Prevalence of Recurrent Aphthous Stomatitis among Dental Students: A Cross Sectional Study

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ABSTRACT

Aim: This study aims to determine the prevalence of recurrent aphthous stomatitis (RAS) among dental students.

Materials and methods: Dental students were asked to complete a questionnaire to investigate different aspects of RAS including prevalence, frequency of recurrence, and management modalities.

Results: Of the 382 study participants (230 women, 152 men; 21–28 years old), 83 had a history of RAS (45 women, 38 men). A positive family history of RAS was more common in participants with RAS (48.2%) than in those without RAS (9.0%). Stress was reported as the most common trigger for an attack (53%), and the most commonly affected sites were the labial and the buccal mucosa. Reported treatment modalities included topical anesthetic, honey, and/or warm salt water rinsing; however, most participants reported no benefit from treatment apart from a temporary relief.

Conclusion: RAS is common among dental students in Kingdom of Saudi Arabia. Despite ongoing research, the etiology of RAS is still unknown, and only symptomatic treatment is available.

Clinical significance: RAS is a common painful oral ulcerative condition affecting young adults. RAS interferes with eating and speaking, affecting the quality of life.

Keywords: Aphthous ulcers, Dental students, Recurrent aphthous stomatitis, Stress.

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Introduction

RAS is characterized by recurrent, self-limiting oral mucosal ulcers that mainly affect the nonkeratinized oral mucosa. A burning sensation often precedes the onset of ulcers. RAS usually begins in childhood and is thought to affect both genders equally, although some studies report a female predominance. The disorder is classified as minor, major, or herpetiform, with minor RAS being the most common clinical form. 

In clinically minor RAS, the ulcers are small (≤1 cm diameter), round, shallow, painful, and well circumscribed, covered by a yellow-gray pseudomembrane and surrounded by an erythematous halo. The ulceration generally heals without scarring after 10–14 days. Major RAS is characterized by ulcers that are typically larger and deeper than those of minor RAS. Furthermore, they heal more slowly and often cause scarring. Herpetiform ulcers manifest as multiple recurrent clusters of small ulcers (≤4 mm diameter) scattered throughout the oral mucosa. These ulcers may coalesce to form large irregular ulcers that can cause considerable pain, weakness, and weight loss, requiring hospitalization in severe cases.

Although the etiology of RAS is largely unknown, it is thought to have a multifactorial basis. A genetic susceptibility is possible as there is often a family history of the condition in RAS patients. Factors associated with increased frequency or severity of ulcers include reduced vitamin B12 levels, trauma, smoking cessation, stress, infection, immune defects, food sensitivity, menstrual cycle, and infant-feeding practices.

A literature search revealed a dearth of studies assessing the prevalence of RAS in Kingdom of Saudi Arabia. Therefore, we investigated different aspects of RAS (e.g., prevalence, frequency of recurrence, and management modalities) among dental students at King Abdulaziz University, Kingdom of Saudi Arabia.

Materials and Methods

This descriptive, cross-sectional survey was approved by the Research Ethics Committee of the Faculty of Dentistry at King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia. A self-administered 23-item questionnaire was developed and distributed to undergraduate clinical dental students at King Abdulaziz University from June 2015 to July 2015. The students participated on a voluntary basis and were assured confidentiality of the responses. The students who were suffering from systemic diseases and were on medication that leads to immunosuppression were excluded from the study.

The questionnaire consisted of two main sections. The first section contained questions about demographics (e.g., age, gender) and smoking practices, and the second section contained questions related to RAS, such as frequency of recurrence, duration of pain, number of ulcers per attack, healing time, triggering factors, investigations performed, and treatment modalities. Most questions were close-ended, but there were a few open-ended questions were close-ended, but there were a few open-ended...
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**Table 1: Gender distribution of RAS in dental students**

| Gender | History of RAS | Yes, n (%) | No, n (%) | Total |
|--------|---------------|------------|-----------|-------|
| Men    |               | 38 (9.9)   | 114 (29.8) | 152   |
| Women  |               | 45 (11.8)  | 185 (48.4) | 230   |
| Total  |               | 83 (21.7)  | 299 (78.3) | 382   |

**Table 2: Students with a history of RAS**

| Year | Men | Women | Total |
|------|-----|-------|-------|
| 4th year | 2   | 2     | 4     |
| 5th year | 3   | 5     | 8     |
| 6th year | 22  | 15    | 37    |
| Interns  | 11  | 23    | 34    |
| Total    | 38  | 45    | 83    |

**Table 3: Family history of RAS among dental students**

| Positive family history, n (%) | Negative family history, n (%) | Do not know, n (%) | Total |
|--------------------------------|--------------------------------|-------------------|-------|
| Students with RAS             | 40 (48.2)                      | 8 (9.6)           | 35 (42.2) | 83    |
| Students without RAS          | 27 (9.0)                       | 137 (45.8)        | 135 (45.2) | 299   |
| Total                         | 67 (17.5)                      | 145 (38.0)        | 170 (44.5) | 382   |

**Table 4: Perceived causes of RAS attacks**

| Cause                  | N  |
|------------------------|----|
| Stress                 | 44 |
| Certain foods          | 11 |
| Trauma                 | 23 |
| Menstrual cycle        | 5  |
| Illness                | 7  |
| Medications            | 3  |
| Gastrointestinal problem | 1  |
| Smoking cessation       | 1  |

Most of the students affected by RAS (63, 76%) did not use any medication during the present outbreak because they did not find any treatment effective in their earlier experience. Of the remaining 20 students, 15 reported benefit from treatment, which consisted of topical anesthesia spray, anesthetic gel, honey, Pyralvex (Meda Pharmaceuticals Ltd, Takeley, Bishop's Stortford, UK), and/or warm salt water rinsing.

