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Recurrent Aphthous Ulceration Prevalence And The Factors Associated with It Among Dentistry Students /Tikrit University

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Abstract. Backgroun: The most prevalent condition affecting the mucosa of the oral cavity is recurrent aphthous stomatitis (RAS), also called canker sores. Individuals with RAS cannot avoid it, in contrast to patient with periodontal disorder and dental caries. The feature RAS clinical picture is identified by recurring bouts of painful ulcerations which appear either single or multiple in different site in the mouth that include lips, buccal mucosa, tongue, and soft palate in the mucosa that are not keratinized. Frequently appear spherical, unpleasant, and covered by a yellowish-gray fibromembranous thin layer, with a read boundary Despite the present of. numerous recommendations, there is still no exact treatment for recurrent phathous canker because the origin etiology is still controversial and its occurrence is affected by a variety of factor. Objectives: This study sought to evaluate the prevalence of recurrent apathies stomatitis and associated risk factors clinically. Method: This cross sectional study used as ample of 220 participants from the University of Tikrit's dental school. Every patient made an interview and as well as an oral cavity examination. During an interview Details were evaluated such as risk variables, using a distinct questionnaire that encompass characteristics of the study individual frequency of ulcer occurrence gender, age, class. Descriptive and inferential analyses and. association were included in the statistical study.X2 statistics were used to test relationships between the variables. Results: high prevalence of canker sores in female 64.3%. stress, diet and family history was the most frequently risk condition (82.6%) (79.1%) (69.8%, respectively). by patients, followed by diet and family history (79.1% and 69.8%, respectively). No statistical relation was found with trauma. Product of Tobacco using is related to aphthous development (p value less than 0.05). Conclusions: It was conducted that the prevalence of ulcer is high among dentistry student and the stress, diet and history of family are the most common risk condition.

Highlights:

1. Recurrent aphthous stomatitis causes painful oral ulcers with unclear etiology.
2. Examined 220 dental students; analyzed risk factors via questionnaire and oral exams.
3. High prevalence in females; stress, diet, and genetics are key risks.

Keywords: Aphthous Stomatitis. Risk Factors. Prevalence

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Introduction

Oral mucosal lesion such recurrent aphthous ulcer are most common lesion but not well understood. Tissue damage that occur in RAS is linked to a compromised balance of oxidant/antioxidant. (Hussein ,2016). RAS start as a burning or tingling feeling at the ulcer location and, in a many days, develop into an oval yellow or white lesion with a red inflamed border around it. Moreover, aphthae might manifest as a lesion that occur in conjunction with some disorder such as malabsorption disease like as Crohn's and Celiac diseases, and also with systemic illness such as Bacet's syndrome. Like this epithelial damage can be occur as a result of trauma, immunological defect(lichen planus, pemphigoid, or pemphigus), immune system malfunction (leukemia, HIV illness), infectious disorder such as (syphilis, herpes viruses, and tuberculosis), malignant tumor , and nutritional problem . When eating the diet that are spicy or citrus fruit Couse discomfort or soreness generate the because the nerve terminals exposed by action of epithelium lesion. (Chattopadhyay and Chatterjee, 2007) Thesymptoms of this disorder can be moderate to severe form, increases malnutrition risk. An iron deficiency anemia is characterized by small and abnormally appearing red blood cells (microcytic) and deficient hemoglobin levels (hypochromic), that caused by defect that occur in the production of hemoglobin, Consequently, impaired the blood's capacity to oxygen supply to tissues and cells. mucous lining of the gingivae and mucogingival area may be involved by this inflammatory lesion. The prevalence of aphthous ulcer is a 5-25% and it is primarily depending on the study population, Studies appear that is the ulcer is more common in adult women, people those under 40 years, nonsmokers,White people and people from higher backgrounds socioeconomically. (Chun-Pin et al.,2016). canker sores, is categorized as a noncontagious infectious state that should be involve a healthy mouth.(Rivera ,2019) (Manoj et al .,2023) The name of"aphthous ulcer" initiation is originates and came from word "aphtha," that is Greek that meaning ulcer. Which is benign ulcerated disorder are mostly appear on the oral mucosa , (Hamedi.,et al 2016) RAS clinically manifests as appearing of recurrent episodes in the mouth of one or more ulcerations which very hurt and have with no systemic illnesses relation. (Rivera ,2019)

