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International Journal of Current Research
Vol. 9, Issue, 02, pp.46278-46281, February, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

ROLE OF STRESS IN ORAL LICHEN PLANUS- A CROSS SECTIONAL STUDY

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ARTICLE INFO

Article History:
Received 03rd November, 2016
Received in revised form
19th December, 2016
Accepted 10th January, 2017
Published online 28th February, 2017

Key words:
Oral lichen planus,
Stress, Serum cortisol.

ABSTRACT

Aim is to evaluate and correlate the levels of psychological stress, serum cortisol and hemoglobin among different types of oral lichen planus patients in both the sex.
Material and Methods: Study group comprises of 60 oral lichen planus (OLP) subjectsand 30 healthy subjects in control group. HAD scale is used to evaluate stress anxiety and depression. 5ml disposable syringe was used to collect blood for measuring cortisol and hemoglobin and ECI chemiluminescence method was used for serum cortisol level evaluation.
Results and Conclusion: 95% of study group were having stress with P value of 0.0001 which is highly significant. Serum cortisol level also showed 381nmol in OLP subjects compared to 211nmol in Control group. OLP were significantly higher in the younger age group (18-39). Oral diseases were significantly higher in anxiety patients than indepression and control group patients. Most common is Reticular type (70%) of OLP followed by mixed, papular and erosive types. Most common site is buccal mucosa followed by gingiva and hard palate. Hemoglobin level hasn't showed in significant change. Author also emphasis counseling to be part of management of OLP and relaxation technique included in day to day routine to combat the stress.

Citation: Dr. Suman Sen, Dr. Pradyumna Kumar Sahoo, Dr. Vihang Naphade and Dr. Smita Priyadarshani. 2017. "Role of stress in oral lichen planus- a cross sectional study", *International Journal of Current Research*, 09, (02), 46278-46281.

INTRODUCTION

Psychosomatic factor plays an important role in the causation of different forms of mucosal changes among which one of them is oral lichen planus (OLP). Oral diseases may be a direct expression of emotions or conflicts. The mouth is directly or symbolically related to major human instincts and is charged with a high psychological potential, most prevalent being lichen planus. Review of literature reveals psychological stress arise as a direct expression of emotions, or indirect result of psychological alterationsplays an important role in the occurrence of oral lichen planus (Valter *et al*., 2013; Soto-Araya *et al*., 2004). Cortisol, also called as "stress hormone", has been used as an indicator in stress evaluation. Measurement of free cortisol or biologically active cortisol in human serum provides minimally invasiveand relativelyeasy technique. Virtually all lichen planus including oral lichen planus result from the interaction of host, lifestyle and environmental factors.

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Although the etiology has not been fully elucidated, an immunologically induced degeneration of the basal cell layer of the oral mucosa has been suggested (Black, 1992). Stress is a state of physiological or psychological strain caused by adverse stimuli, physical, mental, emotional, internal or external, that tend to disturb the functioning of an individual. Socioeconomic factor, type of occupation, daily schedule, competitive work load, emotional disturbances, etc. have led to increased stress levels in the modern lifestyle. It was observed that certain intense and prolonged emotional stress such as anxiety, shock, sadness, disappointment, failure, humiliation would often initiate the process of lichen planus. Stress was also identified as most important cause of exacerbation of OLP (Carrozzo, 2009). A study conducted on evaluation of salivary cortisol and psychological factors in patients with oral lichen planus by Bina Shah *et al* (2009) reported that depression, anxiety, stress and salivary cortisol levels had independent influence on occurrence of OLP. OLP is clinically divided into six clinical types given by Andreasen (1968) reticular, papular, plaque-like, erosive, atrophic, and bullous. The reticular, papular, and plaque-like forms are usually asymptomatic and appear clinically as white keratotic lesions. The erosive,

atrophic, and bullous forms are often associated with a burning sensation and pain. So a study was conducted with aaim to compare serum cortisol level with the occurrence of lichen planus, to evaluate the impact of stress, anxiety and depression on prevalence of lichen planus and to correlate hematological finding- by assessing hemoglobin level.

MATERIALS AND METHODS

A total of 90 patients were selected from out patient department of Jaipur dental college, Jaipur, which comprised of60 clinically diagnosed OLP cases and 30 subject aged matched between 20-50 yrs and 15 males and 15 femaleswere taken as control group.The subjects and control groups participated voluntarily, signing a written consent form. Demographic data of the patients with complete case history was recorded. A questionnaire was used to evaluate stress, anxiety and depression in such patients. Morning serum cortisol level was evaluated in all patients after taking written consent from them. Patients with OLP exhibiting the characteristic clinical features of the disease based on set clinical criteria were included in this study. Patients having any other local or systemic diseases, patients who had habits like smoking, tobacco chewing which could cause mucosal lesions and those who were under any medication were excluded from the studyPatients withsystemic involvement of LP were also excluded. Armamentariums used were mouth mirror, probe, check retractor, metallic scale, divider, tweezers, cotton and plastic vial. The clinicalexamination of the oral cavity was done following theWHO guidelines, under artificial illumination on a dentalchair, using a mouth mirror to check for OLP. HAD scale is used to evaluate stress anxiety and depression.5ml disposable syringe was used to collect blood and ECI chemiluminescence method was used for cortisol level evaluation. The instrument used for this study was chemilumiseneVitros – ECI. All the subjects serum cortisol level were measured during 9 am -10am. The values were noted andstatistically analyzed by using Chi-Square Tests for P value (Pearson's correlation).

