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MYCOLOGICAL STUDY OF RECURRENT APHTHOUS STOMATITIS IN SAMARRAH CITY

[1]Gaafar Jameel Ibrahim Azawi, [2]Rafal Khaleel Farhan

***ABSTRACT**--RAS is some of the best communal mucosal conditions of the oral cavity. The etiopathogenesis of RAS is uncertain, but influencing factors include stress, trauma, food allergy, and genetic factors. Stress and microorganisms have a role in the onset and recurrence of RAS.This study aim at clarifying the association between fungus and aphthous ulcer and detection of virulence factors .The current work represented an observational cross-sectional study which was conducted during the period extending from the first of July 2019 to the end of November 2019, with 4-5 regular working hours. The total number of patients in this study was 150 patients attending to the ENT out-patients in Sammarra General Hospital.The total number of patients with recurrent aphthous stomatitis in our study was 150 patients attending to the ENT out – patients in Sammarra General Hospital during the period between 1st of July to end of November 2019. All of these patients have recurrent aphthous stomatitis, 68 (45.33%) were male patients and 82(54.66%) were female patients, while, higher prevalence in age 21-40years 59(39.3%).In our study, the results were that fungal infection as a cause of aphthous stomatitis is infrequent, but in some cases there may be super-added fungal infection in addition to presence aphthous ulceration .*

***Key words**-- RAS, Cryptococcus laurentii, ENT, fungal infection, ulceration.*

I. INTRODUCTION

Recurrent aphthous stomatitis (RAS) are generaly harmless mucosal conditions affecting the mouth. **(1)**

Considering the clinical features:

Minor ulcer is also define as mild aphthous ulcers. It is the most common variant, constituting about 80% of RAS. Ulcers vary from eight to nine mm in size. It is most commonly found in the non-keratinized mucosal surfaces like labial mucosa, buccal mucosa, and floor of the mouth.

Major ulcer is also define as periadenitis mucosa necrotic recurrent or Sutton's disease. It affects between 10 –15% of patients. Ulcers exceeded 1 cm in diameter. **(2).**

Herpeti-form ulceration is characterized by recurrent crops of multi ulcers; may be up to one hundred in number. **(3)**. As with all types of RAS, it is not contagious. Unlike true herpetic ulcers, Herpetiform ulcers are not preceded by vesicles (small, fluid filled blisters)**(4)**.

[1] *B.Sc. Biology, College of Science, University of Tikrit.*

[2] *Professor. PH.D. Medical Microbiology College of Medicine Tikrit University*

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II. CLINICAL CHARACTERISTICS:

Stanley has separated the clinical features of RAS mad about four stages: predictive, pre ulcerative, ulcerative, and soothing [(5)].

III. ETIOPATHOGENESIS OF RAS:

The causes of ulcer so far remainders unidentified. The most important issues contain: hereditary tendency, virus-related and microbial contagions, foods allergy, vitamins plus microelements deficiency, general illness, increased oxidative stress, hormonal imbalance, injuries and anxiety [(6)]

IV. GENETIC PREDISPOSITION

The inherited danger causes which change the single exposure to RAS comprise, several DNA polymorphisms spread in the human genome, specifically persons connected with the changes in the breakdown of interleukins (IL b, IL-2, IL-4, IL-5, IL-6, IL-10, IL-12), interferon (IFN) [(7),(8)] . Additional investigators described the association stuck between the certain HLA allele and the enlarged hazard reasons of RAS and Behc¸et's condition [(9)] .

V. BACTERIAL AND VIRAL INFECTIONS

Oral streptococcus has remained careful as bacterial mediators in the pathogenesis of ulcer. In 1986 established that little stages of annoyed reactivity of spoken Streptococcus [(10)]. The attempts to isolate HSV, CMV, varicella-zoster and EBV DNA from the biologic material collected from aphthae and mono-nuclear peripheral blood cells were successful only in single case of RAS, which also doesn't confirm the direct roles of viruses in the Etiopathogenesis of the condition [(11)] .

