

# 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.<sup>1,2</sup> The disorder is classified as minor, major, or herpetiform, with minor RAS being the most common clinical form.<sup>3–5</sup>

In clinically minor RAS, the ulcers are small ( $\leq 1$  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.<sup>6–8</sup> These ulcers may coalesce to form large irregular ulcers that can cause considerable pain, weakness, and weight loss, requiring hospitalization in severe cases.<sup>9</sup>

Although the etiology of RAS is largely unknown, it is thought to have a multifactorial basis.<sup>10</sup> A genetic susceptibility is possible as there is often a family history of the condition in RAS patients.<sup>11,12</sup> Factors associated with increased frequency or severity of ulcers include reduced vitamin B12 levels<sup>10</sup> trauma, smoking cessation, stress, infection, immune defects, food sensitivity, menstrual cycle, and infant-feeding practices.<sup>4,13</sup>

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.

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## 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 to allow free response. Data were analyzed using the SPSS software, version 22 (SPSS, Inc. IBM, Chicago, IL, USA). Responses were expressed as percentages.

**RESULTS**

A total of 382 students in their clinical years of dental school were included in this study (230 women, 152 men; female-to-male ratio, 1.5:1) (Table 1). The mean age was 22.3 years (range 21–28). Eighty-three (21.7%) students (45 women, 38 men) experienced RAS. Most of these students were in their final year of dental school (37, 44.6%) or in the internship program (34, 40.1%) (Table 2). Fifty-five of the students smoked cigarettes, 44 smoked shisha tobacco (Hubbly Bubbly), two used smokeless tobacco, and six were previous smokers.

Among students with RAS, 35 reported that the bouts always interfered with eating and speaking, whereas 21 reported that occurrences sometimes affected eating and speaking. RAS occurrences were reported as painful but tolerable by 29 students. The mean pain duration was 4.4 days, and the mean persistence was 6 days (range, 2–14 days). The ulcers appeared singly (58 patients), two at a time (10 patients), more than two at a time (3 patients), or varied with each attack (12 patients).

The mean age of onset of RAS in this cohort was 14.4 years (standard deviation, 6.3). The most commonly reported site of involvement was the labial mucosa (43 patients), followed by the buccal mucosa (28 patients), and other sites (12 patients).

A positive family history was reported by 40 (48.2%) students with RAS, but by only 27 (9.0%) students without RAS (Table 3). Stress was the most frequently reported cause of RAS attacks (44, 53%). Other perceived causes were trauma (23, 27.7%) and certain foods (11, 13.3%) (Table 4).

Thirteen students had undergone blood tests to determine the cause of RAS, but in all cases, results were within normal ranges.

**Table 1:** Gender distribution of RAS in dental students

Gender	History of RAS		Total
	Yes, n (%)	No, n (%)	
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

	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.<sup>1,2</sup> 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.<sup>14</sup> 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.<sup>12,15,16</sup> 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.<sup>12,15,16</sup>

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.<sup>6,17</sup> Minor RAS is the most common clinical form.<sup>4</sup>

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.<sup>4</sup> Whereas in the study conducted by Sharma, RAS was most commonly observed in the cheeks (15.8%) followed by the lips (12.20%).<sup>18</sup> 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.<sup>19</sup> 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.<sup>20</sup>

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



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.<sup>21</sup>

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,<sup>6</sup> 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.<sup>22</sup>

Etiological factors of RAS may include reduced vitamin B12 levels,<sup>10</sup> trauma, smoking cessation, stress, infection, immune defects, food sensitivity, menstrual cycle, and infant-feeding practices.<sup>4,13</sup> 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.<sup>23</sup>

In addition, our findings are consistent with a possible genetic predisposition for RAS,<sup>11</sup> 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.<sup>24</sup> A study among Jordanian patients by Safadi also showed a positive family history among 66.4% of the participants.<sup>25</sup>

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.

