

## Original Research Article

## Association of Recurrent Aphthous Ulcer (RAU) with Stress among Individuals in Northern Part of Nigeria

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**Abstract:** Considering the issue of recurrent aphthous ulcers affecting individuals worldwide, knowledge of the significant associating triggering factor is an essential tool, which can be used to figure out the most challenging factor behind that can be further controlled or avoided in an effort to reduce the chance of re occurrence by taking proper precautions. This paper evaluates the association of recurrent aphthous ulcers with stress and other possible triggering factors such as Allergy and diet, among individuals in the northern part of Nigeria, represented by 4 states which include, Kano, Zamfara, Maiduguri and Katsina states respectively. Age, occupation, gender, history of re occurrence, site of occurrence in the oral cavity, number, duration of ulcers and nature of healing were highly considered in the study. 75 structured questionnaires were distributed among individuals of both genders, out of which 71 were retrieved and 4 left unanswered. The research methodology uses both correlation and descriptive statistical analysis. Following data analysis, using correlation table, there is weak correlation between Aphthous ulcer and stress with .012 covariance. The results were analyzed using SPSS 25.0 VERSION and displayed in the form of Graph and tables. In conclusion, necessary preventive measures were outlined and further research recommendation is suggested in light of creating more awareness about the effects and importance of prevention to be considered by the society.

**Keywords:** Recurrent aphthous ulcer, Stress, individuals, Northern Nigeria.

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### 1: INTRODUCTION

Ulcers are defined as lesions devoid of epithelium [2]. They can be short-lived or chronic (longer than two weeks) single in occurrence or recurrent, superficial or deep. Solitary or multiple or widespread. Restricted to certain anatomic sites, e.g., non-keratinized mucosa (e.g., recurrent aphthous stomatitis) vs. keratinized mucosa (e.g., gingivae or palate in the case of recurrent intra-oral herpes). May be an effect of end-organ disease or multi-organ disease processes [2].

Among this, Recurrent aphthous ulcers affects approximately 20% of the general population, but when specific ethnic or socio economic groups are studied, the incidence ranges from 5 to 50% [3]. Recurrent aphthous ulcer is classified according to clinical characteristics as minor ulcers, major ulcers (Sutton disease peradenitis) and herpetiform ulcers [3]. Minor

ulcers which comprise over 80% of Recurrent aphthous cases, are less than 1cm in diameter and heal without scars.

Major ulcers are over 1cm in diameter take longer to heal and often scar herpetiform ulcers are considered a distinct clinical entity, that manifests as recurrent crops of dozens of small ulcers throughout the oral mucosa [1].

According to worldwide epidemiological data, 2%–66% of the international population is affected with aphthous ulcers [6].

**1:1 ETIOLOGY OF RAU:** The etiological concept behind aphthous ulcers is idiopathic and it has been associated with many predisposing factors major being,

**Immunological abnormalities:** The mucosal destruction occurs due to T-cell mediated immunological reaction IgG and IgM binding of the epithelial cells of the spinous layer of oral mucosa is seen in patients suffering from recurrent aphthous ulcers. Mucosal healing defect is associated with inhibition by cytokines [1].

**Genetic predisposition:** increased susceptibility to recurrent aphthous ulcers is seen among the children of aphthous positive parents. Specific HLA-B51 antigen has been identified in aphthous patients making it familial tendency for the occurrence of the disease since it is associated with HLA agents [1].

**Microbial organism:** A pleomorphic transitional L-form of alpha-hemolytic streptococcus and streptococcus sanguis has been implicated as the causative agent of the disease. Others include, varicella zoster virus, adenovirus and cytomegalovirus [4].

**Systemic factors:** Certain percentage of patients suffering from recurrent aphthous ulcers have certain nutritional deficiency such as vitamin B12, Folic acid and Iron. Occasional aphthous ulcers occurring in celiac disease and Crohn's disease maybe result from malabsorption [3].

**Endocrine conditions:** changes in hormonal balance in case of pregnancy, menstruation and menopause in women. Ulcers tends to occur maximum during post ovulation period [7].

**Stress:** Acute psychological problems appear many times, to precipitate the attacks of the disease. More aphthous ulceration is seeing in students during exams period and in working individuals [1].

