14,1	11,7 - 15,5 g/dL**
	- Erithrosit (RBC)	5,13	3,8 - 5,2 10^6/µL**
	- Hematokrit (PCV/HCT)	42,7	35 - 47 %**
	- MCV	83,2	80 - 100 fL**
	- MCH	27,5	26 - 34 pg**
	- MCHC	33,0	32 - 36 g/dL**
	- RDW CV	12,5	11,5 - 14,5 %
	- Lekosit (WBC)	7.930	3.600 - 11.000 /µL**
	Hitung Jenis		
	- Eosinofil %	2,4	2 - 4 %
	- Basofil %	0,4	0 - 1 %
	- Neutrofil %	51,6	50 - 70 %
	- Limfosit %	40,7*	25 - 40 %
	- Monosit %	4,9	2 - 8 %
	- Eosinofil Absolut	190	80 - 360 /µL
	- Basofil Absolut	30	10 - 90 /µL
	- Neutrofil Absolut	4.090	1.310 - 6.710 /µL
	- Limfosit Absolut (ALC)	3.230*	900 - 3.220 /µL
	- Monosit Absolut	390	120 - 620 /µL
	- Trombosit (PLT)	315.000	154.000 - 386.000 /µL**
	- MPV	9,9	7,2 - 11,1 fL
	NLR	1,3	Normal : 1,0 - 3,0

Figure 1. Complete Blood Count Results

Based on the clinical findings, the patient was diagnosed with minor recurrent aphthous stomatitis (RAS), as the lesions measured less than 1 cm in diameter. Laboratory examination revealed a slightly elevated lymphocyte count.

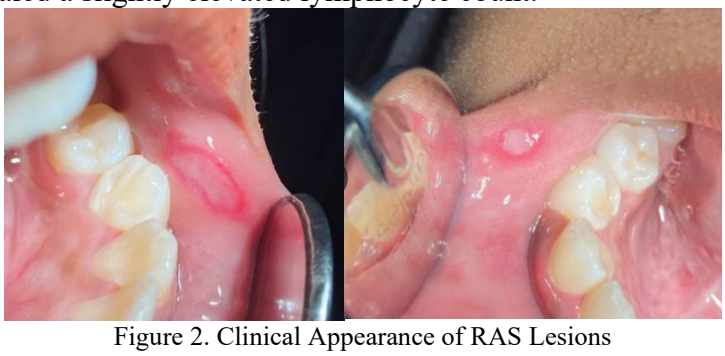


Figure 2. Clinical Appearance of RAS Lesions

RESULTS AND DISCUSSION

The patient was treated with topical triamcinolone acetonide ointment, applied to the lesions 2–3 times daily. The patient was advised to return for a follow-up visit after seven days of treatment. In addition, communication, information, and education (CIE) were provided regarding the patient's condition. In terms of communication, the dentist explained in simple and understandable language that the patient's recurrent oral ulcers were consistent with minor recurrent aphthous stomatitis (RAS), a condition characterized by recurrent episodes that may begin during adolescence. The patient was informed that RAS is not contagious and that its occurrence may be associated with several contributing factors,

including hormonal fluctuations in women, which may influence the immune response and the condition of the oral mucosa. Explaining the recurrent nature of the disease was important to reduce the patient's anxiety about the possibility of future episodes. The dentist also explained that the blood test results were generally within the provided reference ranges, although the lymphocyte count was slightly elevated, potentially reflecting an inflammatory response. However, this finding alone does not establish the cause of the oral ulcers.

Regarding information, the patient was educated about the clinical characteristics and possible mechanisms underlying RAS. The dentist explained that RAS involves inflammatory ulceration of the oral mucosa, typically presenting as painful, white or yellowish ulcers surrounded by an erythematous halo. The patient was also informed that hormonal fluctuations during the menstrual cycle may influence oral mucosal sensitivity in some individuals. Other potential factors associated with RAS recurrence include stress, inadequate sleep, fatigue, nutritional deficiencies, and local trauma to the oral mucosa. Information was also provided regarding the use of topical triamcinolone acetonide to reduce inflammation and pain and support lesion healing. Understanding these potential contributing factors was expected to help the patient recognize recurrence patterns and minimize exposure to identifiable triggers.

