



Original Article

Association of Lifestyle and Aphthous Stomatitis among Dentistry Students



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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is the most common ulcerative oral lesions. Many factors including genetics, stress, lifestyle, gastric diseases and nutritional habits play a major role in the etiology of recurrent aphthous ulcers. The aim of this study was to evaluate the lifestyle of patients with a history of aphthous stomatitis.

Methods: This cross-sectional study was conducted on 99 dentistry students with a history of aphthous stomatitis. The control group consisted of 145 dentistry students without any history of the lesion. Demographic information and lifestyle factors including smoking, body mass index, place of living, marital status, regular exercise were recorded. Nutritional habits were evaluated using a modified Food Frequency Questionnaire containing 95 food variables. Independent t-test and Mann Whitney test were used to compare the two groups. Linear regression analysis were used to determine the predictors.

Results: There were no significant difference in nutritional habits of study participants. A family history of RAS was more frequently noticed in the case group (43.1%) rather than control group (27.7). Multivariate logistic regression model showed that the most powerful predictors of aphthous lesions were familial history of lesions (OR = 2.4, 95%CI: 1.11-5.13) and food allergy (OR = 4.71, 95%CI: 2.70 to 8.22) respectively.

Conclusion: Based on the results of the present study, life style and diet are not associated with aphthous lesions. Considering that aphthous stomatitis is a multifactorial disease, there is a need to study other risk factors and laboratory tests.

Keywords: Aphthous Stomatitis, Life Style, Nutritional Status

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Introduction

Aphthous ulcer, as the most common ulcerative status of the oral mucosa, encompasses recurrent, single or multiple, small, round or ovoid ulcers in the non-keratinized mucosa on a yellowish base surrounded by a red halo. Aphthous ulcers occur in 5 to 25% of the population and the three-month recurrence rate of these ulcers is approximately 50% (1). These ulcers are more common in women, younger

people and individuals with higher socio-economic status, and usually occur during the second decade of life. Aphthous ulcers are painful and debilitating for most patients and force them to seek a treatment. Aphthous ulcer or Recurrent Aphthous Stomatitis (RAS) is signified by occurrence of recurrent ulcers limited to the oral mucosa of otherwise asymptomatic patients. In the studies on different

ethnicities with different socio-economic status, the incidence rate varies between 5 to 66% (2-4).

Lifestyle refers to a combination of needs and desires influenced by factors such as culture, family, groups and social class. Unhealthy lifestyle such as smoking, stress, improper diet and lack of physical activity significantly endangers humans' life (5). Each of the factors related to lifestyle can have an undeniable effect on the occurrence of oral aphthous lesions. Stress is an effective factor in the formation of aphthous ulcers and causes aphthous ulcers through different mechanisms such as trauma to the oral soft tissue caused by functional habits such as cheek and lip biting (4). Some researchers have shown the correlation between aphthous ulcers and some psychological factors such as anxiety, repression of anger and rage, occupational factors and other stress factors (6). Several studies have discussed the negative correlation between smoking and RAS. Nicotine or its metabolites decrease the level of pro-inflammatory cytokines like TNF- α , Interleukin 1 and 6 and also increase the level of anti-inflammatory cytokines such as Interleukin 10 (2, 6).

Another parameter of lifestyle is oral hygiene. It has been understood that the use of dental floss and toothbrush for at least 2 minutes and 2 to 3 times a day can prevent aphthous ulcers (7). Part of the patients with RAS may have nutritional deficiencies. Vitamin B12, acid folic, iron, ferritin, vitamins B1, B2, B6, C and calcium deficiencies have been detected in a group of patients with RAS (8, 9). Iron, vitamin B12 and acid folic deficiencies play a more important role in susceptibility to RAS (10).

Nutritional habits can be recognized as part of the lifestyle. The food pyramid is comprised of four categories. Each of the food groups only provides part of the foods necessary for body and none of them can be substituted by another food group. Fats, sweets and salt which are placed at the top of the food pyramid should be consumed limitedly. Bread, cereals, rice and macaroni are at the base of the pyramid. Daily consumption of 3 to 5 units of vegetables and 2 to 4 unit of fruits is recommended, as these are important sources of vitamins A and C and potassium. Daily consumption of 2 to 3 units of meat, chicken, fish, milk, yogurt and cheese is also recommended (11-13).