VI. Foods Allergy & Microelement Insufficiencies

In certain patients by RAS, the defect in hematins**,** iron, folic acid, vit B12 was revealed [(12)]. nutty then nutrition complexion means can induce the pro-demagogic waterfall in ulcer [(13)] .

VII. SYSTEMIC DISEASES AND HORMONAL IMBALANCE

This association can partially effect starting the food and microelement deficiencies a characteristic complication in this group of the diseases [(15)] .

VIII. STRESS

Pressure consumes remained role as a causal influence in ulcer. This one propose that worry can persuade shock to spoken easy soft muscle by Para functional behaviors .Stress is all pervasive. It was two types. Eustress is positive and helps use to achieve our goals. Distress happen when the adaptive capacity of the individual is

overwhelmed by construction. For each man, stress is defined subjectively and the response to stress is a function of each person's psychological and

IX. SMOKING

particularly excessive smoking, remains an essential prompting dynamics, then the association are unidentified. [17] .

Nicotine is careful near be the protected element as it rouses the release of adrenal steroids through his act happening the hypo-thalamic adrenal alignment and lessens release of (TNF-α) and interleukins 1 and 6 (IL-1 and IL-6)[18]

X. FUNGAL

Also known as oral thrush [19]. Is candidiasis that found in oral cavity. which is, oral candida contagion of *Candida* spp on the mucous membranese of the oral. [20][21].

A different form of average is CHROMagar™ Candida, that container be used to classify dissimilar class of candida [23] .

XI. DIAGNOSIS

Different polls toward diagnosis the found of candida types consist of spoken cloths, spoken colorant or verbal marks[24] . Particular mention that gauzes be full from 3 change oral places [25] .

XII. TREATMENT

No permanent cure is possible for RAS. Topical agent will lessen the pain. A mixture of equal part of elixir of Benadryle and Maalox, held in mouth for Five minute before meal, is soothing. Lido-caine (xaylocaine viscous) 2% solution, keeping 1 tea spoonful in the mouth for several minute, is also helpful in allying pain.

Debaryomyces hanseniis (Candida famata)

Candida famata a hemi-ascomycetous yeast predominant occur in natural substrates and in various types of cheese[26]. It has been described in human infections [27] . However, its incidence during candidemia is low dependent on data surveillance implemented by the Centers for Disease Control and Prevention [28]

XIII. CULTURE CHARACTERISTICS

Candida famata grows highly on routine mycology media to produce cream colored colonies at 37°C. It produces oval budding yeast on cornmeal Tween-80 agar that are about 3.5 µm to 5 µm in diameter. Mycelia are usually absent, but rudimentary pseudo hyphae may occasionally form[29].

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XIV. PATHOGENICITY

Many virulence factors collectively attribute to the fungal pathogenicity. Various virulence factors such as adhesion to host tissues, biofilm formation and release of extracellular hydrolases contribute to the pathogenicity of Candida spp. Most of published literatures on virulence factors of Candida spp. are absorbed on C. albicans and hence relatively fewer is recognized around NAC spp .

XV. CRYPTOCOCCUS LAURENTII

Cryptococcus species additional than *C. neoforman* remain commonly careful non-pathogenic to persons. Nearby stay simply 15 incident intelligences of pathogenesis for persons produced by C. laurentii infection. [(30)]. Cryptococcus is an communicable illness of universal incidence produced by an sum up, [(31)]. [(32,33)].

XVI. MATERIALS & METHODS

This study was conducted at Samara General Hospital . The number of patients were 150 with recurrent aphthous stomatitis, and they recruited from 9/6/2019 to 20/10/2019, all with recurrent aphthous stomatitis . The patients included 82 females and 68 males. Patients aged group between 1 to 70 years. **Samples Group**

The sections were composed from the patients by smearing from aphthous stomatitis . Smear sample was collected for culture and diagnosis of fungal, and prepare for polymerase chain reaction for detection of virulence factor . Media were ready and pasteurized according to producer's teaching . Swab sample was taken with calibrated sterile inoculating swab and fractioned on the surface of Sabouraud Dextrose Agar, and then if growth appear on SDA after 48hur to 72hur of incubation at 37C the growth transport to culture on differential media plates – chrome agar candida to recognize species of candida from other species of fungal .

