

The Burden of Recurrent Aphthous Stomatitis in Patients Attending a Tertiary Hospital in South-East Nigeria

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ABSTRACT

Background: Recurrent Aphthous stomatitis (RAS) is one the most common oral mucosa diseases worldwide, however, there is scant literature describing the burden of this condition in Nigerian populations.

Objective: To assess the prevalence, age, and sex distribution of the various subtypes of RAS among patients accessing dental care in Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Ebonyi State, Nigeria.

Methods: A retrospective study was carried out among patients attending the Dental clinic of the Alex Ekwueme Federal University Teaching Hospital from January 2022 to September 2023. The primary source of data was the case notes of all the patients who attended the clinic during the study period. Data from patients with recurrent aphthous ulcers was collected and analyzed with IBM SPSS version 25.0 software. The association between age and gender distribution among patients was analyzed using the Chi-squared test. The level of significance was set at $P < 0.05$.

Results: The prevalence rate of RAS was 8.8% comprising 198 cases of which 144 (72.7%) were females and 54 (27.3%) were males. The mean age of the RAS patients was 31.5 ± 2.32 years; the majority [112 (56.6%)] were in the age bracket of 21 – 30 years old. A total of 165 (85.4%) cases were of the Minor subtype; 21 (10.6%) had the Major subtype while 12 (6.0%) were of the Herpetiform subtype. The relationship between the age group and the subtype of RAS was found to be statistically significant ($P=0.001$), with the 21-30 age group having the highest proportion ($n=101$; 61.2%) of the Minor RAS subtype.

Conclusion: There is a significant health burden of RAS in South-eastern Nigeria, with an overall prevalence of 8.8%. There is a preponderance of RAS amongst females in the third decade of life with the Minor subtype as the most common.

Keywords: Recurrent Aphthous Stomatitis, Prevalence, Oral Mucosa, Nigeria.

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CLINICAL IMPLICATIONS

This study on the Burden of Recurrent Aphthous Stomatitis (RAS) has significant clinical implications because RAS is a common condition characterized by recurring ulcers in the oral cavity. The study's findings can inform clinicians about the importance of:

- Early diagnosis and treatment to reduce symptom severity and improve quality of life of the patients.
- It will help in identifying and managing underlying triggers, such as stress, nutritional deficiencies, and hormonal changes
- It will also help in developing personalized treatment plans, including topical and systemic therapies, to address the unique needs of RAS patients.

INTRODUCTION

Recurrent Aphthous Stomatitis (RAS) is one of the most prevalent mucosal diseases of the oral cavity.^{1,2} RAS constitutes a significant disease burden as studies have shown that RAS affects approximately 20-25 % of the general population.^{2,3,4} However, environmental, socio-economic as well as ethnic factors can affect the prevalence of RAS, with some studies indicating population occurrences ranging from 5 - 66 %, ^{3,4} with the disease more prevalent among females. RAS is characterized by an inflammatory disorder of the oral movable mucosa with the recurrent onset of single or multiple painful ulcers with well-defined erythematous margin and yellowish-gray pseudomembranous center and non-specific histological presentation that can affect several parts of the oral mucosa.⁵⁻⁷

The symptoms of RAS are variable; a prodromal burning sensation lasting 24 to 48 hours often precedes the appearance of ulcers. The ulcers are painful and the natural course is one of eventual remission. ^{1,2,5} The clinical features of RAS are dependent on their depth, number in one episode, location, and duration. According to these features, RAS is clinically categorized into three main

categories; Minor, Major, and Herpetiform RAS.^{5,8} The most frequent type is the Minor RAS which makes up $\geq 80\%$ of all RAS cases.² Minor RAS are usually smaller than 1 cm in diameter, shallow, painful, well-circumscribed, and round-shaped ulceration covered by a yellow-grayish pseudo membrane and surrounded by an erythematous halo.^{2,8} The ulceration generally heals without scarring after 10 to 14 days. Major RAS are deeper than minor RAS, and are typically single and larger (1 to 3 cm) lesions that majorly affect the soft palate and tonsillar faucets, and heal slowly within 2 to 6 weeks with scarring. Herpetiform RAS ulcers manifest as multiple recurrent clusters of small ulcers (less than 4 mm) that are scattered throughout the oral mucosa. These ulcers have short healing periods similar to the minor RAS and may further coalesce into larger ulcerations.⁸

RAS is not a life-threatening disease, but it can negatively impact the mental health and quality of life of sufferers. With a recurrence rate as high as 50%,^{5, 10}. RAS is a disease condition that can result in repeated hospital visits with its consequent financial cost on the part of the patient and strain on limited health resources. Consequently, it is important to effectively control the incidence of RAS, which necessitates the need for local studies which are currently scant, to characterize the burden and clinical manifestations of this mucosal disease in Nigerian populations. Therefore, this study aims to assess the prevalence, age, and sex distribution of the various subtypes of RAS among patients utilizing dental services in Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Ebonyi State, Nigeria.