**Allergic:** Patients may have a history of asthma, hay fever, and food or drug allergy [7].

## 1.2 ORAL FINDINGS OF RAU

The first episodes of RAU most frequently begin during the second decade of life. [1] The lesions are confined to the oral mucosa and begin with prodromal burning anytime from 2 to 48 hours before an ulcer appears. The individual lesions are round, symmetric, and shallow. The buccal and labial mucosa are most commonly involved. In mild RAU, the lesions reach a size of 0.3 to 1.0 cm and begin healing within a week. Healing without scarring is usually complete in 10 to 14 days. Patients with major ulcers develop deep lesions that are larger than 1 cm in diameter and last for weeks to months. In the most severe cases, large portions of the oral mucosa maybe covered with large deep ulcers that can become confluent, which are extremely painful and disabling [3].

## 1:3 CLASSIFICATIONS OF RAU:

Recurrent aphthous ulcers can be classified phenotypically into 3 different types although their classification varies slightly in terms of size and healing time between different authors [6].

**Minor recurrent aphthous ulcer:** This are most frequently observed (80%) small, round, clearly defined commonly below 5 mm in diameter (2–3 mm in average) but painful ulcers that typically heal between 7 and 14 days without scarring [6].

**Major recurrent aphthous ulcer:** It account for about 10% of all recurrent aphthous ulcers. This are larger (diameter exceeds 10 mm) and deep, can last for 6 weeks or longer, and are affecting both mucosa and keratinized tissues, and frequently heal with scarring [3].

**Herpetiform recurrent aphthous ulcer:** May look 'herpetic' in nature but do not have a viral etiology, are mostly present as multiple small clusters of pinpoint lesions that form large irregular ulcers, and similar to minor RAS, heal within 14 days without scarring.

Recurrent aphthous ulcers are further classified into 2 major categories based on severity.

- I. Simple aphthosis: recurrent attacks of any morphology of aphthae with distinct ulcer free periods [6].
- II. Complex aphthosis: constant presence of three or more than three ulcers oral ulcers [6].
- III. Primary idiopathic complex aphthosis, secondary complex aphthosis, HIV, cyclic neutropenia, celiac disease, Hematinic vitamin or mineral deficiencies, specific syndrome, (Behcet's or Magic syndrome) [6].

## 1:4 CLINICAL DIAGNOSIS OF RAU:

- RAU is diagnosed on the grounds of patient history and examination of ulcers. A positive family history, associated medical conditions, medications, occurrence of similar lesions in past, duration and frequency of ulcers may be suggestive of RAU and an inspection of the site, size, number, shape, edge and base of ulcers will help in the clinical diagnosis [4].
- Laboratory diagnosis with regard to CBC, hemoglobin level, C-reactive protein, erythrocyte sedimentation rate, Vitamin B12 level etc.
- In case of a patient diagnosed with any systemic disease then treatment of the underlined cause should be implemented with application of topical therapy for RAU.
- In case of non-systemic condition, patient suffering from RAU should be given topical therapy to subside the pain in case of Minor aphthae and systemic therapy in case of Major aphthae.

## 1:5 MANAGEMENT AND TREATMENT OF RAU:

The primary goals of recurrent aphthous ulcer therapy are, relief of pain, reduction of ulcer duration, and the restoration of normal oral function. Secondary goals include reduction in the frequency and severity of recurrence and maintenance of remission [5].

Treatment must attain control over the ulcers for the longest period with minimal side effects. Therapy approach depends on disease severity (pain), patient's medical history, the frequency of flare-ups and the patient's ability to tolerate the medication. Type of therapy involved, both topical and systemic administration of drugs depending on the severity of the ulcer and whether it is associated with systemic diseases.

### Topical therapy:

Local anesthetics and Analgesics. (2%) Lidocaine is proven to be effective in relieving pain associated with recurrent aphthous ulcer (RAS), but combination of adrenaline (1:8000) further increases the period of pain relief which allow the patient enough time to take the meals [5].

Patient is instructed to apply 2 to 3 drops of it directly onto the ulcer surface and ask to keep mouth open. Anesthesia lozenges can be used, such as benzocaine lozenges.