Since there was some discrepancy between aphthous ulcers and different type of nutritional habit this study aimed to assess the relationship between nutritional habit and life style with occurrence of aphthous ulcers.

Methods

This cross-sectional study involved dentistry students of the dental branch of Guilan University of Medical Sciences (Rasht and International Campus). The case group consisted of individuals that had been affected with aphthous ulcers at least twice during the last year. A frequency age-matched classmates without history of aphthous ulcers were considered as control group. All the participants signed an informed consent. Data collection form was included the questions about smoking status, self-reported body mass index (BMI) value, place of living, regular exercise and marital status. Smoking was defined as current daily smoking of one or more cigarette. Regular exercise was considered as moderate physical activity at least three times a week. Nutrition style was

evaluated using the modified Food Frequency Questionnaire (FFQ) including 95 food variables (The validity and reliability of the questionnaire had been evaluated during the national scheme for screening esophageal cancer). The questionnaire has been validated in an Iranian population and assesses food groups of bread and cereals, meat and meat products, beans, oils and butter, vegetables, fruits, sugars and sweets, beverages and spices (14). The response choices were recorded as never, yearly, monthly, weekly and daily. In each case the amount of consumption was also registered.

To ensure the accuracy of the answers provided by the students, before distributing the questionnaires, different types of aphthous lesions and their differential diagnoses were explained and some pictures of different types of aphthous ulcers were presented. In the demographic specification section, the information related to factors (age, gender, systemic diseases, food allergy, family history of aphthous lesion, location of RAS, season of incidence) were recorded.

Data were analysed with SPSS software version 21. Frequency (percentage) and mean (standard deviation) were used to describe variables. Chi-Square and Mann-Whitney U test was used for comparing the qualitative and quantitative variables between the two groups (students with and without history of RAS). Multivariable logistic regression was performed to determine variables independently related to have RAS experience. In all analyses the significance level was 0.05.

Results

Of all 244 studied students, 239 completed the questionnaire and entered into the analyses. The average age of students was 23.3 ± 4.9 years (range: 19-58). Ninety eight students (41%, 95%CI: 34.76- 47.23%) had a history of aphthous lesion during the last year. Twenty nine percent had one, 64% had two and 7% had three or more times of aphthous lesion experience in last year. The most common sites of aphthous lesions were the lips (44%), cheek (27%), soft palate (17%) and other areas (12%), respectively. The most common season of occurrence of aphthous lesion was summer 61 (62%), followed by autumn 36 (37%), winter 29 (30%) and spring 26 (27%). The 42 (43%) and 38 (39%) of the students with a history of aphthous lesion stated that the stress of work and exam times coincided with the incidence of aphthous lesions and the 9 (15%) of the girl students stated that the menstrual period coincided with the incidence of aphthous lesions. Demographic characteristics of the study participants are presented in table 1.

None of the demographic characteristics were differ between the students with and without history of aphthous lesion (P-value > 0.05, for all, table 1) except having family history of the aphthous lesion (P-value < 0.001) and food allergy of the student (P-value = 0.001). Aphthous lesion occurred more in students with a family history (65% versus 28%) and food allergy (24% versus 9%) compared with students without a family history or food allergy.

Also, the data showed that factors related to the lifestyle of students (including smoking, BMI, marital status, residence and regular exercise) were not significantly different between students with and without history of aphthous lesions (P-value > 0.10 for all; table 1).

