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Psychological Morbidity In Recurrent Aphthous Stomatitis And Oral Lichen Planus

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Abstract
Background: *Stress is a biological response to a perceived threat. Stress, anxiety, and depression have frequently been mentioned as possible factors related to the development of Recurrent Aphthous Stomatitis (RAS) and Oral Lichen Planus (OLP).*
Objectives: *To determine the role of stress in the incidence of RAS and OLP. Determining the gender predominance of stress level in patients diagnosed with RAS and OLP and controls.*
Materials and Methods: *Perceived stress scale (PSS) questionnaire provided to 30 RAS, 30 OLP patients and 30 Controls.*
Results: *There is a positive correlation between stress and existence of RAS and OLP. The mean PSS score in RAS patients is high in males compared to females. No significant difference in stress level between males and females among OLP patients and controls.*
Conclusion: *Along with the medical management, psychological approach should also be included for wholesome recovery.*
Key Words: *Oral Lichen Planus, Recurrent Aphthous Stomatitis, Stress*

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I. Introduction:

Psychological stress occurs when someone senses that environmental demands exceed his/her adaptive capability[1]. Cortisol, also known as the stress hormone, is secreted by the adrenal cortex and is used to assess stress and anxiety in human beings. Persistent anxiety problems cause changes in the Hypothalamus pituitary-adrenal axis thereby increasing cortisol levels[2]. The cortisol hormone levels are used as an indicator for stress evaluation. It also influences metabolism, immune regulation, vascular responsiveness, cognition, behavior, and pathological conditions, such as inflammatory autoimmune disorders[2]. Stress, anxiety, and depression have frequently been mentioned as possible factors related to the development of OLP[1] and RAS. The exact nature of association between these chronic lesions and psychological morbidity is not clear.

An understanding of Psychological and immunological factors can help the clinicians in the management of these lesions with great success rate.

There are few studies correlating these psychological factors with disease processes evaluated using different questionnaires. The present study is done to evaluate the psychologic morbidity in OLP and RAS patients comparing with controls using the PSS questionnaire and hence to motivate patients to overcome stress in order to prevent the recurrence or exacerbation of the disease.

Study design

The study was approved by the Institutional Review Board (IRB). A total of 90 participants among which 30 RAS patients (group 1), 30 OLP patients (group 2) and 30 controls (group 3) in each of which 15 were males and 15 were females, selected from the out-patient department of Oral Medicine and Radiology, Madha Dental college and hospital.

Patients who are Nonsmokers and with minimum 2 years of minor form of RAS history, with flat ulcers surrounded by inflammed margins in the non-keratinized mucosa, without tissue tags and gingivitis were

included in the group 2 of the study. And patients with systemic illness such as Behcet's syndrome, Celiac or Crohn's disease, HIV, diabetes and patients with organ transplantation were excluded.

Patients clinically and histopathologically diagnosed with OLP**,** and who are not under medication for their condition are included in the Group 2 of study. Patients who are diagnosed with Mental illness like Schizophrenia, Bipolar disorder etc. and who were receiving psychoactive drugs or other drug therapy and Patients with HIV were excluded.

All participants were informed of the nature of the study, and after obtaining written informed consent from them, they were provided with Perceived Stress Scale Questionnaire, [PSS-10; adaptation from Pratibha PK[3].] which consisted of 10 questions to which the participants need to fill up the answers and return it back to the investigator.

The Perceived Stress Scale (PSS) is a classic stress assessment instrument. The tool, while originally developed in 1983, remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way; rather indicate the alternative that seems like a reasonable estimate.

