

# A Comparison of Anxiety and Depression Levels between Oral Lichen Planus Patients and Healthy Controls

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**Abstract:** - Oral lichen planus (OLP) is a relatively common oral disease with an unclear etiology. Several studies support the opinion that psychological distress can participate the onset of OLP. Although there is a lot of contradictory evidences on this association. Based on this contradict, the purpose of the present study is to detect the importance of psychological factors in OLP patients by means of psychological tests, and make a meaningful comparison between the levels of anxiety and depression in OLP patients of our Department and the healthy population.

Our study was carried out on thirty patients with OLP diagnosis and histopathologic confirmation at the Oral Medicine Department, Faculty of Dentistry, and Tehran University of Medical Sciences. Thirty age and sex matched healthy volunteers served as the control group. The subjects filled 2 questionnaires including: Beck anxiety questionnaire, Beck depression questionnaire.

Our results show a significant difference in anxiety scores in two groups but we have found no statistically significant difference when the depression levels between two groups were assessed.

Our results analysis do not appear to support the concept that lichen planus is a disease that is seen in persons who are more depressed than the normal population but prolonged anxiety in many OLP patients may lead to psychomatization and may contribute to exacerbation or recurrence of this disease.

A substantial number of patients may benefit from a mutual collaboration between psychiatrists and oral medicine specialists in OLP management.

**Key words:** Oral medicine, Anxiety, Depression, Lichen planus

## I. INTRODUCTION

Oral lichen planus (OLP) is a relatively common oral disease. It occurs approximately 0.5% to 2.2% of general population. The mean age of affected patients is 55 years old and women involvement is higher than men [1]. OLP is the most common non-infectious disease among patients visiting Oral medicine Department, Faculty of dentistry, Tehran University of Medical Science. OLP also ranks fourth among all the chief complaints in this Department and comes after dental caries, gingival involvement and dry mouth [2].

Lichen planus can affect the oral mucosa, skin, genital mucosa, scalp and nails[3]. Clinically it may have one of four appearances on the oral mucosa: plaque like, reticular, atrophic and erosive. Most of the time oral mucosa is the only site of involvement. Several delicate white lines and tiny papules arranged in lacy, web like network known as "Wickham striae" are clinical characteristic of OLP[4]. Patients with plaque like or reticular forms of the disease are tend to be symptom-free, although atrophic and mostly erosive lesions cause severe symptoms. The main symptoms due to erosive form include: pain, soreness and bleeding. The consequences affect the patient's life in many ways such as difficulties in eating and drinking [5]. Furthermore it has been considered a chronic disease with the potential for malignant transformation that rarely undergoes spontaneous remission [6].

Since the precise etiology of OLP is not known there is not any promising treatment for it. Current data suggest cell mediated immune responses as the main etiopathogenesis, which in turn damage the basement membrane of mucosa

through a cytotoxic mechanism [7]. Additionally other factors such as medications ,virus antigens ,chemical substances ,stress , genetic [3], immunologic factors[8] and increased oxidative stress [9,10] can all participate in the development of OLP. These agents are able to activate the cell mediated immune responses.

Clinical wisdom and experience, as well as several studies, support the opinion that psychological distress can participate the onset, exacerbation or recurrence of OLP [3,12,13]. Although there is seemingly contradictory evidence on this association [14 ,15].

Oral mucosa is an extremely complex and vulnerable part of the body which is very reactive to psychological influences. Preda, in 1990 included OLP as one of psychosomatic diseases because of the significant relationship they found between the psychologically stressful occurrences and clinical occurrence of the disease [16].On the other hand OLP is an immunopathological disease that involves the cell mediated arm of the immune system.

The intimately intercalated relationship between immune system and psychological status has been mentioned since 200 AD.For example evidenced result showed melancholic women more susceptibility to breast cancer in comparison to sanguine women [17].

And then in 1951,George Day , a British clinician ,regarded unhappiness as a main factor involved in latent tuberculosis conversion to active form of the disease [18].Nervous, immune and endocrine systems are such mutually inter- related that they must be considered as a single big system rather than separated ones. Psychoneuroimmunology is a study field that tries to describe; crosstalk signals like chemical messengers that make connections among these three systems as a great network.It also shows how psychological stressors can cause a lot of disruption in the network [19].

We reviewed the available evidence on the role of stressful life occasions in triggering OLP.The evidences are not strong enough to consider stressful events as a risk factor for the onset, recurrence or exacerbation of OLP [14,15,20].

Alongside the causal influence of stressful life event, another factor that can affect onset, recurrence or evolution of psychosomatic disease is the psychological stress susceptibility of the patient. Hypothetical higher level of anxiety and depression in patient with OLP compared with control healthy group can suggest this susceptibility.

Several studies have investigated the role of psychological factors the pathogenesis of LP. Ambiguous data have been reported [3,12,13,14,20].

Based on this contradict, the purpose of the present study is to detect the importance of psychological factors in OLP patients by means of psychological tests, and make a meaningful comparison between the levels of anxiety and depression in OLP patients of our Department and the healthy population.

