

Influences of Psychological Factors on Oral Lichen

Planus: A Review

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INTRODUCTION

Lichen planus (LP) is an etiologically unknown chronic inflammatory dermatosis that affects the skin, mucosa, nails, and hair. The pathogenesis of this disease is heavily influenced by the delayed-type cellular immune response mediated by T lymphocytes.(1–4) It occurs globally, primarily in the fifth to sixth decades of life, and is twice as common in women as in men. (4–7)OLP oral ulceration can cause varying degrees of pain and discomfort, and affected patients frequently experience significant impairment in eating, oral hygiene care, and speech. (5,8,9)It most commonly affects the skin and oral mucosa, but it can also affect the genitals, oesophagus, conjunctiva, skin appendages/scalp, hair, and nails.(9–11)

OLP is now recognised as a multifactorial disease characterised by a complex interplay of genetic and environmental factors such as patients' lifestyle, stress, depression, and anxiety.(4,10,12) Despite its negative impact on psychological well-being, the psychosocial burden of OLP on patients is frequently underestimated, overlooked, and/or inadequately managed by clinicians who may lack experience in assessing the biopsychosocial aspects of this oral condition. As a result, gaining a better understanding of the prevalence of psychiatric comorbidity and its potential effects on patients' lives may lead to changes in management approaches and, ultimately, better patient outcomes.(12,13)

Various studies involving OLP and psychological disorders are scarce and present controversial results. Various issues related to the disease pathogenesis have not yet been resolved. Thus, we conducted this review with aim to state “Is there any significant influence of psychological factor on Oral Lichen Planus.

DISCUSSION

OLP is postulated to result from an abnormal T-cell mediated immune response in which auto-cytotoxic CD8+ T cells trigger apoptosis of oral epithelial cells.(6,12,14) Stress, like other psychological changes, modifies and promotes immune dysregulation, including a shift in the balance of Th1/Th2 cytokines and an increase in Th2 response, which is linked to the development of autoimmune diseases.(4) The protective immunity is suppressed, exacerbating the chronic inflammation and increasing pro-inflammatory cytokines in the brain, such as IL-1, IL-6, and IL-10. As a result, neuroendocrine mediator-induced activation of the hypothalamic-pituitary-adrenal (HPA) and sympathetic-adrenal (SA) axes may exacerbate pain perception over time. n. Neuroendocrine immune system primarily the catecholamines furthers this process by increasing the function of cytotoxic T cells that result in keratinocyte apoptosis which is the hallmark of OLP.(5,12,15)

In this review total 20 studies were included which assessed the influence of anxiety depression, stress and sleep disturbance among OLP patient and compared them with healthy control group. Stating anxiety as unpleasant emotional state characterised by uneasiness, discomfort, and concern or fear about some defined or unknown future threat.(16) 3 studies assessed anxiety in OLP.(10,13,17,18) Similarly, considering depression as passing mood of unhappiness, sadness or the blues that we all experience from time to time as part of the normal pattern of life.(16) 1 study assessed depressions in OLP patient.(16) Also, stress is physical or mental strain that produces changes in the autonomic nervous system.(19) It was evaluated in few studies (Girardi,c, Pippi, C Kalkur, Gupta A, Manczyk, Anshul, Alessandra, Wiriyakijja) and single study assessed sleep disturbance among OLP patient as sleep disturbances (both insomnia and hypersomnolence) are associated with negative health outcomes.(20)

Influence of both depression and anxiety on OLP were assessed in 7 studies,(1,3,7,11,21–23) 8 studies assessed combine influence of depression, anxiety and stress on OLP.(4,6,8,24–28) While single study was attempted to assess influence of depression, anxiety and sleep disturbance among OLP patients.(20)

Considering the demographic data available in all 20 studies it was observed that higher overall prevalence of OLP sign were common in patient between 4th to 6th decade of life and having more female predilection. (1,3,4,6,7,11,13,17,18,20–22,27,28)

Measuring has only become a routine part of healthcare practise and research in the last 60 years.(29) Anxiety, depression, stress, and sleep disturbance are all subjective experiences or theoretical constructs that cannot be directly measured but must be inferred from observable patterns of behaviour, such as rating scale responses. Self-report instruments and clinician-administered rating scales can help clinicians identify, quantify, and track change in these critical but intangible variables.