- **Antiseptic therapies:** Chlorhexidine gluconate: Aqueous mouth rinse may be of some benefit in the management of RAS. Studies show that it reduces the duration of ulcers but cannot prevent the recurrence of ulcers [5]. It is generally used as 0.2% w/w (weight for weight) mouth rinse but the 0.1% w/w mouthwash.
- **Topical Antimicrobials:** Use of antibiotics in the form of mouth rinse such as a mouthwash containing tetracycline (dissolve soluble tetracycline capsule 250 mg in 5–10 ml water and rinse) or chlortetracycline is often highly effective in reducing the pain caused by severe ulceration. Other antibiotics such as aureomycin (containing 3% chlortetracycline), minocycline (0.2% aqueous solution).
- **Topical Anti-inflammatory agents:** Topical paste of 5% Amlexanox having anti-allergic and anti-inflammatory activities has been proved to be clinically safe and efficient in several clinical studies for managing RAS. Topical sucralfate is effective in treating RAS ulcerations when administrated at 5ml, 4 times/day. It acts on the mucous membrane tissue and form a protective barrier on the affected site.

### Topical corticosteroids [5]:

In more severe cases, the use of a high potency topical steroid preparation, such as fluocinonide betamethasone, or clobetasol placed directly on the lesion, shortens healing time and reduces the size of the ulcers. The effectiveness of the topical steroid is partially based upon good instruction and patient compliance regarding proper use.

The steroid gel can be carefully applied directly to the lesion after meals and at bedtime two to three times a day or mixed with an adhesive such as orabase prior to application [3]. Larger lesions can be treated by placing a gauze sponge containing the topical steroid on the ulcer and leaving it in place for 15 to 30 minutes to allow for longer contact of the medication.

## 2: LITERATURE REVIEW

Many authors have undergone different researches since long period of time with regard to Recurrent aphthous ulcers and its causes, peak age of occurrence, the gender group it mostly affected and different modes of treatment applied. However, RAU still remains as epidemiological burden of concern globally, in which Nigeria is not exceptional.

For instance, in a study conducted in Nigeria by author Oyetola E. O *et al.*, in the year 2018 [7], Out of 250 patients seen in the Oral Medicine Clinic during the study period, oral ulcerations were seen in 50 patients comprising 34 (68%) males and 16(32%) females, giving a prevalence of 20%. The commonest site was lower lip (20; 40%) and ulcers were rare on the gingiva (1, 2%). More than half of the ulcers were solitary (26; 52%) and painful at presentation. Recurrent aphthous ulceration accounted for 47 cases (94%)

Similarly, in a study conducted by chinedu Azodu in the year 2016, the author indicated that [8], Of the 306 participants that completed the study, 118 of them reported oral ulceration experience (38.6%). The oral ulceration experience was reported once in 54.2% of the participants, and 35.6% of them did not know the cause. Only 12.7% of the participants sought dentist attention for oral ulceration care. The study also highlighted that [8], the reported prevalence of oral ulceration was higher among younger participants, females, non-cigarette smokers, and alcohol consumers.

In India, a study conducted by George et al also highlighted similar challenges of Recurrent aphthous ulcers imposed on individuals. According to the author [9], Frequency of ulceration was once in 6 months for majority (37) and the rest used to experience it on once in a month to once in 3 months' duration. 49 students (46.2%) were under high stress according to perceived stress scale out of which 39 were with ulcer. Majority of the participants did not take any medication.

### 3: METHODOLOGY

This paper is a survey research and employed the use of questionnaire for data collection through personal interview with individuals of both genders. Kano, Katsina, Maiduguri and Zamfara states constitutes the sample population of the study. Sample size of 75 questionnaires were distributed out of which 71 were retrieved and 4 left un answered.