## II. MATERIALS AND METHODS

### A. *Participants and procedure*

Our study was carried out on thirty patient with OLP diagnosed at the Oral Medicine Department, Faculty of dentistry, Tehran University of Medical Sciences. Thirty age and sex matched healthy volunteers served as the control group.

The Inclusion criteria were as follow : a) patient with OLP exhibited the clinical features of the disease, with histopathologic confirmation(basal layer hydropic degeneration and a well –defined band like zone infiltration of lymphoid cell) based on a modification of the World Health Organization (WHO) definition[21] and were not taking

psychoactive drugs; b) control subjects, who were collected the same city, presented no oral mucosal lesions and were not taking psychoactive drugs.

All subjects had no history, symptoms or sign of systemic disease. The subjects filled 2 questionnaires including: Beck anxiety questionnaire, Beck depression questionnaire.

These two questionnaires accompanied by carefully worded cover letter were received by the patients who met the criteria for inclusion in the study, and explicit directions were given for their completion.

The Beck anxiety questionnaire was published and introduced by Beck and his colleagues on 1988. This consisted of twenty one multiple choice questions designed to evaluate a person's tendency toward anxiety, depending upon the manner in which the questions are answered[22].

Psychometric properties of the Iranian version of Beck Anxiety Inventory (BAI) were investigated by Kaviani and Mousavi. All results obtained on the Iranian version corresponded to those reported on the original version of Beck anxiety inventory. Their study supported the use of Iranian version of the questionnaire which demonstrated good psychometric properties with a high level of internal consistency

(Cronbach's  $\alpha = 0.92$ ) and reliability[23].

The Beck Depression Inventory (BDI) is perhaps the most commonly used screening instrument for depression in the general population. It is a Twenty one- question multiple choice self-report inventory. This is composed of items relating to symptoms of depression such as hopelessness and irritability, cognitions such as guilt or feelings of being punished, as well as physical symptoms such as fatigue, and lack of interest in sex. Mansour and Dadsetan examined the psychometric properties of a Persian-language version of the second edition of this instrument (BDI-II). The BDI-II-Persian had high internal consistency (Cronbach's  $\alpha=0.87$ ) and acceptable test-retest reliability ( $r=0.74$ ) [24].

### *B. Statistical methods*

The results are presented as means and standard deviations (Sd). The fit of the data to the normal curve was tested using the Kolmogorov-Smirnov test. The distributions of the analyzed variables were not significantly different from the normal curve; therefore parametric tests were used for further statistical analysis. Differences in the means between two independent groups were tested by means of T-test for independent groups.

## III. RESULTS

In the comparison between the group of patients with OLP and the control group, we obtain the following results:

The demographic summary of the case and control groups are presented in Table 1.

The age ranges are very similar for both groups. The patients are on the whole slightly older, but the difference between the mean age of two groups is statistically insignificant ( $t=0.413$ ,  $P= 0.68$ )

The mean score for anxiety is 35.26 for patients with OLP, and 18.23 for healthy controls and the difference between the groups is statistically significant (table 3).

In the Beck depression inventory, the control group values indicates no presence of depression but the OLP group shows a tendency toward depression; an insignificant differences appears when two groups are compared (Table 4)

#### IV. DISCUSSION

This study undertook to compare levels of anxiety and depression in OLP patients and control group referring to our Oral medicine Department. Our result shows a significant difference in anxiety scores in two groups but we have found no statistically significant difference when the depression levels between two groups were assessed.

The influence of psychological disorders such as anxiety and depression in oral lichen planus is still ambiguous [3,12,13,14,20]. The state of psychological profile can be influenced by individual factors and external factors of a society, which are interconnected. Patients can react differently to the same potential stressful situation, according to their personality, psychological characteristics, previous experiences, family mode and cultural values. There were not any evidenced-base results to confirm anxiety and depression as a hypothetical risk factor among our patients. On the other hand it is necessary to consider potential psychological disturbance in proper managements of OLP patients. The presence of the control group in our study gave us the opportunity for evaluation the psychological view of the OLP patients, in an area that has not received significant attention in the literatures.

Over the last 30 years numerous studies have indicated the role of chronic and long-lasting stress in the onset or exacerbation of diseases[25,26]. Stressful life events occurring just before the onset or recurrence of lichen planus have been reported in uncontrolled case series in percentages ranging from 10% to 45% [27]. Lowenthal and Pisanti examined 49 patients clinically diagnosed with OLP. Based on detailed history had been obtained from the patients, stressful events frequently preceded episodes of symptoms in patients with erosive lichen planus and such a relationship was not seen in patients with asymptomatic oral lichen planus But no control group was included in their study[28]. Moreover OLP patients with erosive OLP exhibit higher depression scores than patients with non-erosive OLP [11]. Based on some investigations OLP patients tend to be more depressed [5,11,29]. However this positive association has not always been confirmed [15]. We have not found statistically significant higher level of depression in Our OLP patients. Our study design is very similar to the Carla Girardi et al ,2011. They used” beck anxiety inventory” and” beck depression inventory” in 31 patient with lichen planus and 31 sex and age matched control group. Their results suggest an association of OLP with anxiety but there was no significant difference between two groups with respect to depression and anxiety. They also determined the level of salivary cortisol as an indicator of stress evaluation. The result showed no significant difference between case and control groups[30]. Hirota sk et al 2013 in a recent study assessed the level of anxiety and depression in OLP patients and control subjects, using self-report scale questionnaire. They also found no statistically significant difference in the level of anxiety and depression in two groups[20].