BECK ANXIETY INVENTORY (BAI)

The Beck Anxiety Inventory (BAI) is the gold standard for self-reporting general anxiety symptoms. The BAI scores were calculated by adding the participant's responses for each of the 21 items. Each item was made up of a series of affirmations with response options ranging from 0 to 3, with a possible total score of 63. Anxiety and depression were classified as minimal (0 to 9), mild (10 to 16), moderate (17 to 29), or severe using this score (30 to 63). The PSS 14, on the other hand, had 14 questions that ranged from 0 to 4, with a maximum score of 56. With no cut-off point, higher scores indicated higher levels of stress. The BAI scores were dichotomized as the absence (minimal and mild levels) or presence (moderate and severe levels) of anxiety and depression, constituting the variable denominated an anxiety-depressive component. (28,29)

Girardi, Pier, GI Kurmuş used BAI index to assess anxiety among OLP patient. In Girardi study found no significant correlation between anxiety and OLP.(4) While Pier, GI Kurmuş found positive correlation between anxiety and OLP.(3,28) (Described in table 1)

THE HAMILTON RATING SCALE FOR ANXIETY (HAM-A)

The "Hamilton's anxiety scale" (HAM-A) was used to assess anxiety levels, which includes measures of overall anxiety, psychic anxiety (mental agitation and psychological distress), and somatic anxiety (physical complaints related to anxiety). This scale consists of 14 questions, seven of which address psychic anxiety and the remaining seven address somatic anxiety. For each of the 14 items, the individuals were graded on a five-point scale ranging from 0 (not present) to 4. (severe). The total anxiety score ranges between 0 and 56. Patients with a total score of 18 are classified as having mild anxiety, patients with a score of 19 to 25 are classified as having moderate anxiety, and patients with a score of 30 are classified as having severe anxiety.(10,13)

D Adamo, Zucoloto M L, Nadendla used HAMA index to assess anxiety in OLP patients. They found significant correlation between anxiety and OLP.(10,13,20) (Described in table 1)

STATE AND TRAIT ANXIETY INDEX (STAI)

STAI produces separate measures of situational (state) and enduring (trait) anxiety. In the state anxiety test, subjects were asked to describe how they felt at a specific time. Participants in the trait anxiety test were asked to describe how they generally feel. The 20 state anxiety and 20 trait anxiety items were rated on a 4-point intensity scale ranging from 1 ("not at all") to 4 ("very much so"). The scores for each of the two scales ranged from 20 to 80.(6,11,17)

Pippi, Gavic L, K Valter used STAI index for assessment of anxiety in OLP patients. Pippi found non significant correlation between anxiety and OLP. (6)While Gavic L and K Valter found significant correlation between state and trait anxiety among OLP patients.(11,21) (Described in table 1)

Self-rating Anxiety Scale (SAS)

Zung Self-rating Anxiety Scale (SAS): The Zung Self-rating Anxiety Scale was used to assess the anxiety of OLP patients. It is made up of 20 items that reflect both emotional and physical symptoms. 15 of them indicate negative experience, scoring from 1 (a little of the time) to 4 (all of the time), and 5 indicate positive experience, scoring in the opposite direction (1 point: all of the time; 4 points: a little of the time). Raw score 1.25 is calculated by taking the total score of all items. The greater the score, the more concerned the respondent. Chinese SAS national norms have a standard score of (33.80 5.90). (Wang & Chi, 1984; Shen et al., 2012). A SAS standard score of 50 is the standard benchmark for anxiety in China, and anxiety is classified into three levels: mild anxiety (50-59 points), moderate anxiety (60-69 points), and high anxiety (70+ points) (70-80 points) (18)

Liao used SAS index to assess anxiety in OLP patients. He found significant correlation of OLP and anxiety. (18)(Described in table 1)

PERCEIVED STRESS SCALE(PSS)

The Perceived Stress Scale (PSS) was used to assess the degree to which life situations were perceived as stressful. The PSS items were designed to assess how unpredictable, uncontrollable, and overwhelming the subjects' lives were. The participants were asked to rate their frequency of use on a 5-point scale ranging from 0 ("never") to 4 ("very often"). The items' responses represented a psychological stress score, with higher scores indicating more psychological stress.(6,8,28)

Pippi, Pires, Wiriyaikijja P used PSS index to assess stress in OLP patients. They found significant correlation of OLP and stress.(6,8,28) (Described in table 1)

Lipp's Inventory of Stress Symptoms for Adults (LISS)

Lipp's Inventory of Stress Symptoms for Adults (LSSI): This is a 53-item tool for screening stress symptoms in adolescents and adults. The LSSI identifies and categorises physical and psychological symptoms based on the three stages of stress: alarm (initial stage -.6 points in domain A), resistance (intermediary stage -.3 points in domain B), and exhaustion (last stage) (stage when diseases may occur in more susceptible organs -.8 points in domain C). The instrument aids in determining whether the symptoms are physical or psychological in nature.(30,31)

Girardi used this scale to evaluate stress among OLP patient. He found no significant correlation between stress and OPL.(4) (Described in table 1)

HAMILTON RATING SCALE FOR DEPRESSION (HAM-D OR HRSD)