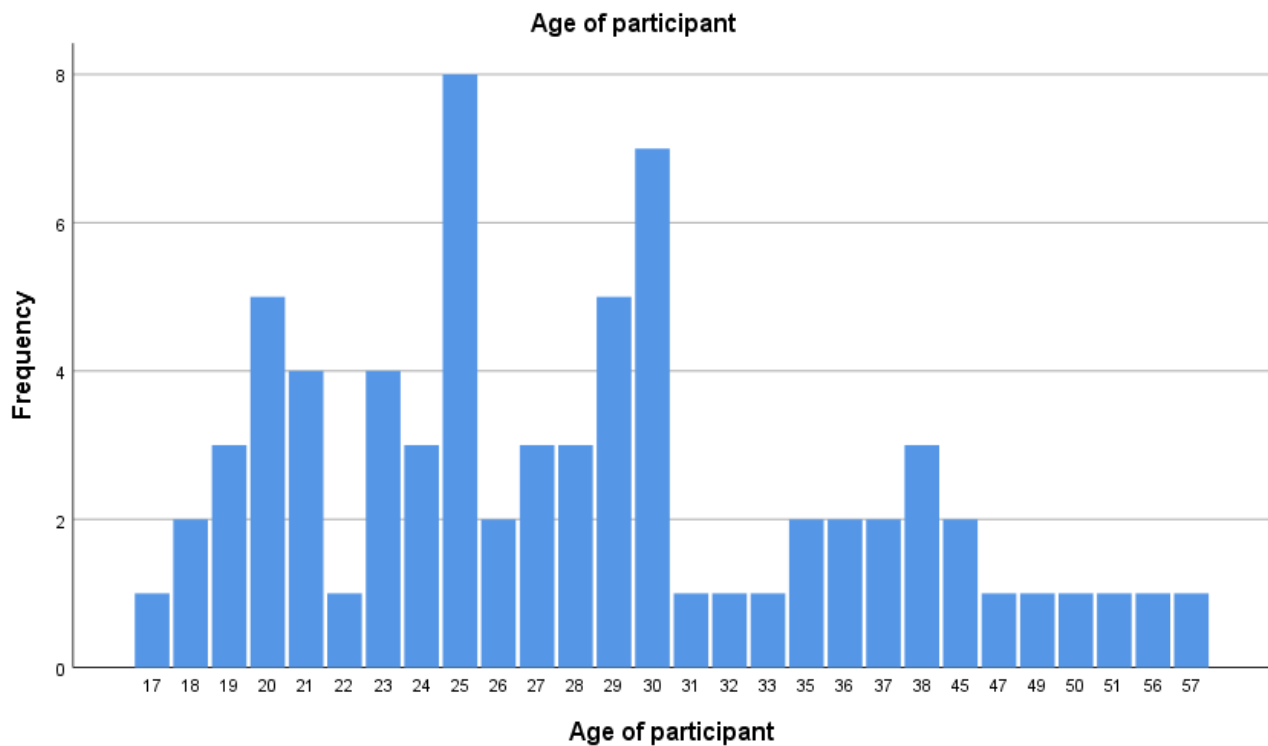
### 4. RESULTS AND DISCUSSION

This section presents the results of the data collected and also discuss the findings. The results were analyzed based on filled and returned questionnaires by

the respondents of the selected samples in each representing state.

The returned questionnaires were categorized based on Age, gender, occupation, history of recurrent apthous ulcers, type, and days took for healing, nature of healing and frequency of re occurrence. The results were analyzed using descriptive statistical studies and correlation analysis between Recurrent apthous ulcers and stress was analyzed under correlation table using statistical package for social sciences SPSS 25.0 VERSION.

Results are displayed in the form of graph and tables.



The above graph shows the different age groups taken as samples in the study. From the number of frequency shown, the highest peak age group found

with history of recurrent apthous ulcers falls in the category of 25 years followed by 20 and 30 years respectively.

**Table 1: History of recurrent apthous ulcer**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	71	88.8	97.3	97.3
	no	2	2.5	2.7	100.0
	Total	73	91.3	100.0	
Missing	System	7	8.8		
Total		80	100.0		

This table represent the total individual response in regard to history of recurrent apthous ulcers. From the percentage above, 88% of the

respondents have history of recurrent apthous ulcers while 2.5% do not.

**Table 2: Site of occurrence in oral cavity**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Floor of mouth	17	21.3	27.4	27.4
	Gingiva	2	2.5	3.2	30.6
	Tongue	19	23.8	30.6	61.3
	Lips	24	30.0	38.7	100.0
	Total	62	77.5	100.0	
Missing	System	18	22.5		
Total		80	100.0		

According to the above result indicated, Lips are the most commonly involved sites of occurrence in the oral cavity with 30.8% followed by Lips 23.8%.

**Table 3: Number of ulcer**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	single	38	47.5	60.3	60.3
	multiple	25	31.3	39.7	100.0
	Total	63	78.8	100.0	
Missing	System	17	21.3		
Total		80	100.0		

Considering the number of ulcer appearing during RAU, single ulcer accounts the highest percentage with 47.5% according to the respondent's observation.