This lesion is appearing as a circular abrasion or ulceration on the mucosa of oral and genital area, that ranging from 2 to 5 mm. with thin Fibrinous membrane covers,

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and it is commonly take 10 to 15 days to heal, but they reoccurring again. ulcerations Couse discomfort and pain and the symptoms become worse by eating. (Giannetti et al.,2018) Before the appearance of the ulcers, the burning sensation appear for two to forty-eight hours. (nchez et al., 2020) a seven out of ten persons. are in life RAS exposed. (Rivera ,2019) Numerous factore including trauma or injury, dietary deficiencies, genetic predispositions, allergies, low levels of vitamin D and iron, hormonal impacts, consider the triggering factor, can cause this lesions.And this factor varies and differs from person to person, RAS also exist with some inflammatory condition , and this ulcer occasionally occur and between outbreaks heals fully . (Manoj et al .,2023) roughly 1% of children affected by RAS from those with high backgrounds socioeconomically in developed countries, and it is account 5–66% of the community (Akintoye et al ., 2014) The etiopathogenesis of RAS is unclear and in question ,but it is consider multifactorial disorder and the majority of the individual with this lesion have primary type of the lesion , various inflammatory, nutritional, toxic, and metabolic factor that can affect to the pathophysiology state of the disorder.(Chun-Pin Chiang et al ., 2016)(Shah et al .,2016) (Darjani et al 2021) Certain findings from earlier research indicate the disruption that genetically mediated in the both type of immunity (specific and nonspecific, acquired and innate) play the important part in the development of this lesion .(Chun-Pin Chiang et al ., 2016) genetic alteration , mechanical trauma, allergies, vitamin insufficiency, infections that include viral and bacterial ,and immune system disorder that cause defect in the Oral microbiome, smoking, and endocrine disorders, all this factor consider as the triggering agent of the RAS .(del Mazo et al., 2023)

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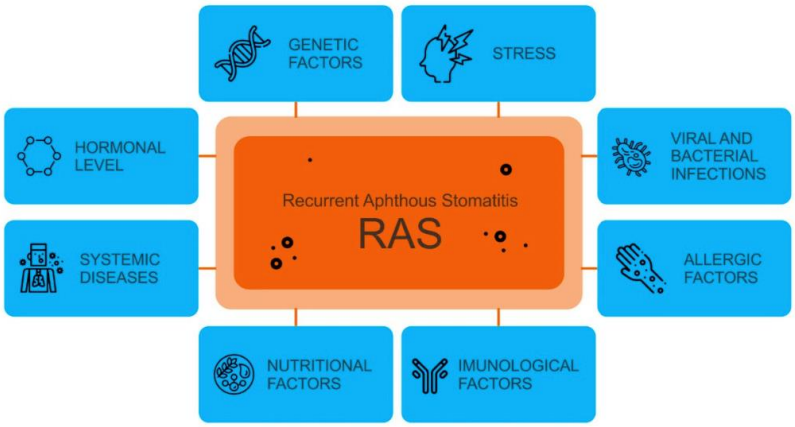
Figure 1. Recurrent Aphthous Ulcer in the labial oral mucosa and latral of the tongue.

Figure 2. Predisposing aetiological factors of RAS



There are three main forms of aphthous ulcers that are defined by: I. The size of the aphthous ulcer

II. The number of ulcers that are present simultaneously

III. The time required for the ulcer to heal IV. If the ulcer causes any scarring after healing. aphthous stomatitis are classified according this feature to three main types: (Bilodeau and Lalla R ,2019).