OBSERVATIONS AND RESULTS

Table 1. Comparison of level of Stress by HAD scale among OLP and control groups by using chi square

Group	Anxiety and Depression according to HAD Scale score above (>7)	P value
Study Group with OLP (n=60)	95% (57)	0.0001 (H.S)
Control Group (n=30)	30% (9)	

HS – Highly Significant, p<0.05

Table 2. Age wise distribution of different Clinical types of OLP

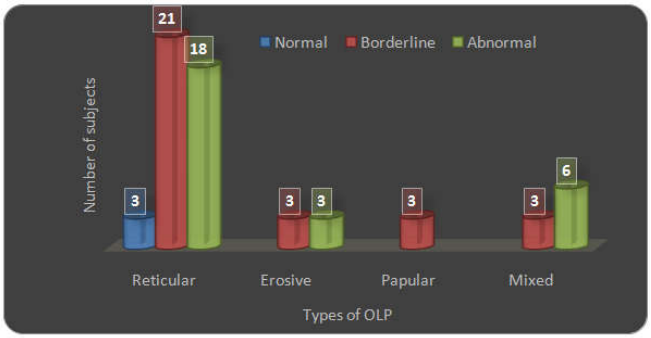
Age		Type of lichen planus			
Age Group (years)	Total	Reticular	Erosive	Papular	Mixed
20 – 29	21	21	-	-	-
30-39	21	9	3	3	6
40- 49	6	6	-	-	-
50-59	6	-	3	-	3
60- 69	6	6	-	-	-

DISCUSSION

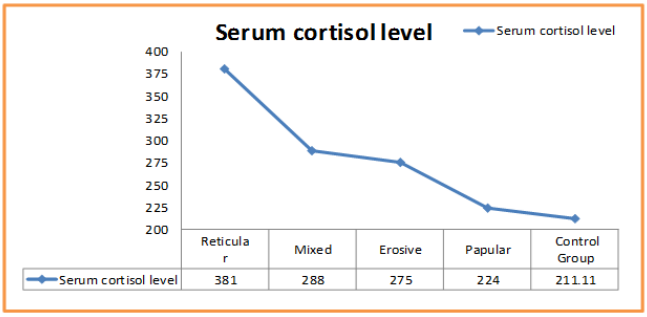
The impact of oral disorders on quality of life has been increasingly recognized as an important outcome measure for clinical trials, especially since oral disorders frequently have detrimental effects on speech, nutrition, physical appearance, self-esteem and social interaction. OLP frequently affects patient's quality of life because of long lasting and recurrent episodes of burning pain. The analysis of our result showed an association between psychogenic alterations due to stress, anxiety and depression which leads to oral mucosal changes in conditions like OLP. The comparison of results of the study and control groups showed that 57 subjects (95%) of study group were having stress, anxiety and depression as compared to 3 (30%) of control group with a P value of 0.0001 which is highly significant (Table 1). Serum cortisol level also had significant results with P value of 0.001.

Table 3. Hemoglobin level in males and females of OLP group and control group

Hemoglobin level of OLP study group (n=60)		
	Males	Females
Normal	18 (30%)	18 (30%)
Below normal	15 (25%)	9 (15%)
Control group (n=30)		
Normal	(30%)	(40%)
Below normal	(20%)	(10%)



Graph 1. Distribution of different types OLP depending on severity of anxiety and depression (HAD scale)



Graph 2. Correlation between serum cortisol in different types of OLP study group with control group

Table 4. Lichen planus noted in different sites in oral mucosa

Site of oral lichen planus	Numbers of patients
Buccal mucosa	48
Attached gingiva	6
Palatal mucosa	6

Results showed that the subject group of OLP, presented with high stress, anxiety and depression showing significant differences with the controls. This has been established by previous studiesthat reported high prevalence of OLP in patients, can be due to increased psychological stress and psychiatric illness can modify immunological functions (Shah *et al*., 2009; Ismail *et al*., 2007; Lundqvist *et al*., 2006;