In terms of education, the patient was advised to implement self-care measures and lifestyle modifications to support oral health and potentially reduce RAS recurrence. These measures included maintaining oral hygiene by brushing twice daily, after breakfast and before bedtime, and attending routine dental check-ups every six months. The patient was instructed to use triamcinolone acetonide ointment according to the dentist's directions and to return for follow-up after seven days to assess lesion healing. Additionally, the patient was encouraged to maintain adequate rest, engage in regular physical activity, and consume a balanced diet containing fruits, green vegetables, and protein sources to support general health and tissue repair. The patient was also advised to avoid excessively spicy, hot, or hard foods that could irritate the lesions and exacerbate pain. These educational measures aimed to help the patient manage modifiable contributing factors, support healing, and potentially minimize recurrence. At the seven-day follow-up visit, the aphthous lesions had healed, indicating a favorable clinical response to the treatment provided (Figure 3).



Figure 3. Clinical Condition at the Seven-Day Follow-Up Visit

Recurrent aphthous stomatitis (RAS) is a recurrent, multifactorial ulcerative condition of the oral mucosa. In female patients, one potential contributing factor is hormonal fluctuation, particularly in relation to the menstrual cycle. In this case, the recurrent episodes of RAS occurring predominantly around menstruation suggest a possible association with hormonal changes. This relationship may involve fluctuations in estrogen and progesterone levels throughout the menstrual cycle, which may influence oral mucosal integrity and local immune responses (Amalina & Layyinatus Syifa, 2025).

The menstrual cycle consists of four phases: the follicular phase, ovulation, the luteal phase, and menstruation. During the late luteal phase and the onset of menstruation, estrogen

and progesterone levels decline substantially due to corpus luteum regression when fertilization does not occur. These hormonal changes may affect oral mucosal tissues. Estrogen plays an important role in the proliferation, differentiation, and maturation of mucosal epithelial cells, including the maintenance of epithelial thickness and keratinization (Manoj et al., 2023) . A decline in estrogen levels may affect epithelial maintenance and tissue repair, potentially increasing mucosal susceptibility to minor trauma and local irritation. Progesterone may also influence vascular permeability and inflammatory responses. Fluctuations in progesterone levels may affect the microcirculation of the oral mucosa, vascular permeability, tissue edema, and collagen metabolism. These changes may increase mucosal sensitivity to mechanical stimuli, such as friction during speaking, eating, or toothbrushing, potentially contributing to the development of aphthous ulcers (Zakaria Amien & Widagdho Dinutanayo, 2024).

From an immunological perspective, hormonal fluctuations may also modulate immune function, particularly T-cell-mediated cellular immunity. The pathogenesis of RAS is associated with an abnormal immune response to local antigens in the oral mucosa. Changes in estrogen levels around menstruation may influence the production of pro-inflammatory cytokines, including tumor necrosis factor-alpha (TNF-α), interleukin-2 (IL-2), and interferon-gamma (IFN-γ), which are involved in the activation of cytotoxic T lymphocytes (Rambe et al., 2024). The resulting immune response may contribute to epithelial cell damage and the formation of characteristic RAS ulcers. In this case, the laboratory finding of a slightly elevated lymphocyte count may be consistent with immune activation; however, this finding alone does not establish the underlying mechanism or confirm that the lymphocyte elevation is directly related to RAS. Histopathologically, early RAS lesions may exhibit infiltration of mononuclear inflammatory cells, particularly lymphocytes, beneath the basal epithelial layer. Activated T lymphocytes release inflammatory mediators that may contribute to epithelial apoptosis and basement membrane damage, leading to superficial tissue necrosis and subsequent ulcer formation (Laksitasari et al., 2025).