Table 1. Demographic Characteristics of Participants

Characteristic	Total (n = 239)	Without RAS (n = 141)	With RAS (n = 98)	P-value
Sex				0.180
Male	105 (43.9)	67 (47.5)	38 (38.8)	
Female	134 (56.1)	74(52.5)	60 (61.2)	
Age in year, median (range)	23 (19-58)	23 (19-58)	22.5 (19-53)	0.035
Smoking	28 (11.7)	19 (13.5)	9 (9.2)	0.310
No. of packets in year, median (range)	59.5 (10-180)	50 (10-180)	60 (20-100)	0.396
History of RAS in family	103 (43.1)	39 (27.7)	64 (65.3)	0.001
Systemic disease	5 (2.1)	1 (0.7)	4 (4.1)	0.162
Food allergy	35 (14.6)	12 (8.5)	23 (23.5)	0.001
Body mass index				0.579
< 20	29 (12.1)	17 (12.1)	12 (12.2)	
20-24	168 (70.3)	100 (70.9)	68 (69.4)	
25-30	38 (15.9)	23 (16.3)	15 (15.3)	
> 30	4 (1.7)	1 (0.7)	3 (3.1)	
Marital status				0.175
Married	22 (9.2)	10 (7.1)	12 (12.2)	
Single	217 (90.8)	131 (92.9)	86 (87.8)	
Exercise	76 (31.8)	43 (30.5)	33 (33.7)	0.604
Place of living				0.768
Urban	223 (93.3)	131 (92.9)	92 (93.9)	
Rural	16 (6.7)	10 (7.1)	6 (6.1)	

Values are frequency (percent) unless otherwise indicated

Furthermore, in assessing the differences of nutritional habits of students with and without history of aphthous lesions, none of the food groups' intake (including bread and cereals, meat and meat products, beans, oils and butter, vegetables, fruits, sugars and sweets, nuts, beverages and spices) were different between groups (P-value > 0.10 for all; Table 2). However in the univariable analyses of food types, with caution of small sample size, students with history of aphthous lesions significantly stated more consumption of Barbari bread (P-value = 0.015), vermicelli (P-value = 0.021), egg (P-value = 0.034), green beans (P-value = 0.006) and cardamom (P-value = 0.009) and less consumption of lemon juice (P-value = 0.02) but in the multivariate analyses, none of the food types independently related to the aphthous stomatitis and only having family history of the aphthous lesion and food allergy of the students was significantly related to the aphthous disease (Table 3).

Discussion

Some of the risk factors related to lifestyle and nutritional habits have been evaluated in various studies. In Iran, due to the presence of different cultures and ethnical diversity, nutritional habits are widely different but many foods in the

food pyramid are the same. The etiology of RAS is not exactly known. Some studies bring up the role of nutritional habits on the occurrence of RAS and some food items such as cinnamon, gluten, cow milk, coffee, chocolate, potato, cheese, citrus fruits, strawberry, tomato and spice were reported as possible risk factors (15-17). In the present study, none of food products has been found to be associated with aphthous lesion. The result of the present study is not in agree with the study by Hey et al regarding the effect of wheat flour on the incidence of RAS (17). In this study, food allergy and history of RAS were among the strong important predictors of RAS. This finding is in line with the studies by Slebioda et al (18) and Ujević et al (19) that evaluated the role of genetics in the pathogenesis of aphthous ulcer. Food sensitivity has shown to be as an etiologic factor in the development of recurrent aphthous stomatitis (20, 21). Therefore, Diagnostic elimination of diets causing RAs are frequently used both in diagnosis and management of RAS (22, 23). The findings of previous studies showed that some immunopotentiating activities may present in the pathogenesis of RAS. An increased levels of CD8+ T-lymphocytes and/or decreased CD4+ T-lymphocytes has been observed in patients with RAS (22).