Microbial identification using the biomerieux vitek 2 system

The YST documents pass is created on recognized chemical systems and anew advanced substrates . There are 46 chemical tests quantifying carbon basis use, enzymatic activities and resistance. Last documentation effects are obtainable in around 18 hours.[(34)(35)]

XVII. RESULTS

The total number of illness by means of ulcer in our study was 150 patients attending to the ENT out – patients in Sammarra General Hospital during the period between 1st of July to end of November 2019. All of these patients have recurrent aphthous stomatitis, 68 (45.33%) were male patients and 82(54.66%) were female patients . These patients with RAS were studded for fungal infection as a possible causes of ulceration only 5 (3.3%) patients out of 150 cases were found to have fungal infection in association with aphthous ulceration, from these 5 patients two patients with C. albicans, two with C. famata, one with Cryptococcus laurentii. As showing in **Table.1.**

Table 1: Distribution according to the Gender

Fungal	+ve	-ve	Total

Gender			
Male	**3 (2.0 %)**	**65**	**68 (45.4%)**
Female	**2 (1.3%)**	**80**	**82 (54.6%)**
Total	**5 (3.3%)**	**145**	**150 (100%)**
Statistical			**Ns** **Chi-Square = 0.449 P-Value = 0.503**

According to age of patients, the ages of patients was in the middle of 1 – 80 years by nasty age of 40 years. The prevalence of the aphthous ulceration was highest 59(39.3%) in age 21-40 years, followed by the age group 1 – 20 years 48(35.3%), the reminder patients are distribution between other age group. As showing in **Table.2.**

Table 2: Distribution according to age**.**

Fungal / Age/ Years	+ve	-ve	Total
1 – 20	5 (3.3%)	48	53 (35.33%)
21 – 40	0 (0.00%)	59	59 (39.33%)
41 – 60	0 (0.00%)	30	30 (20.00%)
61 – 80	0 (0.00)	8	8 (5.33%)
Total	5(3.3%)	145	150 (100%)
Statistical			***** **Chi-Square = 9.466 P-Value = 0.031**

According to socio-economic status

The distribution of RAS was as following:

*Urban area 45(30%) patients which 1(0.666%) of them are positive (+ve) in culture for fungal infection. *Rural area 30(20%) patients which 2(1.333%) of them are positive (+ve) in culture for fungal infection. *Displaced people 75(50%) patients which 2(1.333%) of them are positive (+ve) in culture for fungal infection .As showing in **Table3.**

Table 3: Distribution according to socio-economic status.

Fungal / Socio-economic	+ve	-ve	Total
Urban	1 (0.666%)	44	45 (30.0%)
Rural area	2 (1.333%)	28	30 (20.0%)

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Displaced	2 (1.333%)	73	75 (50.0%)
Total	5 (3.3%)	145	150 (100)
Statistical			**Ns** **Chi-Square = 1.310 P-Value = 0.519**

According to the occupation of patients, the majority of patients 97(64.66%) were free occupation, 12(8%) were employees and 41(27.33%) were jobless patients. All the patients with positive culture for fungal infection belong to the jobless group of patients. As showing in **Table.4.**

Table 4: Distribution according to occupation .

Fungal / **occupation**	**+ve**	**-ve**	**Total**
Free occupation	0 (0.00%)	97	97 (64.6%)
Employees	0 (0.00%)	12	12 (8%)
jobless	5 (3.3%)	36	41 (27.4)
Total	5 (3.3%)	145	150 (100%)
Statistical			****** **Chi-Square = 13.751 P-Value = 0.011**

According to the habit of smoking, the distribution of case among patients with cigarette smoking was 35(23.33%), while among non- smoking was 115(76.6%). All the patients with positive culture for fungal infection are found in non-smoking group . As showing in **Table.5.**

Table 5: Distribution according to habit of smoking.