All the subjects were provided with Perceived Stress Scale Questionnaire which consists of 10 questions and For each question choose from the following alternatives: 0 – never; 1 - almost never; 2 – sometimes; 3 - fairly often; 4 - very often

The questionnaire below are:

l. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and stressed?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that happened that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

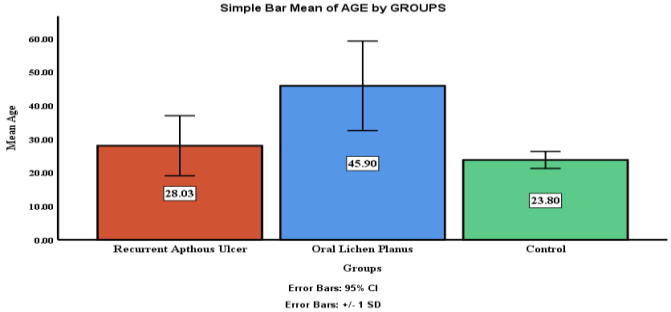
By inversing the answers of questions 4, 5, 7 and 8 and then add up the scores for each item to get a total. Score for an individual on the PSS can range from 0 to 40 with higher perceived scores indicating higher perceived stress. Scores ranging from 0-13 would be considered as low stress**;** 14-26 as moderate stress and 27-40 as high perceived stress. These scores will be correlated and statistically analysed.

Statistical analysis

Data were entered in Microsoft Excel spreadsheet and analyzed using SPSS software (IBM SPSS Statistics, Version 20.0, Armonk, NY: IBM Corp.) Descriptive statistics were used for data summarization and presentation.A p value of 0.05 were considered to be statistically significant. One way ANOVA used for comparison of mean PSS scores between groups. Chi-square test was used for association of categories of PSS scores between Groups and between gender. Independent t test was used for comparison of mean PSS scores between male and females among different groups

II. Results

Figure 1 – Shows distribution of study subjects based on age



The mean age of participants of RAS group is 28 years, OLP group is 45 years and the control group is 23. (Figure 1)

Table 1

PSS SCORE	Mean	Std. Deviation	95% Confidence Interval for Mean		One way ANOVA	P value
			Lower Bound	Upper Bound		
RAS	21.63	6.53	19.19	24.07	18.03	0.001**
OLP	27.77	4.81	25.97	29.56		
Control	19.03	5.87	16.84	21.23		

Comparison of Mean PSS scores between Groups is given in table 1.

The mean PSS score of OLP patients is high (27.77) followed by RAS Patients (21.63) and control (19.03). These values are statistically significant. (Table 1).

Table 2

Categories of PSS Scores	Groups			Chisquare test value	P value
	RAS n(%)	OLP n(%)	Control n(%)		
Low stress	3(33.3%)	1(11.1%)	5(55.6%)	25.50	0.001*
Moderate stress	19(38.8%)	8(16.3%)	22(44.9%)		
High stress	8(25.0%)	21(65.6%)	3(9.4%)		

Association of categories of PSS scores between Groups is depicted in table 2.

More OLP patients (65.6%) obtained high PSS scores, followed by RAS (25.0%). More control participants (44.9%) obtained moderate PSS scores, followed by RAS patients (38.8%) More number of control participants (55.65) obtained low PSS score. These results are statistically significant (Table 2).

Table 3

Mean PSS scores	Gender (Mean± SD)		Independent t test value	P value
	Male	Female		
RAS	24.80±5.74	18.47±5.81	3.00	0.006*
OLP	28.07±2.55	27.47±6.42	0.33	0.73
Control	19.40±6.60	18.67±5.25	0.34	0.74

Comparison of mean PSS scores between males and females among different groups is depicted in table 3.

The mean PSS score in RAS patients is high in males (24.8) compared to females (18.47). It is statistically significant. The mean PSS score of OLP male participants is (28.7) is more or less equal to that of females (27.47). Similarly, male controls obtained (19.40) mean score while females obtained (18.67). The comparison of mean PSS score among males and females of OLP and Control groups are not statistically significant (Table 3).