The HAM-D is a depressive symptom severity rating scale. HAM-D assesses 21 affective field items. The scale runs from 0 to 54. The severity of the symptoms is represented by a total score. A score of 10 or higher indicates impairment. Scores ranging from 10 to 17 indicate mild depression, 18 to 24 indicate moderate depression, and scores greater than 24 indicate severe depression. The HAM-A is a rating scale that was created to assess the severity of anxiety symptoms. It is made up of 14 items, each defined by a set of symptoms. The score can range between 0 and 56. A score of 17 or less indicates mild anxiety, 18-24 indicates mild to moderate anxiety, and 25-30 indicates moderate to severe anxiety.(20,29)

Maheshwari and D Adamo used HAM-D index to assess depression in OLP patients. They found significant correlation between depression and OLP symptoms.(16,20) (Described in table 1)

BECK DEPRESSION INVENTORY (BDI)

The Beck Depression Inventory-II (21) is a self-reported depression assessment tool. It consists of 84 self-evaluative statements organised into 21 categories that assess depression's affective and cognitive symptoms. The items were rated in order of severity from 0 to 3, with 0 indicating the absence of a specific symptom. The scores for each item were added up, yielding a score range of 0-63.(6,11,28) (**Pippi, Gavic L, Alessandra**)

Girardi, K Valter, Pippi, Galvic L, GI Kurmuş, Pires A used BDI scale to assess depression in OLP patients. Girardi and Pippi found no correlation between depression and OLP. (4,6) K Valter, Gavic L, **GI Kurmuş, Pires A** found significant correlation between depression and OLP. (3,11,21,28) (Described in table 1)

PITTSBURGH SLEEP QUALITY INDEX (PSQI)

The PSQI 32 is a self-report questionnaire designed to assess sleep quality and disturbances. This instrument consists of 19 items that produce seven 'component' scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. Each item is assigned a score ranging from 0 to 3, with higher scores indicating poorer sleep or more frequent sleep problems. Items are combined to produce seven components (scores ranging from 0 to 3), and the sum of these seven scores produces one global score ranging from 0 to 21. With high sensitivity (90-99%) and specificity (84-87%), global scores greater than five distinguish poor sleepers from good sleepers. (20)

D Adamo used PSQI index to assess sleep quality in OLP patients. He found that there is significant correlation between quality of sleep and OLP.(20) (Described in table 1)

HOSPITAL ANXIETY AND DEPRESSION SCALE(HADS)

The Hospital Anxiety and Depression Scale [HADS; Polish adaptation by De Walden et al. (2000)] is a 14-item self-report anxiety and depression assessment that is widely used in clinical practise. The scale is divided into two subscales: anxiety (HADS-A) and depression (HADS-D), each with seven items. Each item is graded on a scale of 0 to 3. As a result, the depression and anxiety subscale scores range from 0 to 21. A score of 0 - 7 for either subscale indicates a normal range, a score of 8 -10 indicates a moderate risk of a mood disorder, and a score of 11 - 21 indicates the presence of a mood disorder.(7,8,22,23)

Shetty, Radwanoczko, Yang, Chaitanya N, Wiriyaakijja P used HADS index to assess anxiety and depression among OLP patients. Shetty, Yang, Chaitanya N, Wiriyaakijja P found significant correlation of anxiety and depression with OLP.(1,8,22,23) While Radwanoczko stated non significant correlation of OLP with anxiety and depression.(7) (Described in table 1)

DEPRESSION ANXIETY STRESS-SCALE (DASS)

Data was collected using the DASS-21. The questionnaire contains 21 symptoms divided into three subscales of seven items each to assess depression, anxiety, and stress. The patients were asked to rate the severity of each symptom over the previous week on a four-point scale ranging from 0 ("did not apply to me at all") to 3 ("applied to me very much or most of the time"). Following that, the total number of points for each subscale was calculated and multiplied by two. The severity of a given negative emotion was classified as normal, mild, moderate, severe, or extremely severe based on the score.(24,26,27)

C Kalkur, Gupta A, Manczyk, Anshul used DASS index to assess depression, anxiety and stress among OLP patients. C Kalkur, Manczyk, Aggarwal A found significant correlation of depression, anxiety and

stress in OLP patients.(24,26,27) But Gupta A found non significant correlation between OLP patients and depression, anxiety and stress.(25) (Described in table 1)

Conclusion

To summarise, psychological factors have a significant influence on oral lichen planus. This study found that patients with LP had a high prevalence of current signs of anxiety, depression, stress and sleep disturbance, as well as a positive and significant association between OLP and signs of anxiety, depression, stress and sleep disturbance. Because there is an increase in stress, anxiety, depression, and sleep disturbance in everyday life for a variety of reasons, dental practitioners are more likely to encounter patients with such disorders. As a result, when treating oral lichen planus, one should consider psychological factors and try to manage them with psychiatrists as needed.

Acknowledgements: None.