MATERIAL AND METHODS

This retrospective cross-sectional study was conducted among patients attending the Dental clinic of the Alex Ekwueme Federal University Teaching Hospital from January 2022 to September 2023. Our diagnostic protocol for Recurrent

Aphthous Stomatitis (RAS) was based on clinical history and examination, using the following criteria: medical history was taken to ask about frequency, duration, and severity of episodes, physical examination was conducted to assess oral lesions, size, shape, location, and number, and symptom assessment was evaluated to assess pain, discomfort, and difficulty eating/speaking. The diagnostic criteria included recurrent episodes of oral ulcers, at least 3 episodes in a 12-month period, and ulcers that are typically round or oval, 1-10 mm in diameter, shallow with a yellowish or grayish base, and surrounded by an erythematous halo. RAS was classified into minor RAS (small, shallow ulcers <10 mm but > 5mm), major RAS (larger, deeper ulcers >10 mm), and herpetiform RAS (multiple small ulcers < 5mm). The primary source of data was the case notes of all patients who attended the clinic during the study period, and demographic data such as sex and age, as well as the type of RAS, were collected. Data was analyzed using IBM SPSS Statistics version 25.0, and descriptive analysis was presented in contingency tables using frequencies and percentages. The Chi-square test of association was

applied to analyze the relationship between variables, with statistical significance set at $P\text{-value} \leq 0.05$.

RESULTS

A total of 2,256 patients visited the Dental clinic during the study period, out of which 198 had RAS, which gives a prevalence rate of 8.8%. Of the 198 cases, 144 (72.7%) were females and 54 (27.3%) were males, which gives a female-to-male ratio of 2.7:1. Majority of the patients: 112 (56.6%) were in the age bracket of 21 – 30 years old, the mean age of the study respondents was 31.5 ± 2.32 years (Table 1). A hundred and sixty-five cases (85.4%) of the RAS patients were found to have the minor subtype; 21 (10.6%) had the major subtype while 12 (6.0%) were found to be of the herpetiform subtype. The relationship between sex and RAS subgroup was not found to be significant at $p = 0.519$ (Table 2). However, the relationship between the age group and the subtype of RAS was found to be statistically significant ($P=0.001$), with the 21-30 age group having the highest proportion ($n=101$; 61.2%) of the Minor RAS subtype (Table 3).

Table 1: Age and Gender Distribution of Recurrent Aphthous Stomatitis Patients

Age Category	Sex		Total
	Male (N=54)	Female(N=144)	
≤ 20	10(18.5%)	8(5.6%)	18(9.1%)
21- 30	17(31.5%)	95(66%)	112(56.6%)
31 – 40	11(20.4%)	14(9.7%)	25(12.6%)
41 – 50	9(16.7%)	17(11.8%)	26(13.1%)
51 – 60	4(7.4%)	7(4.9%)	11(5.6%)
>60	3(5.6%)	3(2.1%)	6(3%)
Mean Age	31.5 ± 2.32 years		

Table 2: Gender Distribution of the subtypes of Recurrent Aphthous Stomatitis

Subtype of RAS	Sex		Total	
	Male (N=54)	Female(N=144)		
Minor	43(79.6%)	122(84.7%)	165(85.4%)	Fishers = 1.488 $P=0.519$
Major	8(14.8%)	13(9%)	21(10.6%)	
Herpetiform	3(5.6%)	9(6.3%)	12(6.0%)	

Table 3: Age Distribution of the subtypes of Recurrent Aphthous Stomatitis

Age groups	RAS subtypes			Total	
	Minor (N=165)	Major (N=21)	Herpetiform (N=12)		
≤ 20	15(9.1%)	3(14.3%)	0(0%)	18(9.1%)	Fishers = 26.800 P=0.001
21- 30	101(61.2%)	7(33.3%)	3(27.3%)	112(56.6%)	
31 – 40	20(12.1%)	4(19%)	1(9.1%)	25(12.6%)	
41 – 50	21(12.7%)	4(19%)	1(9.1%)	26(13.1%)	
51 – 60	5(3%)	2(9.5%)	4(36.4%)	11(5.6%)	
>60	3(1.8%)	1(4.8%)	2(18.2%)	6(3%)	

DISCUSSION

Several epidemiological studies have been conducted over the years with geographical variations in the spread of the prevalence of RAS. A primary justification of this study was the need to add to the scant literature on the burden of RAS in Nigeria, as studies have indicated the effect of socio-demographic and ethnic factors on the prevalence of RAS. The raw number of RAS occurrences in the study population of 198 is the highest reported within two years in Nigeria. Previous studies like Okoh et al² reported a raw figure of 22 (out of 304 patients) over three years at the University of Benin Teaching Hospital, while Oyetola et al¹¹ reported a figure of 41 cases of RAS over 5 years at the Obafemi Awolowo University Teaching Hospital, Osun state. However, the prevalence rate of 8.8% is lower than the prevalence rate of 16.4% derivable from the data reported by Oyetola et al,¹¹. Still, it is higher than the 7.2 % reported by Okoh et al.² The relatively low rate of 8.8 % recorded in this study given the high occurrence of 198 when compared to the other Nigerian-based studies study by Oyetola et al¹¹ and Okoh et al² can be adduced to the fact that the other studies were based on the number of patients referred to the Oral medicine clinic. In contrast, in the case of this study, as there is no dedicated oral medicine clinic as yet, the RAS rate was based on the total number of patients visiting the Dental department in a Teaching Hospital in a state through the study period.