Table 2. Dietary Intake of Study Participants According to the RAS Status

Food group	Total (n = 239)	Without RAS (n = 141)	With RAS (n = 98)	P-value
Bread and cereals	127.6 (0-649.7)	123 (23.2-649.7)	147.2 (0-649.7)	0.140
Meat and meat products	12 (0-55.5)	11.9 (3.7-55.5)	12.4 (0-55.5)	0.270
Beans	19.9 (0-352)	18.2 (0-352)	20.5 (0-281.5)	0.117
Oils and butter	10.1 (0-220.4)	9.7 (0-220.4)	10.4 (0-220.4)	0.596
Vegetables	17.4 (0-150.5)	17.3 (1.1-66.9)	18 (0-150.5)	0.575
Fruits	22.9 (0-316.4)	21.7 (2.7-316.4)	27 (0-316.4)	0.133
Dried fruits and nuts	2.7 (0-43.9)	2.6 (0-43.9)	2.9 (0-43.9)	0.227
Sugars and sweets	6 (0-43.9)	5.8 (0.1-43.9)	6.4 (0-43.9)	0.648
Beverages	53.5 (0-337.5)	53.8 (0-291.9)	53.5 (0-337.5)	0.851
Spices	3 (0-27.2)	3 (0-25)	3 (0-27.2)	0.676

Median (range) was reported

Table 3. Independent Predictors of RAS based on Multivariable Logistic Regression Model

Factors	Odds ratio	95% CI	P-value
Food allergy, yes	2.40	1.11 to 5.13	0.024
History of RAS in family, yes	4.71	2.70 to 8.22	< 0.001

Abbreviation: RAS, Recurrent Aphthous Stomatitis; CI, Confidence interval

In the present study, the most common sites of aphthous ulcer were the lips and cheek mucosa, which confirms the results of the study by Ozler et al (24).

In the assessment of smoking in the two studied groups of the present study, no significant correlation was detected between case and control groups, which is in agreement with the results of the study by Ogura et al (8). However some studies found that aphthous lesions occurs with less frequency in smokers (25). Likewise, in comparing the beverages consumption between the two groups of the present study, no significant difference was detected, which is in agreement with the results of the study by Ogura et al (8).

This study had some limitations including lack of considering oral hygiene as one of possible predictors of RAS and Recall bias resulting from measuring nutritional habits from questionnaire. Further prospective studies with larger sample size is recommended to evaluate the effect of different nutritional elements on developing aphthous stomatitis.

Conclusion

Overall, the results of this study have identified familial history of aphthous stomatitis and food allergy as the two important independent predictors of aphthous lesions. Life style were not associated with aphthous lesions. Considering that aphthous stomatitis is a multifactorial disease, There is a need to study other intervening factors and laboratory tests.

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Ethical consideration

The study protocole has been approved by the Institutional and Ethic Review Board of Guilan University of Medical Sciences with an Ethical code as 1559-94/447.

Conflicts of interests

Authors declared no conflict of interest.