Table 4

Groups	Categories of PSS Scores	Gender		Chisquare test value	P value
		Male n(%)	Female n(%)		
RAS	Low stress	0 (0%)	3(20%)	7.97	0.01*
	Moderate stress	8(53.3%)	11(73.3%)		
	High stress	7(46.7%)	1(6.7%)		
OLP	Low stress	0 (0%)	1(6.7%)	1.04	0.59
	Moderate stress	4(26.7%)	4(26.7%)		
	High stress	11(73.3%)	10(66.7%)		
Control	Low stress	3(20.0%)	2(13.3%)	0.71	0.69
	Moderate stress	10(66.7%)	12(80%)		
	High stress	2(13.3%)	1(6.7%)		

Association of categories of PSS scores between males and females among different groups is depicted in table 4.

More number of male RAS patients (46.7%) have obtained high PSS score compared to females. It is statistically significant. There is no significant difference in PSS scores between males and females among OLP and control group (Table 4).

III. Discussion

RAS is a disorder characterized by recurring ulcers confined to the oral mucosa in patients with no other signs of disease. They are usually painful, shallow round ulcers with an erythematous halo covered by a yellowish-gray fibromembranous layer (Figure 2 A). RAS is classified according to clinical characteristics: minor ulcers, major ulcers and herpetiform ulcers[6]. The exact etiology of aphthous ulcer is uncertain, but precipitated factors include stress, trauma, food sensitivity, and genetic predisposition. Previous studies have suggested that stress and anxiety have a role in the onset and recurrence of aphthous ulcers.

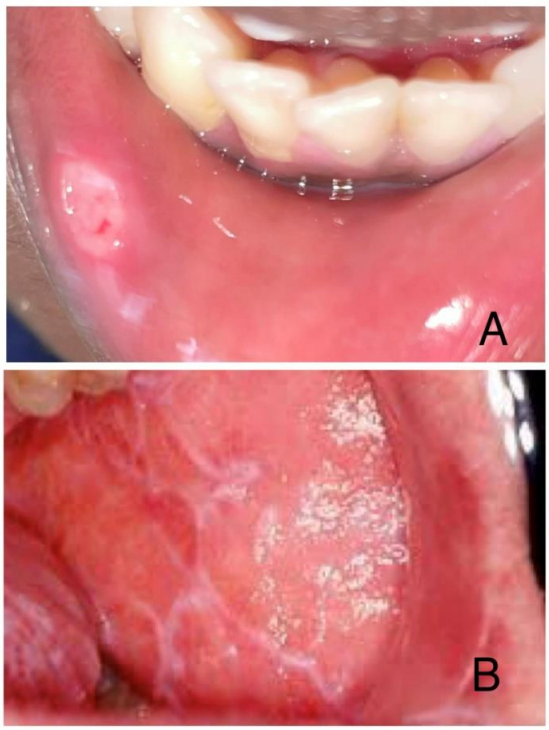


Figure 2. (A) Shows minor aphthous ulcer in lower labial mucosa
(B) Shows Reticular lichen planus in left buccal mucos

OLP is a chronic inflammatory cell-mediated immune disease. Skin and mucous membranes are most commonly involved. Typically, OLP is bilateral (symmetric) and can appear both white and red, depending on disease activity. It can be Reticular (Figure 2 B), atrophic, erosive, Plaque-like or Bullous forms[4]. Has a multifactorial etiology, where the psychogenic factors seem to play an important role. Exacerbation of OLP has been linked to periods of psychological stress and anxiety, These factors can either trigger onset of the disease or cause existing disease to worsen[5]

Equal number of male and female patients and controls were taken into the study. Mean age group of participants of RAS, OLP and control groups are 28, 45 and 23 respectively.

The mean PSS score of OLP patients is high (27.77) followed by RAS Patients (21.63) indicating that, stress level in OLP patients is comparatively higher than that in RAS patients. There is no significant difference in mean stress score among RAS patients and control group.