I. The size of this ulceration

II. Numbers that are present at the same time

III. The healing time.

IV. If leaves any scare after the time of healing.

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The Three main type of ulcer include: (Chianget al., 3019)

I. Minor type

II. Major type

III. Herpetiform type

Minor Aphthous Ulcer:

Minor aphthous ulcer is the type of the lesion that consider most common and affect approximately 80% of individuals with RAS, which have circular or oval shape and smaller than 10 mm in size.

This lesion appear occasionally and range from 1 to 6 lesions and causing minimal symptoms,

the ulcer have a yellow floor at first then turn to gray after the epithelialization and healing, this type of ulcer mainly occur on the non- keratinized part of oral mucosa like the floor of the

mouth, labial and buccal mucosa, typical healing of minor ulcer occur within two week without a scar on the surface, but some discomfort may be remainon the area after disappearing of the lesion. (Zadeh et al., 2022) (Talarico et al 2010)

Figure 3: minor aphthous ulceration (44)

Major Aphthous Ulcer.

This type of aphthous is also known as periadenitis mucosa necrotica recurrent this is the

Most sever one of three type, occur in 10% of patients with RAS, they have high recurrence, duration is longer, size bigger and more hurtful than minor type, the diameter of ulcers is larger than 10 mm associated with longer healing period take about

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10 to 40 days and heal with scars, they can be developing on any part of oral cavity like palate and the dorsum surface of the tongue, this type of ulcer has higher frequency rate and consider the most common type of RAS that found in I DS patients. (Zadeh et al., 2022) (Talarico et al 2010)

Figure (4) Major aphthous ulcer (45)

Herpetiform Aphthous Ulcer.

This is the type of RAS that are rarest and least common one , it occurs and affecting nearly 1-10% of patients with RAS, older age female individuals are more commonly affected with Herpetiform Aphthous Ulcer, name of this type derivied from its similarity to primary herpetic stomatitis but there's no association with herpes viruses , any sites of the oral cavity may be affected with keratinized mucous , the ulcer are more painful and Nemours they may be 10 to 100 in number ,Small in size about 2 to 3 mm in diameter and they are very painful , these small ulcer coalescence and form larger irregular ulcer that makes a scar after healing process. (Zadeh et al., 2022) (Talarico et al 2010)

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Figure 5: herpetiform aphthous ulcer (46)

Methods

In this study the sample size was 220 dentistry students at Tikrit University of Dentistry. The all participants in this cross-sectional study was include the students that have information about this disorder. written consent was taken from all participants before administering the questionnaire. A questionnaire was designed by researchers based on comprehensive and extensive review of literature. The questionnaire includes two sections. The first one includes questions about the participant's demographic characteristics like age, gender, and class. The second part include 5 questions about the RAS occurrence, family history, food, stressful condition, trauma and smoking.

Statistical analysis:

Statistical Package for Social Sciences (SPSS) version 22 for windows used for data were statistically computerized. The prevalence of RAS, frequencies, percentages of variable and connection between categorical variables made by using the compared with chi-square test frequencies. the statistical significance P-value is <0.05.

Result and Discussion

A total of 220 student took a part in our study about 67.27 % participant were females and 32.72 % were males, the age ranged from 21 -28. Among 220 participants 148 (64.09%) were in fourth grade and 79 (35.09%) were in fifth grade in dentistry college. table (1) prevalence of ulcer account 39 % (n=86) about more than half of them

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(n=60; 69.8%) record having family history of ulcer involvement, also (n=68; 79.1%) from the participant exhibit certain type of diet

Was consider the main cause for involvement by ulcer. additionally, about (n= 49; 57%) consider the trauma as agitating factor for ulcer occurrence. while (n=71 ;82.6%) mention that stress was the reason their ulcer. Few of the respondents (n=20;23.3%) experienced AU due to smoking. table (1) and table (2).

Table.1 characteristics of participant.