**Discussion**

RAS is a common ulcerative condition affecting the oral mucosa. It has been reported to be more common among teenagers and women.1,2 The results of our study also showed a higher prevalence in females during their teenage years. Previous studies have suggested that smoking protects against RAS through increased keratinization of the oral mucosa, which acts as a mechanical and chemical barrier against trauma or microbes.14 However, the results of our study did not support this indication, as 55 of the 83 students with RAS in this study were cigarette smokers, and only one student reported that RAS onset corresponded with smoking cessation.

Numerous studies have reported an increased prevalence of RAS among dental students.12,15,16 In the present study, we found that RAS affected 21.7% of the dental students who completed our questionnaire, and the prevalence was slightly higher among women (1.2:1), which is consistent with previous studies.12,15,16

RAS is characterized by recurrent episodes of painful oral ulcers that are oval or round with peripheral erythema and sometimes a yellow-gray pseudomembrane less than 1 cm in diameter.5,17 Minor RAS is the most common clinical form.4

In patients with minor RAS, one to five ulcers appear at the same time. In our study, most of the students with RAS had 1–2 ulcers at a time, but 14.5% of the participants reported a variable number of ulcers with each attack. The most commonly affected sites were the labial mucosa (43 patients) and the buccal mucosa (28 patients), which is consistent with the findings of McCullough et al.4 Whereas in the study conducted by Sharma, RAS was most commonly observed in the cheeks (15.8%) followed by the lips (12.20%).18 Similarly, Schneider et al. reported that RAS was most commonly seen in the buccal mucosa and the labial mucosa and floor of the mouth and tongue among Jordanian dental students.19

RAS occurs in the areas of the mouth where the mucosa is loosely attached and nonkeratinized, especially the labial mucosa, the buccal mucosa floor of the mouth, and ventral surface of the tongue and the soft palate.20

In this study, stress was the most frequently reported cause of RAS attacks (44, 53%). Studies have reported that dental education induces considerable stress on dental students. Fear of failure, workload, parental expectations, behavior of the faculty, academic questions to allow free response. Data were analyzed using the SPSS software, version 22 (SPSS, Inc. IBM, Chicago, IL, USA). Responses were expressed as percentages.
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load, and fear of unemployment after graduation were some of the many factors which were reported to be contributing for increased stress among dental students.21

Patients with RAS usually experience pain, which may be exacerbated by eating citrus fruit or direct trauma to the ulcer. In the present study, 35 students reported that RAS affected their quality of life, and 21 reported that RAS sometimes interfered with eating and speaking. The average healing time reported by the students in our study is consistent with the finding of a previous study,6 and the average duration of pain was 4.4 days. It is well recognized that the RAS-associated symptoms such as pain during eating, speaking, and swallowing; discomfort; impairment in food and liquid intake, and problems in interpersonal relationships and self-esteem can deeply affect the oral health-related quality of life among the affected.22

Etiological factors of RAS may include reduced vitamin B12 levels,10 trauma, smoking cessation, stress, infection, immune defects, food sensitivity, menstrual cycle, and infant-feeding practices.4,13 In this study, 44 of the 83 students with RAS reported stress as a trigger for an attack. The number of studies concerned with stress management is less as compared to the studies concerned with identifying sources of stress. Cognitive-behavioral management techniques have been found to be beneficial in reducing stress, other stress management programs like changes in the length and type of curriculum, self-hypnosis, mindfulness-based stress reduction, meditation, and changes in the pass/fail grading system can be used to manage the stress among students.23

In addition, our findings are consistent with a possible genetic predisposition for RAS,11 as a positive family history was more common among students with RAS (48.2%) than those without RAS (9.0%). Similarly, a study conducted by Maheswaran et al. also found that 63% of the students participated in their study had a positive family history.24 A study among Jordanian patients by Safadi also showed a positive family history among 66.4% of the participants.25

The aims of treatment for RAS are to control pain, accelerate ulcer healing, and prevent secondary infection. The participants of this study used different treatments; however, there is no standard management protocol, and most treatments provide no benefit. For that reason, most of the students with RAS in this study did not use any medication when they had an attack. Despite ongoing research, there are no available treatments that can prevent recurrence or shorten healing time; thus, treatment remains symptomatic.

One limitation of this study is the lack of clinical examination, which would be needed to confirm the diagnosis of RAS in participants and their family members.

CONCLUSION

RAS, a common condition that affects the quality of life, is prevalent among dental students in Kingdom of Saudi Arabia. Despite considerable research efforts, the etiology of RAS is still unknown, and only symptomatic treatments are currently available.

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