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References

- Barrons RW. Treatment strategies for recurrent oral aphthous ulcers. *A Am J Health Syst Pharm.* 2001;58(1):41-50.
- Glick M. *Burket's oral medicine.* 12th ed. Shelton, CT: PMPH-USA; 2015.
- Neville BW, Damm DD, Chi AC, Allen CM. *Oral and maxillofacial pathology.* Philadelphia, PA: Elsevier Health Sciences; 2015.
- Preeti L, Magesh KT, Rajkumar K, Karthik R. Recurrent aphthous stomatitis. *J Oral Maxillofac Pathol.* 2011;15(3):252-256. doi: 10.4103/0973-029X.86669.
- Haveman-Nies A, de Groot LC, van Staveren WA. Dietary quality ,lifestyle factors and healthy ageing in Europe: the SENECA study. *Age Ageing.* 2003;32(4):427-234.
- Huling LB, Baccaglioni 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(2):149-152. doi: 10.1111/j.1600-0714.2011.01102.x.
- Subiksha P. Various Remedies for Recurrent Aphthous Ulcer-A Review. *J Pharm Sci & Res.* 2014;6(6):251-253.
- Ogura M, Yamamoto T, Morita M, Watanabe T. A case-control study on food intake of patients with recurrent aphthous stomatitis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001;91(1):45-49. doi: 10.1067/moe.2001.110414.
- Sun A, Chen HM, Cheng SJ, Wang YP, Chang JY, Wu YC, et al. Significant association of deficiencies of hemoglobin, iron, vitamin B12, and folic acid and high homocysteine level with recurrent aphthous stomatitis. *J Oral Pathol Med.* 2015;44(4):300-305. doi: 10.1111/jop.12241.
- Lopez-Jornet P, Camacho-Alonso F, Martos N. Hematological study of patients with aphthous stomatitis. *Int J Dermatol.* 2014;53(2):159-163. doi: 10.1111/j.1365-4632.2012.05751.x.
- Guthrie J, Mancino L, Lin CTJ. Nudging consumers toward better food choices: policy approaches to changing food consumption behaviors. *Psych & Mark.* 2015;32(5):501-511. doi: 10.1002/mar.20795.
- Welsh S, Davis C, Shaw A. Development of the food guide pyramid. *Nutr Today.* 1992;27(6):12-23.
- Willett WC, Sacks F, Trichopoulos A, Drescher G, Ferro-Luzzi A, Helsing E, et al. Mediterranean diet pyramid: a cultural model for healthy eating. *Am J Clin Nutr.* 1995;61(6 Suppl):1402S-1406S. doi: 10.1093/ajcn/61.6.1402S.
- Malekshah AF, Kimiagar M, Saadatian-Elahi M, Pourshams A, Nouraei M, Goglan G, et al. Validity and reliability of a new food frequency questionnaire compared to 24 h recalls and biochemical measurements: pilot phase of Golestan cohort study of esophageal cancer. *Eur J Clin Nutr.* 2006;60(8):971-977. doi: 10.1038/sj.ejcn.1602407.
- Calderon PE, Valenzuela FA, Carreno LE, Madrid AM. A possible link between cow milk and recurrent aphthous stomatitis. *J Eur Acad Dermatol Venereol.* 2008;22(7):898-899. doi: 10.1111/j.1468-3083.2007.02542.x.
- Eversole LR, Shopper TP, Chambers DW. Effects of suspected foodstuff challenging agents in the etiology of recurrent aphthous stomatitis. *Oral Surg Oral Med Oral Pathol.* 1982;54(1):33-38. doi: 10.1016/0030-4220(82)90414-5.
- Hay KD, Reade PC. The use of an elimination diet in the treatment of recurrent aphthous ulceration of the oral cavity. *Oral Surg Oral Med Oral Pathol.* 1984;57(5):504-507. doi: 10.1016/0030-4220(84)90308-6.
- Ślebioda Z, Szponar E, Kowalska A. Recurrent aphthous stomatitis: genetic aspects of etiology. *Postepy Dermatol Alergol.* 2013;30(2):96-102. doi: 10.5114/pdia.2013.34158..
- Ujević A, Lugović-Mihčić L, Situm M, Ljubesić L, Mihčić J, Troskot N. Aphthous ulcers as a multifactorial problem. *Acta Clin Croat.* 2013;52(2):213-221.
- Wray D, Vlagopoulos TP, Siraganian RP. Food allergens and basophil histamine release in recurrent aphthous stomatitis. *Oral Surg Oral Med Oral Pathol.* 1982;54(4):388-395. doi: 10.1016/0030-4220(82)90384-X.
- Nolan A, Lamey PJ, Milligan KA, Forsyth A. Recurrent aphthous ulceration and food sensitivity. *J Oral Pathol Med.* 1991;20(10):473-475. doi: 10.1111/j.1600-0714.1991.tb00406.x.

22. Wardhana, Datau EA. Recurrent aphthous stomatitis caused by food allergy. *Acta Med Indones.* 2010;42(4):236-240.
23. Yasui K, Kurata T, Yashiro M, Tsuge M, Ohtsuki S, Morishima T. The effect of ascorbate on minor recurrent aphthous stomatitis. *Acta Paediatr.* 2010;99(3):442-445. doi: 10.1111/j.1651-2227.2009.01628.x.
24. Özler GS, Akkoca AN, Cevik C ,Yengil E. Relationship of Recurrent Aphthous Stomatitis with Nutritional Habits. *J Clin Anal Med* 2015;6(6): 729-732. doi: 10.4328/JCAM.2412.
25. Subramanyam RV. Occurrence of recurrent aphthous stomatitis only on lining mucosa and its relationship to smoking--a possible hypothesis. *Med Hypotheses.* 2011;77(2):185-187. doi: 10.1016/j.mehy.2011.04.006.