Groups	**men**		**Women**		**Total**
	N	**%**	**N**	**%**	
Age group					
21 – 24	**60**	**83.3%**	**141**	**95.27%**	**201**
25 – 28	**12**	**16.6%**	**7**	**4.73%**	**19**
Grade					
4th stage	**40**	**28.36%**	**101**	**71.63%**	**141**
5th stage	**32**	**40.5%**	**47**	**59.49%**	**79**

In Chi-square test using appeared that sex and trauma did not have statistical relation with ulcer ($p>0.05$). while, eating some type of diet ($\chi2 = 58.14$; $p>0.05$), history of family member ($\chi2 = 26.88$; $p<0.05$), stress ($\chi2 = 72.92$; $p <0.05$) and smoking ($\chi2 =49.209$; $p<0.05$) has statistically significant relation with ulcers (Table 2).

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Table.2 A number of related Factors with Aphthous stomatitis.

Variables		R A U		Pearson Chi-Square	P-Value
		Yes	No		
Gender	Male	32 (65.3%)	17 (34.7%)	$\chi^2 = 0.014$ ns	0.905
	Female	54 (64.3%)	30 (35.7%)		
Diet		68 (79.1%)	18 (20.9%)	$\chi^2 = 58.14$ **	0.00002
Stress		71 (82.6%)	15 (17.4%)	$\chi^2 = 72.92$ **	0.00003
Smoking		20 (23.3%)	66 (76.7%)	$\chi^2 = 49.209$ **	0.00001
Trauma		49 (57.0%)	37 (43.0%)	$\chi^2 = 3.349$ ns	0.072
Family History		60 (69.8%)	26 (30.2%)	$\chi^2 = 26.88$ **	0.0008

Discussion:

Ulceration of aphthous is most frequent disorder occur in oral mucosa, and consider as a certain cause of distressing, suffering and pain. also making the daily living activities very difficult such as eating and swallowing. Studying of recurrent aphthous ulceration prevalence is very important crucial for understanding the condition's prevalence and potential causes. This research showed that RAU prevalence about 39% of dental students at Tikrit University .86 dental students out of 220 give history of RAU. It also showed a female predilection as 54 (64.3%) then in male (35.7%). Also it was more common in 21 – 24 years' age group. These result agree with a study done by (Al-Johani ,2019).

The result of this study in relation to prevalence was more in Saudi Arabia and about (14%) among dentistry students in research conducted by (Ajmal M, 2018), and the prevalence less than that in Jordan (78%) in study done by (Safadi ,2019). Comparison the result of the current study when carried out with other work should be made carefully and take in to account the variation in geographical area, design of study, sample size. This could be attributed to the variation in genetic, stress, trauma, and many risk condition. In relation to gender distribution this study shows a high prevalence of RAS in females about 54(64.3%) and this finding agree with most of

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research that show female predilection, this association may be linked to hormonal effect like premenstrual period, pregnancy, or menopause as suggested by (Ajmal et al., 2018).

In the finding of current research, although establishing the ulcer in females more than male, but not supported statistically any relation between this disorder and gender (C Jr et al,2010). thereby corroborating the findings that reported by Chattopadhyay and Chatterjee, 2007) who found the lack of relation between RAS and gender. According to Bilodeau EA and Lalla RV have suggested that RAS may cause in response to various factors including immunological defect, genetic disorder, injuries, stress, allergic and hormonal disturbances, family history and certain dietary components (Bilodeau and Lalla R 2019). The food such as acidic ,hoot spicy food in this work consider important triggering factor for ulcer development and the relationship was statistically significant, corroborating the research that has been found that cow's milk protein can trigger RAS, supporting previous study research indicates that some diet , like tomatoes, oranges, lemons, and pineapple, protein of cow's milk ,carbonated beverages, and fried foods can trigger a proinflammatory cascade, and cause RAS(Rathod et al. , 2017) (DU Q et al ., 2018) (Taheriet al. ,2022).