Nonetheless, the prevalence rate in this study is also higher than the rate reported by Hedge et al¹²(1.9%) and Malayil et al¹³ (0.48%), which were hospital-based studies among a rural population in India who presented to a dental clinic. It is obvious that the population in this study as well as in other Nigerian-based studies are higher than that recorded in South Asian Indian populations. In contrast, however, the prevalence in this study is lower than that recorded in

Abdullah et al¹⁴(28.2%); Ziaei et al⁵ (54%), Taheri et al¹⁵(30%); Dovatchi et al.¹⁶ (25.2%), Akbar et al.,¹⁷ (38.6%) and Al-Johan et al.¹⁸ (39%). The difference in findings would be related to study design, differences in study populations in terms of genetic predisposition, stress, lifestyle, and other related factors, sample size, and methodological issues, for instance in the study by Ziaei et al⁵, the high prevalence in their present study was attributed to the method of measuring prevalence both with clinical examination and questionnaire, which may have resulted in mistakes in other lesions with RAS.

In this study there was a high female preponderance in the number of RAS cases, as females constituted 72.7% of the cases; although there was no significant association with the subtype of RAS ($p=0.519$). This finding agrees with that of most investigators in agreeing that RAS affects females more than males, for example Rodríguez-Archilla et al had more females at (60%); Abdullah et al.¹⁴, found it was highly significantly more common among females (31.76%; $p<0.004$); Hedges et al¹² reported 51.6% of female RAS cases Malayil et al¹³ reported a female majority of 56%. This finding of female predilection for RAS is corroborated by most of the existing literature; where some authors have suggested that this association is related to hormonal rates is related to the luteal phase of the menstrual cycle and also a decrease in its incidence during pregnancy, thus relating the episodes of RAS to progesterone levels.² Furthermore, research has shown that serum and salivary estrogen during menstruation and pregnancy transmits RAS into the active phase.¹⁹ However studies like Okoh et al²; Omoregie et al and Ziaei et al⁵ all found a male preponderance in their studies and Majorana et al.¹² found in Italian children < 12 years, with a slight predominance of the male gender.

The mean age of the study population in this study was 31.5 ± 2.32 years, with over half of the RAS

patients in the study in their third decade. Although adult predominance was evident in this study, studies have shown that the peak age¹² for the onset of RAS is in the second decade with a general trend of low RAS prevalence in the first decade with an increase in the prevalence of RAS in the second and third decades. The adult higher prevalence in this study may be attributed to the predisposing factors of stress, hormonal changes, trauma, and specific food intake.¹² The age distribution of RAS where persons in their third decade were most affected was supported by studies like Hedges et al¹², Patil et al²², Okoh et al², and Abdullah et al.¹⁴

In terms of mean age, the mean age of 31.5 ± 2.32 years, in this study is slightly higher than the 29.94 ± 11.42 in Hedges et al.¹², however, it was lower than the 34.27 ± 14.14 in Abdullah et al.¹⁴, 13.3 ± 4.1 of Okoh et al.,² and the mean age of 34.20 ± 13.77 years in Rodríguez-Archilla et al.¹ these slight variations in mean age, could be related to the difference in studies' population ethnicity and measurement tool.⁵ In this study, the majority of the RAS [165;85.4%] were of the minor subtype. This is well supported by literature that minor RAS is the most common subtype worldwide.^{2,20,23,24} The percentage in this study is less than the 100% observed by Rodríguez-Archilla et al¹ and 94% in Kerala, India¹²; but higher than the 64.8% in Ziaei et al⁵; 50% reported by Okoh et al² and the 72% in the Libyan study.²⁵

There was a significant association between age and RAS subtype. With the most frequent subtype being the Minor subtype coupled with the female preponderance this statistical significance could be explained by the fact that the most predominant age category was the younger age category of 21-30 (56.6%) where female hormonal rates connected with activating RAS are at their peak. Furthermore, the Herpetiform subtype of ulceration which is often extremely painful and the lesions recur more frequently than minor or major aphthous ulcers seemed to occur more in the older age categories in this study.

CONCLUSION

The study showed that there is a significant health burden of RAS in South-eastern Nigeria, with an overall prevalence of 8.8 % of RAS comprising 198 cases seen within a two-year period. Findings also showed that there is a female preponderance of RAS with the condition affecting the third decade of life mostly in the study population, with the Minor

subtype being the most common. The study also showed that there is a significant relationship between age and the RAS subtype.

RECOMMENDATION

RAS is the most common disorder of the oral mucosa, with a significant burden in the local population under study. It is recommended that with RAS-specific etiology and pathogenesis remain unclear, there is a need for more local studies to characterize its pathogenesis, etiological risk factors, and triggering factors in Nigerian populations in the bid for better and timely therapeutic management of the condition.

STUDY LIMITATIONS

A major limitation of this study is the retrospective nature of this study which precluded the eliciting of information such as the age of first onset, etiological as well as pre-disposing factors.

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