**Table 4: Duration of ulcer**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7-14 days	40	50.0	66.7	66.7
	more than 14 days	20	25.0	33.3	100.0
	Total	60	75.0	100.0	
Missing	System	20	25.0		
Total		80	100.0		

According to the respondent's observation regarding the duration of the ulcer, 50% believe that it lasts between 7-14 days.

**Table 5: Days took for healing**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5-7 days	35	43.8	58.3	58.3
	more than 7 days	25	31.3	41.7	100.0
	Total	60	75.0	100.0	
Missing	System	20	25.0		
Total		80	100.0		

43% of respondent's observation believe that ulcers took 5-7 days for healing.

**Table 6: Nature of healing**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Soothing gel	17	21.3	27.4	27.4
	Antiseptic Mouthwash	10	12.5	16.1	43.5
	Medication	35	43.8	56.5	100.0
	Total	62	77.5	100.0	
Missing	System	18	22.5		
Total		80	100.0		

**Table 7: Frequency of occurrence**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	one time in a month	33	41.3	53.2	53.2
	more than 1 month	29	36.3	46.8	100.0
	Total	62	77.5	100.0	
Missing	System	18	22.5		
Total		80	100.0		

41.3% of the respondents indicate the highest frequency of re occurrence seen, is one time in a month.

**Table 8: Correlation between Recurrent aphthous ulcer and Stress**

		Apthous ulcer	Stress
Recurrent Aphthous ulcer	Pearson Correlation	1	.149
	Sig. (2-tailed)		.220
	Sum of Squares and Cross-products	1.943	.857
	Covariance	.028	.012
	N	70	70
Stress	Pearson Correlation	.149	1
	Sig. (2-tailed)	.220	
	Sum of Squares and Cross-products	.857	17.778
	Covariance	.012	.250
	N	70	72

This table represent the correlation table indicating direct weak relation between both factors which yields the covariance as .012.

weak relation between both factors in which the correlation table yields the covariance as .012.

## DISCUSSION

This study found that, majority of the individuals have history of recurrent aphthous ulcer and accounts the highest percentage compared to those that do not have. This is according to the respondent's answers following data collection.

It is also observed that, the highest peak age of re occurrence is seen at 25 years' age group followed by 20, 29 and 30 years respectively, which is indicating that young age groups are at the highest risk of prevalence of recurrent aphthous ulcers compared to older age group. With regard to the site of occurrence of ulcer, the result indicates that, Lips is the most involved site followed by Tongue and floor of the mouth respectively.

According to the respondents, majority of the ulcer is single in appearance and last within 7-14 days which indicates that, minor category of recurrent aphthous ulcer is the most dominant type affecting majority of the individuals. Based on the respondent's observation, the days took for the ulcer to heal is 5-7 days. With regard to nature of healing, the highest number of respondents consider medication as the most effective choice of treatment for healing.

Frequency of re occurrence of aphthous ulcer is observed to be once in a month and this is according to involved individual's observation. According to the result obtained following Correlation analysis between Recurrent aphthous ulcers and Stress, there is direct

## RECOMMENDATION

In light of the findings following complete data analysis and the result obtained, the following recommendations are highlighted in an effort to bring about more awareness regarding possible factors which may lead to developing recurrent aphthous ulcers and different strategies to be implemented in the mission of prevention.

- Considering the result of re occurrence of ulcer, the highest peak is seen among youth group, (25,20,30 years respectively) It is highly recommended for the Nigerian Dental association to create more awareness regarding risk factors that can fuel the prevalence of the condition with the aim to avoid any factor considered to be associated.
- Since the highest number of re occurrence is observed among the individuals, this paper recommends further research to be conducted in order to find out the specific risk factor/factors associated with the re occurrence in an effort to initiate prevention plan accordingly.
- Nigerian dental association in collaboration with community awareness team should put extra effort in creating more awareness with regard to proper oral hygiene maintenance as well as importance of regular dental checkup.
- Nigerian dental association should emphasize on standard dental consultation among dentists in the nation, especially in taking proper history during consultation in order to rule out

proper factors behind re occurrence of the condition among individuals.

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