Additionally, researchers showed B1, B2, B6, B12 and iron vitamin D, folic acid, hemoglobin, and ferritin deficiencies can be participating in epithelial cell and immune system disturbances, which lead to induce RAS (Bao et al., 2018). (Queiroz et al.,2018) (Al-Maweri et al., 2019) (Al-Amad and Hasan ,2020) (Kaiyuan et al., 2021)

this study indicates there is high statistical significance relation found between family history and RAS development. That agree with A number of studies have indicate that there is afamiliar development of RAS and the relation is more in identical twins indicating the genetic effect on the incidence. additionally, approximately 50% of relatives that in first degree get RAS, supporting the result of study done by (C Jr et al, 2010).

in relation to trauma, this research considers a trauma as important triggering condition for ulcer. But there is no statistical relationship found, and this fining does not agree with (Taheri et al., 2022) who found that the Injury was the important factor that responsible for the development of ulcer (C Jr et al, 2010) (Rathod et al, 2017). Other study also demonstrates that trauma as risk agent for RAS like the injuries that occur by

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dental treatment, injection, hard sharp diet, and brushing the teeth aggressively which effect on the oral tissue. (Rathod et al, 2017) (Taheri et al., 2022).

The literature review show that the RAS development have a reverse relation with tobacco using because the smoking considers as protective factor for oral mucosa (Ussher et al.,2023) Although this association was not identified in our study, and it was impossible to understand this association because lack of more information.

In number of previous studies that have shown a smoking have protective role against aphthous stomatitis and number of study indicate that the ulcer development more in people which didn't smoke all the life than those who take during the day higher than10 cigarettes, this as a result of harmful toxic component which produce parakeratin, that responsible for making the oral mucosa thicker and more resistant. (Queiroz et al.,2018)

Nicotine is known to improve immune response in inflammatory circumstances which inducing increase in adrenal steroids via hypothalamus–pituitary–adrenal axis and decreasing the interleukins 1 and 6 and TNF-α by its blunt action on the macrophages, many researchers explained that by the smokers may be less undergo to stress than those non-smokers and indicate that many psychological factor lead to RAS development. (Manoj et al.,2023)

This study agrees with the result of (Ussher et al.,2023) which show that after Smoking for one week and two weeks the number of RAS notable increase.

In relation to psychological profile of RAS patients, the finding in our research indicate that anxiety and tension consider as an important cause that bring about and promote the emergence of RAS, and there's high significant difference. (Rathod et al , 2017) (Ajmal et al . , 2018) (Darjani et al .,2021).

also found increase prevalence of RAU in people who are under stressful situations, the researcher explains that by the salivary cortisol concentration become higher under stressful condition which cause continues triggering of the defense mechanism of immunity in order to attract and migration of white blood cells to the area of inflammation, so this providing crucial role in the production, development and progression of RAS (Queiroz et al.,2018)

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A study by (Sharmaet al., 2017) in India and Mohammed Ali et al 2019) in Tikrit and (Taheri et al., 2022) in Kabul revealed and found that the RAS prevalence increase in those individual with severe stressful state more than those without stressful condition. at last Given the constraints of this research, like time constraints, small funding, the impact of systemic disorder on the RAS incidence not assessed. Our research carried out in a limited particular condition and the sample possibly not represent whole community, additional Studies are required with the sample size is large

Conclusion

1. The medical students exhibit high aphthous Prevalence (39%) in College of Dentistry
2. Women are more frequent affected than men.
3. Dental student's ulcer is statistically linked to stress, family history, dietary habit, and smoking

Suggestions

1. Making follow up and check healing time for every patient and determine the effect of predisposing factor on healing time.
2. Comparison of prevalence and stressful effect on frequency of RAS between dental students during dental clinic and students of other collage.
3. Follow up for the patient and make comparison between two material used in treatment and checking efficacy and healing time under the same condition

Recommendations

Since diet is one of the most common causes of RAS among the participants we recommend reducing the intake of food that will cause the ulcer, and avoid hot, spicy, acidic or salty food. Keep the mouth clean plays an important role in its healing, treatment with mouth rinse may reduce pain and speed the healing process, the main goal is to reduce the symptoms of the lesion and elimination of the predisposing factor

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