The control group in this study have also perceived moderate stress because, this study included the dental students in the control group who are attributed to higher stress due to the nature of their academic curriculum compared to other populations, which is similar to study by Mamta Sharma et al among dental students in an educational institution[7].

There is a positive correlation between stress and existence of RAS and OLP. Correspondingly Rao et al. stated that presence of stress adds to the chances of having RAS by 3.1 times [8]. Study by K Li et al. in China, there was a significant association of OLP with anxiety, depression and stress compared with healthy controls[9].

The mean PSS score in RAS patients is high in males (24.8) compared to females (18.47). On contradictory to this, the Mean stress scores of females were more compared to males, reported by Singh et al[10]. Study by Camila de Barros Gallo, showed no significant difference in stress levels among males and females with RAS[11].

There is no significant difference in stress level between males and females among OLP patients

Changes in the cell mediated immune response induces degeneration of epithelial basal layer which results in disease process (Figure 3).

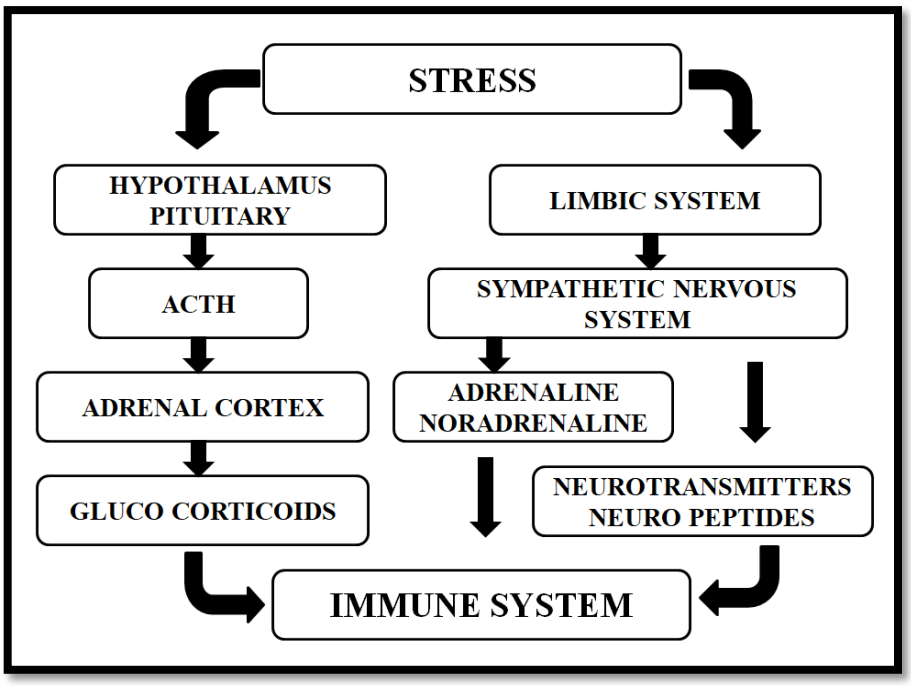


Figure 3. Shows flowchart on how stress influence the immune system

IV. Conclusion

The Perceived Stress level is positively correlated with RAS and OLP patients compared with controls. The present study involved a small sample size, and the results must be confirmed by larger, longitudinal, population studies.

Further research can be directed at assessing psycho-immune interactions as these may represent various ways in which the psychological status of an individual may affect immune status homeostasis of OLP and RAS

Targeted efforts should be implied to tackle stress level and improve physical and psychological well-being. Along with the medical management, psychological approach should also be included for wholesome recovery.

V. Limitations

Small number of populations is taken into the study. Results may vary while including larger populations.

This study reveals increased stress level in male patients in RAS group and no significant difference in stress level between genders in OLP group. These results are contradictory to previous studies.

Future Prospects

Further studies could be done including a larger population. And management of the diseases could be modified by adding psychological approach along with clinical management for wholesome recovery.

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