## REFERENCES

1. Davatchi F, Tehrani-Banihashemi A, et al. The prevalence of oral aphthosis in a normal population in Iran: a WHO-ILAR COPCORD study. *Arch Iran Med* 2008 Mar;11(2):207–209.
2. Oh SH, Han EC, et al. Comparison of the clinical features of recurrent aphthous stomatitis and Behçet's disease. *Clin Exp Dermatol* 2009;34(6):e208–e212. DOI: 10.1111/j.1365-2230.2009.03384.x.
3. Chattopadhyay A, Chatterjee S. Risk indicators for recurrent aphthous ulcers among adults in the US. *Community Dent Oral Epidemiol* 2007;35:152–159. DOI: 10.1111/j.1600-0528.2007.00329.x.
4. McCullough MJ, Abdel-Hafeth S, et al. Recurrent aphthous stomatitis revisited; clinical features, associations, and new association with infant feeding practices? *J Oral Pathol Med* 2007;36:615–620. DOI: 10.1111/j.1600-0714.2007.00589.x.
5. Pentenero M, Broccoletti R, et al. The prevalence of oral mucosal lesions in adults from the Turin area. *Oral Dis* 2008;14:356–366. DOI: 10.1111/j.1601-0825.2007.01391.x.
6. Rogers 3rd RS. Recurrent aphthous stomatitis: clinical characteristics and associated systemic disorders. *Semin Cutan Med Surg* 1997;16:278–283. DOI: 10.1016/S1085-5629(97)80017-X.
7. Jurge S, Kuffer R, et al. Mucosal disease series. Number VI. Recurrent aphthous stomatitis. *Oral Dis* 2006;12:1–21. DOI: 10.1111/j.1601-0825.2005.01143.x.
8. Scully C, Porter S. Oral mucosal disease: recurrent aphthous stomatitis. *Br J Oral Maxillofac Surg* 2008;46:198–206. DOI: 10.1016/j.bjoms.2007.07.201.
9. Viguier M, Fouere S, et al. Herpetiform ulceration: 5 cases. *Ann Dermatol Venereol* 2000;127:707–710.
10. Koybasi S, Parlak AH, et al. Recurrent aphthous stomatitis: investigation of possible etiologic factors. *Am J Otolaryngol* 2006;27:229–232. DOI: 10.1016/j.amjoto.2005.09.022.
11. Porter SR, Scully C, et al. Recurrent Aphthous Stomatitis. *Crit Rev Oral Biol Med* 1998;9:306–321. DOI: 10.1177/10454411980090030401.
12. Maheswaran T, Yamunadevi A, et al. Prevalence and family history of recurrent aphthous stomatitis among the students of a dental institution in south India. *J Indian Acad Dent Spec Res* 2014;1:53–55. DOI: 10.4103/2229-3019.148250.
13. Porter SR, Hegarty A, et al. Recurrent aphthous stomatitis. *Clin Dermatol* 2000;18:569–578. DOI: 10.1016/S0738-081X(00)00147-4.
14. Scully C, Gorsky M, et al. The diagnosis and management of recurrent aphthous stomatitis: a consensus approach. *J Am Dent Assoc* 2003;134:200–207. DOI: 10.14219/jada.archive.2003.0134.
15. Donatsky O. Epidemiologic study on recurrent aphthous ulcerations among 512 Danish dental students. *Community Dent Oral Epidemiol* 1973;1:37–40. DOI: 10.1111/j.1600-0528.1973.tb01060.x.
16. Byahatti SM. Incidence of Recurrent Aphthous ulcers in a group of student population in Libya: A Questionnaire Study. *Arch Cran Oro Fac Sc* 2013;1:26–30.
17. Natah SS, Konttinen YT, et al. Recurrent aphthous ulcers today: a review of the growing knowledge. *Int J Oral Maxillofac Surg* 2004;33:221–234. DOI: 10.1006/ijom.2002.0446.
18. Sharma M, Gupta R, et al. Correlation of psychological stress with recurrent aphthous stomatitis among dental students in an educational institution. *Int J Appl Dent Sci* 2017;3(4):455–458.
19. Schneider LC, Schneider AE. Diagnosis of oral ulcers. *Mt Sinai J Med* 1998;65(5–6):383–387.
20. Wolfgang AP. The health professions stress inventory. *Psychol Rep* 1988;62:220–222. DOI: 10.2466/pr0.1988.62.1.220.
21. Tangade PS, Mathur A, et al. Assessment of stress level among dental school students: An indian outlook. *Dent Res J (Isfahan)* 2011;8(2):95–101.
22. Gurleyen EK, Ogut-Erisen M, et al. Quality of life in patients with recurrent aphthous stomatitis treated with a mucoadhesive patch containing citrus essential oil. *Patient Prefer Adherence* 2016;27:967–973. DOI: 10.2147/PPA.S106530.
23. Heath JR, Macfarlane TV, et al. Perceived sources of stress in dental students. *Dent Update* 1999 Apr;26(3):94–98, 100. DOI: 10.12968/denu.1999.26.3.94.
24. Maheswaran T, Yamunadevi A, et al. Prevalence and family history of recurrent aphthous stomatitis among the students of a dental institution in south India. *J Indian Acad Dent Spec Res* 2014;1:53–55.
25. Safadi RA. Prevalence of recurrent aphthous ulceration in Jordanian dental patients. *BMC Oral Health* 2009;9:31. DOI: 10.1186/1472-6831-9-31.