Lavanya *et al*., 2011; Eisen, 2002). Prevalence of OLP in psychiatric patients may due to interaction of biological and psychological systems (Richter *et al*., 2003; Suresh *et al*., 2015). A Indian study by Saraswathi T *et al*, reported a prevalence of 0.15% of OLP (Lundqvist *et al*., 2006). Another latest survey by Mathew AL *et al*. reported a prevalence of 1.2% in Indian population (Mathew *et al*., 2008; Valter *et al*., 2013). The prevalence rate of OLP in our study was found to be higher than reported by, previous studies. Out of 60 clinically proven cases of oral lichen planus patients, 48 patients had presented with lesions involving buccal mucosa, 6 with predominant involvement of attached gingiva and 6 with palatal involvement. (Table 4) This result is consistent with previous studies (Lavanya, 2011). When all the cases of OLP were analyzed, maximum number of cases was of reticular type followed by mixed, papular and erosive types. There were 42cases of reticular type (70%), 6 case of combined pattern of erosive, reticular and pigmented type (15%), 6 cases of erosive type (10%) and 3 case of papular type (5%) (Graph 1). In previous studies most common type of OLP was reticular form followed by erosive form, combined, linear pattern, annular pattern (Shah, 2009). In our study most common was reticular type of OLP and least was papular type of OLP, which may be due to different levels of stress. In this study subjects with any habit, diseases or history of any medication were excluded. So it was concluded that stress may be one of the major contributing factor in OLP especially reticular pattern.

In this study it was interesting to note that reticular type was predominantly seen in males (45%) while only 25% was seen in females**.** In females papular, erosive and combined pattern of OLP were present. When subjects were divided according to their age group, it was interesting to note that maximum number, 70% subjects (42 cases) were in 2nd and 3rd decade of life and 30% (18 cases) were in 40-65 year age group (Table 2). According to our study OLP was most commonly seen in 2nd to 3rd decade of life which differ from previous literature by Sheikh Manzoor Ahmad *et al* (Ahmad, 2005) and Atessa Pakfetrat (Pakfetrat, 2009), observed OLP being more common in 4th to 5th decade of life. When the detailed case history was evaluated of this age group, it was found that stress was strongly related to examination and peer competition with lifestyle related more expectations lead to non-fulfillment of desires leading to depression.

Among 60 subjects of OLP, reticular pattern was seen in all age groups with slightly more prevalence in 20-29 year age group whereas erosive type was common in older age group. Mixed and papular types were seen in 30-39 year age group. On evaluating 60 subjects of OLP by using HAD scale separately for anxiety and depression, 51 (85%) subjects were found to have anxiety and 45 (75%) were suffering from depression. Among 33 (55%) females were having anxiety as compared to 24 (40%) males. This study showed that there is more predominance of anxiety and depression in females. When this data was correlated with detailed case history of OLP patients it showed that among females stress was more due to family disputes. Reticular type of lichen planus is most commonly related to stress, anxiety and depression. Stress, anxiety and depression when evaluated by HAD scale showed 57 subjects (95%) having stress. Most of the values of serum cortisol were in the upper limit of normal range in study group compared to control group. In oral lichen planus subjects the mean serum cortisol level in males was 365.11 nmol/L and in females 335.54 nmol/L (Graph 2). Hence there is positive correlation between anxiety, depression with salivary cortisol level in OLP patients. This result is in agreement with previous studies (Shah *et al*., 2009). Values of serum cortisol had a variation with the type of lichen planus, with reticular type having the maximum value followed by mixed, erosive, and papular type. These results were not in line with previous studieswhich stated that erosive type of OLP was associated with increased level of stress and cortisol level (Ismail *et al*., 2007; Lundqvist *et al*., 2006). Result showed that in OLP study group 50% of (30 cases) patients have borderline level of stress while 45% (27 cases) subjects having abnormal level of stress. Result showed a total level of stress, anxiety and depression in OLP group is 95% which is much higher than the previous studies. (Eisen, 2002; Srinivas *et al*., 2011) It may be due to changes in modern lifestyle in higher socioeconomic subjects. Most of the subjects were from lower socio economic status. They were going through financial crisis and family problems which was also a major cause of stress among them. So, it can be conclusively said that there is a direct correlation exist between stress and OLP. Stress-management interventions like relaxation, meditation, yoga and counseling may be beneficial in reducing OLP.Moreover, to correctly diagnosis the etiology of OLP as psychosomatic disorder dentist should utilize his emotional intelligence and show empathy to understand patient in a better way.

Conclusion

The result of this study revealed that reticular type OLP has higher anxiety and serum cortisol level. Stress was most prevalent in 2nd and 3rd decade of life in females. Psychosomatic alterations like anxiety and depression have a significant role in OLP. Many of these diseases may be due to multifactorial etiology, where psychogenic factor constitutes an important role.This type of study has not been documented tilldate in northern part of India which gives a direct correlation between stress and oral lichen planus. Seeing these results, at this point, counseling should be mandatory in every part of life in school, collages, work place and relaxationtechniques should be made compulsory as a part of curriculum to withstand the stress.

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