We found significantly higher level of anxiety in our OLP patients. In a study done by Ivanovski in 2005, significant difference between the OLP and control group were detected for blood cortisol levels and also mean values for hypochondriasis, depression, and anxiety[26].

Some authors suggested psychological support as supplementary therapeutic intervention for OLP

[ 12].They reported that level of anxiety and salivary cortisol in OLP patients were high and concluded that this disease has a close connection to anxiety and stress [12].

As a matter of fact, many aspects of immunologic responses can be adversely interrupted by psychological stress [31]. There is a study that shows even moderate amount of transient stress can cause transient immune response irregularities. For example, they found a conspicuous decrease in white blood cells ability to do their central role in immune system, during academic examination periods among diverse groups (healthy medical students, healthy high school students and asthmatic high school students). Natural killer cell activity was also diminished during examination periods [32].

Psychological stress establishes its impact on body by the multidirectional and close interrelations among the nervous, immune and endocrine system [33].

Hormones (epinephrine, cortisol) and neuropeptides affect immunocompetent cells through specific receptors, and the cells of the immune system affect the nervous and endocrine systems by means of cytokines [34].

It is of note that other researchers also reported associations between the psychological status of patients with OLP and their lymphocytes ratios. Chiappelli et al in their study of patients with LP with lesions on mucous membranes found a significant positive correlation between the level of mood and the ratios of lymphocytes CD4 and CD45RA+ (naive). The authors emphasized the physiological and clinical relevance of the mutual interactions between the patients' psychological mood and the transformation of virginal T lymphocytes CD4+ into memory lymphocytes responsible for co-operation with other cells of the immune system. They also observed a significant correlation between the level of mood and the number of circulating lymphocytes CD4 and CD62L (the selection determining adhesion to endothelial cells) which are a part of the population of virgin lymphocytes [35,36]. This finding parallels the associations between stress and immune response observed in other diseases, e.g. diabetes mellitus or cancers, and provides support that OLP also involves psycho-physiological and immune changes that can be of significance for its onset and course.

Our results analysis do not appear to support the concept that lichen planus is a disease that is seen in persons who are more depressed than normal population. Of course, this does not rule out the possibility that a special part of the population may be more vulnerable to the development of lichen planus, and in special groups the condition may be initiated by a degree of depression that would not cause the disorder in the reminder of the population. So a substantial number of patients may benefit from a mutual collaboration between psychiatrists and oral medicine specialists in OLP management.

Our findings are only preliminary that need to be replicated in larger samples. We encourage further researches focused on the role of anxiety and depression in the pathogenesis of this still poorly understood disease.

TABLE 1) DEMOGRAPHIC SUMMARY OF STUDY GROUPS

| Characteristics | Patients with OLP | Healthy control |
|-----------------|-------------------|-----------------|
| Men             | 9 (30%)           | 10(33%)         |
| Women           | 21(70%)           | 20(66%)         |
| Age range       | 35-66             | 39-66           |
| Mean age        | 50.6              | 49.83           |

TABLE 2) VALUES FOR ANXIETY AND DEPRESSION IN STUDY POPULATIONS

| Group   | Variable   | N  | M     | Sd    | Lower | Upper |
|---------|------------|----|-------|-------|-------|-------|
| Patient | Anxiety    | 30 | 35.26 | 7.86  | 21    | 54    |
|         | Depression | 30 | 36.53 | 7.70  | 23    | 52    |
| Control | Anxiety    | 30 | 18.23 | 8.59  | 12    | 32    |
|         | Depression | 30 | 32.96 | 10.05 | 17    | 45    |

TABLE 3) SIGNIFICANT DIFFERENCES BETWEEN ANXIETY LEVELS OF OLP PATIENTS AND CONTROL GROUP

| Levels   | Mean  | Sd   | N  | df | t    | sig  |
|----------|-------|------|----|----|------|------|
| Patients | 35.26 | 7.86 | 30 | 58 | 8.00 | 0.00 |
| Control  | 18.23 | 8.59 | 30 |    |      |      |

TABLE 4) INSIGNIFICANT DIFFERENCES BETWEEN DEPRESSION LEVELS OF OLP PATIENTS AND CONTROL GROUP

| Level   | M     | Sd    | N  | df | t    | sig  |
|---------|-------|-------|----|----|------|------|
| Patient | 36.53 | 7.7   | 30 | 58 | 1.54 | 0.17 |
| Control | 32.96 | 10.05 | 30 |    |      |      |

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