Declarations:

Conflict of interest: The authors declare that they have no conflicts of interest.

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Table 1: Characteristics of studies included in review

Sr.No	First Author Year	Continent	Study Design	Mean Age of OLP Patients	No. Of OLP Patients and Controls	Gender	Psychiatry	Questionnaire Used	Conclusion
1	Shetty, 2010	India	Case control	45 years 41-50	15/15	Male	Anxiety, Depression	HADS	Anxiety and depression score were higher in OLP group as compared to control group. No significant difference between anxiety and depression between erosive and non-erosive type of OLP.
2	Maheshwari 2010	Iran	Case control	NA	29/21	NA	Depression	HAM-D	Significant stress and depression association with OLP seen.
3	Girardi, 2011	Brazil	Case control	53.8±10.46years	31/31	Female	Depression, Anxiety, Stress	BDI, BAI, LISS	No significant difference in Score of OLP and control group was seen for depression, anxiety and stress

4	K Valter, 2013	Croatia	Case control	61.04 years	50/50	Female	Anxiety, Depression	STAI, BDI-II	Significant difference between anxiety and depression score between OLP and control group
5	D Adamo 2014	Italy	Case control	55±7.23 years	50/50	Female	Sleep, Depression, Anxiety	PSQI, ESS, HAM-D, HAM-A	Sleep disturbance was significantly higher for patients with OLP with mild depression and mild anxiety
6	Pippi, 2014	Rome	Case control	53-57 years	20/14	Female	Anxiety, Depression, Stress	STAI, BDI, PSS	OLP subjects showed a slight and non-significant increase in anxiety symptoms and components of depression. OLP patients exhibited higher scores for stress
7	Nadendla, 2014	India	Case control	NA	20/20	NA	Anxiety	HAM-A	The mean anxiety scores of the OLP group showed highly significant difference from the controls.

8	Gavic L,2014	Croatia	Case control	49.04±8.27 years	112/112	Female	Depression, Anxiety	BDI, STAI	High correlation between anxiety, depression, and psychological stress with symptoms of RAS and OLP has been observed.
9	Alves M, 2014	Brazil	Case control	51.29±12.92 years	48/48	Female	Anxiety	STAI-S, STAI-t	High correlation seen between anxiety and depression with OLP patient
10	C Kalkur et al., 2015	India	Case control	Matched	25/25	Matched	Depression, Anxiety, Stress	DASS	The patients with OLP were found to exhibit greater depression than control group on the depression scale, anxiety scale and stress scale
10	Radwanoczko M,2017	Poland	Case control	59.6±12.44 years	42/42	Female	Anxiety, Depression	HADS	No significant relationship between the prevalence of psychological factors and psychopathological symptoms in terms

									of extension, severity and activity of the OLP
11	Gupta A, 2017	India	Case control	Matched	39/39	Matched	Depression, Anxiety, Stress	DASS-21	There was no correlation between depression, anxiety, or stress scores, as assessed with the DASS-21,
12	Yang et al., 2018	China	Case control	47.22 ± 12.70 years	45/45	Female	Anxiety, Depression	HADS, OHIP-14	OLP showed positive correlation with anxiety and depression
13	Zucoloto M L et al., 2019	Brazil	Case control	60.35±12.68 years	87/87	Female	Anxiety	HAM-A and OHIP-14	A statistically significant was observed in OLP patient.
14	Manczyk et al., 2019	Poland	Case control	63.12±13.01 years	26/26	Female	Anxiety, Depression, Stress	DASS-21	OLP exhibited significantly higher mean levels of depression, anxiety, and stress compared with the control subjects.
15	GI Kurmuş et al., 2019	Turkey	Case control	48.6±15.6 years	20/20	Female	Depression, Anxiety	BDI, BAI	LP patient depression and anxiety levels were higher compared to

									controls
16	Aggrarwal A, 2020	India	Case control	Matched	30/30	Female	Depression, Anxiety, Stress	DASS	Significant increased levels of Depression, anxiety and stress in patients with OLP
17	Pires A, 2020	Brazil	Case control	49.19±13.97 years	21/21	Female	Anxiety, Depression, Stress	BAI, BDI, PSS	A statistically significant association was also seen for the anxiety-depression-stress component.
18	Liao et al., 2020	China	Case control	51.89±13.34 years	174/174	Female	Anxiety	Self-rating Anxiety Scale (SAS)	Significant association seen with OLP and anxiety
19	Chaitanya N, 2020	India	Case control	37.83 years	30/30	Female	Anxiety, Depression	HADS	Higher depression and anxiety levels were significantly associated with OLP patient.
20	Wiriyakijja P et al., 2020	UK	Observational study	63.32±11.22 years	260	Female	Anxiety, Depression, Stress	HADS, PSS	Higher depression and anxiety levels were significantly associated with OLP patient.