Fungal / **Smoking**	**+ve**	**-ve**	**Total**
Smoking	0 (0.00%)	35	35 (23.4%)
Non-Smoking	5 (3.3%)	110	115 (76.6%)
Total	5 (3.3%)	145	150 (100%)
Statistical			**Ns** **Chi-Square = 1.574 P-Value = 0.210**

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According to periodic consultation of dentist, 125(83.44%) of patients have non-periodic review and only 25(16.66%) have regular periodic to dentist. All the patients with positive culture for fungal infection have non-periodic review to dentist .As showing in **Table.6.**

Table 6: Distribution according to periodic consultation of dentist**.**

Fungal / Dentist review	+ve	-ve	Total
Periodic	0 (0.00%)	25	25 (16.6%)
Non-periodic	5 (3.3%)	120	125 (83.4%)
Total	5 (3.3%)	145	150 (100%)
Statistical			**Ns** **Chi-Square = 1.574 P-Value = 0.210**

XVIII. DISCUSSION

This study was conducted on patients visit the ENT out – patients in Sammarra General Hospital, taking a patient by ulcer. The number of case in this study was 150 patients, all of them are with RAS. These patients are subjected to swab taking from the ulcer of the mouth. The taken swab is examined for presence of fungal infection at the ulcer site. From the total number (150 cases) of patients with RAS, only 5 case (3.3%) showing growth of fungal after swab taken and culture for fungal growth. Two case was showing growth of Candida famata, two case was showing of C. albicans, and one case was showing Cryptococcus laurentii.

Gender factor:

In our study the higher prevalence of RAS was in group patients female 82(54.6 %), and in the case of male 68(45.4%), this fact of prevalence of RAS according to gender is going with other studies as, Present reading contained of 114 women (51.6%) and 107 men(48.4%) In our study females had slight predominance compared to males. This finding is in accordance with existing literature[(36)]. In relative to the woman bias to RAU, certain writers need optional that this suggestion is related to hormonal rates[(37)] .

Age factor:-

Individuals 21-40 years has higher rate of RAS 59(39.3%) than those who are above 40 years of age. Followed by the individual 1-20 years 53(35.3%). Maximum reports in the works show that elder persons have a greater prevalence of RAS as 17-39 years [(38),(39)] .

Socio-economic status factor:-

The frequency of RAS in our study was higher at patients who are displaced 75(50%), followed by urban patients 45(30%) and finally at rural area patients 30(20%). The cause of high prevalence of RAS among displaced patients is most probably due to high stress condition that they suffering. Evans and English

suggest that the exposure to stressors (noise, crowding, and lower quality housing) are at high risk of developing RAS[40].

Occupation factor:-

The highest prevalence of RAS was among those patients with free-occupation 97(64.6%), followed by jobless patients 41(27.3%). All the case of positive swab culture for fungal infection is found in group of patients who are jobless. The higher rate of prevalence of RAS is associated with any factor that increased the stressors. Patients with higher socio-economic levels could be associated with high stress. So the prevalence of RAS will be higher in patients with high socio-economic state if the stress is higher. This fact is mentioned in studies conducted by [41],[42]

.

Cigarette smoking factor:-

In our study, the highest incidence of RAS is formed in patients which non-smoking individuals 115(76.6%). The incidence of RAS in smokers was 35(23.4%) patients. All patients with positive culture for fungal infection is found in the group of non-smoking patients. Our findings are agreements with previous reports of [43],[44].[45]. [46] .

Dental health& hygiene factor:-

In our study, the majority of patients 125(83.34%) with RAS have non-periodic visits to the dentist. All patients with positive culture for fungal infection is found in this group of patients. This results in poor dental hygiene and increased risk recurrent aphthous stomatitis and fungal infection. These facts are in agree with a study contacted by [47], which show that poor teeth and gum hygiene is associated with increased prevalence of RAS.

XIX. CONCLUSIONS

1. Aphthous ulcer is communal problem in the oral hollow. There are many possible causes for the development of aphthous ulceration, and the aphthous ulcer may be idiopathic in its nature of development.

2. High socio-economic status and patients with competent immune system are at higher risk of developing aphthous ulceration.

3. In our study, the results were that fungal infection as a cause of aphthous stomatitis is impossible, but in some cases there may be super-added fungal infection in addition to presence aphthous ulceration .

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