The possible association between RAS and menstruation in this case was further supported by the patient's history. During the medical interview, the patient reported that oral ulcers frequently developed several days before menstruation. This pattern is consistent with reports that some women experience recurrent lesions during the luteal phase, particularly in the days preceding menstruation, with improvement or resolution following the menstrual period. Such episodes may be associated with declining estrogen and progesterone levels during the late luteal phase, which may influence immune regulation, inflammatory mediator production, and oral mucosal sensitivity to irritation and minor trauma. Hormonal changes may also affect epithelial repair, potentially increasing susceptibility to ulceration. These observations suggest that hormonal fluctuations may act as a contributing factor to RAS recurrence in susceptible individuals (Mahardika et al., 2022). In addition to hormonal changes, the late luteal phase may coincide with physical and psychological changes, including emotional stress, fatigue, altered sleep patterns, increased pain sensitivity, and changes in dietary habits. These factors may further aggravate RAS symptoms in some individuals. The interaction of these factors may influence the mucosal immune response, potentially contributing to the recurrence and severity of oral ulcers. Some patients report episodes occurring at similar times during successive menstrual cycles, making the temporal pattern clinically useful when taking a detailed patient history. Therefore, identifying the relationship between lesion onset and the menstrual cycle is an important component of assessing potential etiological and predisposing factors for RAS in female patients (Naritasari et al., 2025).

Some reports suggest that hormonal states characterized by more stable hormone levels, such as pregnancy or the use of certain hormonal contraceptives, may be associated with changes in RAS recurrence patterns. These observations provide further support for a possible hormonal contribution to RAS, although the underlying mechanisms remain incompletely understood. Hormonal fluctuations may influence T-cell activity and inflammatory responses in the oral mucosa, potentially contributing to superficial epithelial damage and aphthous ulcer formation. In the present case, the slightly elevated lymphocyte count may indicate an immune response but cannot independently confirm the proposed pathogenesis. Taken together, the patient's history suggests that RAS recurrence may be temporally associated with menstrual hormonal fluctuations, particularly during the late luteal phase (Tosepu & Effendy, 2022). Therefore, management should not focus solely on symptomatic lesion treatment but should also consider potential predisposing factors. In this context, communication, information, and education (CIE) are important for helping the patient understand the possible relationship between the menstrual cycle and recurrent oral ulcers. With adequate understanding, the patient may be better able to recognize periods of increased susceptibility, minimize additional contributing factors such as stress and inadequate rest, maintain a balanced diet and good oral hygiene, and implement preventive measures when early symptoms occur (Arma et al., 2023b).

In terms of communication, the dentist should explain in clear and accessible language that the patient's recurrent ulcers may not be attributable solely to local trauma but may also be associated with physiological hormonal changes. This explanation is important to alleviate anxiety and improve the patient's understanding that episodes may recur at particular times, especially before or during menstruation. Effective communication can help the patient recognize and monitor individual recurrence patterns (Elias et al., 2022). Regarding information, the patient should receive a straightforward explanation of the possible mechanisms underlying RAS. For example, hormonal fluctuations may influence oral mucosal sensitivity and inflammatory responses, potentially making the mucosa more susceptible to irritation and ulceration. Information should also address other factors that may aggravate the condition, including stress, fatigue, and nutritional deficiencies, which may interact with hormonal changes and affect inflammatory responses. This knowledge can help the patient identify potential triggers and adopt appropriate preventive measures (Femilian et al., 2024).

In terms of education, the patient should be encouraged to implement lifestyle modifications that may help reduce the frequency or severity of RAS episodes.[19] These measures include stress management, maintaining adequate sleep, and consuming a balanced diet rich in essential vitamins and minerals to support mucosal repair and normal immune function. The patient should also maintain good oral hygiene and avoid foods that irritate the oral mucosa, particularly when such foods exacerbate symptoms during the premenstrual period. Because physiological hormonal fluctuations cannot be entirely prevented, the main objective is to manage modifiable contributing factors and improve symptom control. The patient should also be advised to consult an obstetrician-gynecologist if the symptoms are severe, significantly interfere with daily activities, or show a consistent menstrual association that warrants further assessment (Lestari & Naviatullaily, 2026).

CONCLUSION

Based on the present case, the pathogenesis of RAS may involve interactions among fluctuations in female reproductive hormones, reduced oral mucosal resilience, and altered cellular immune responses. The patient's slightly elevated lymphocyte count may reflect immune activation; however, this finding alone is insufficient to establish increased cellular immune activity as the underlying mechanism of the lesions. The recurrent ulcerative episodes occurring predominantly around menstruation suggest a possible association between hormonal fluctuations and RAS recurrence. Further hormonal investigations may be considered when clinically indicated to assess suspected endocrine abnormalities or other relevant conditions.

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