Stressful Life Events and Oral Lichen Planus: A case–control study

Author:

Dr. Sanjib Kumar Khataniar. MDS, Ph.D.
Professor and Head,
Department of Oral Medicine & Radiology,
Regional Dental College, Guwahati, Assam, India
Email: skhataniar76@gmail.com

ABSTRACT

Background and Objective:

Oral lichen planus (OLP) is a chronic, immune-mediated inflammatory disease of the oral mucosa. Psychosomatic factors and their association with dermatological disorders are well recognized, yet their importance in OLP is debate. OLP is a relatively common oral soft tissue disorder, still the exact cause is remained unknown. The purpose of this case–control study was to determine any possible association between stress and patients with different types of OLP, who attended the outpatient department of Oral Medicine and Radiology, KLES's Institute of Dental Sciences, Belgaum, Karnataka (India).

Materials and Methods:

Total 80 subjects with different age and sex were included in the study into two groups i.e. Group A and Group B, where Group A is comprised of 40 subjects with clinically and histopathologically confirmed OLP and Group B is comprised of age and sex matched 40 normal healthy individuals. The measuring instrument of psychological state to assess the stress, Presumptive Stressful Life Events Scale (PSLES) by Gurmeet Sing, Dalbir Kaur, Harsharan Kaur, which allowed to know the degree of stress, was subjected to all 80 patients. The readings from both Group A and Group B subjects were tabulated for statistical analysis.

Results:

The mean score of PSLES of different types of OLP patients were significantly higher as compared to the control group. The mean score for PSLES in the study group were 321.4 and 183.3 in control group ($p<0.001$). We found that the stress levels, PSLES score in OLP group were significantly higher than in the control group.

Interpretation and Conclusion:

The present study revealed that the mean score of PSLES of different types of OLP patients were significantly higher as compared to the control group. Our findings concluded that OLP is closely related with stress. The evaluation of the PSLES score, seems a promising parameter for investigation of OLP. Thus besides traditional treatment of OLP, psychological support is also needed.

Keywords: Oral lichen planus; Stress; Presumptive Stressful Life Events Scale.

Abbreviations: Oral lichen planus- OLP, Presumptive Stressful Life Events Scale -PSLES.

INTRODUCTION

Oral lichen planus (OLP) is a chronic, immune-mediated inflammatory disease of the oral mucosa. OLP is often referred to as "stress-related" or "stress-associated" disorder of the oral mucosa[1]. **Lichen planus** is a common mucocutaneous disorder that affects the skin, nails, hair and mucous membranes, either separately or in combination[2]. **OLP** is generally recognized as a chronic inflammatory disorder of the oral mucosa of unknown etiology, which affects up to 2% of the population, predominantly women[1,3,4]. The World Health Organization classifies OLP into seven clinical forms: reticular, papular, plaque-like, atrophic, erosive, ulcerative and bullous[5].

The histological features of OLP include epithelial acanthosis and hyperkeratosis, atrophy with liquefactive degeneration of the basal cell layer, saw tooth rete ridges and a dense sub basilar infiltration of T-lymphocytes[6,7].

The etiology of OLP is still not understood. However, current evidences suggest that immunological mechanisms are involved in its pathogenesis. Both cutaneous and oral lichen planus are currently considered to result from a cell-mediated immune response to antigenic changes in the skin or mucosa[8,9].

It has been suggested that OLP could have a psychological component in its etiology and indeed, patients often relate the onset, or an exacerbation of their condition to stressful life events[10,11,12,13].

Stress alters the regulation of both the sympathetic and the parasympathetic branches of the autonomic nervous system, with consequential alterations in hypothalamic control of the endocrine response controlled by the pituitary gland. Autonomic activation and the elevation of hormones, including those produced by the hypothalamic-pituitary-adrenal axis, play pivotal roles in regulating immune surveillance mechanism, including the production of cytokines that control the inflammatory process[1]

The aim of this study is to determine the association between stress and patients with OLP by using psychological testing instrument (Presumptive Stressful Life Events Scale - PSLES) by case-control method.

AIMS AND OBJECTIVES

The present study was carried out to:-

1. Determine any possible association between stress and patients with oral lichen planus.
2. Assess the Presumptive Stressful Life Events Scale - PSLES in different forms of oral lichen planus.
3. Compare the results with those of the control group.

MATERIALS AND METHODS

The present study is undertaken to determine any possible association between stress and Oral lichen planus (OLP). Subjects were selected in this case–control study from the Outpatient Department of Oral Medicine and Radiology, KLES's Institute of Dental Sciences, Belgaum,Karnataka(India) during a period from 2003 to 2006.

Selection Criteria:

80 subjects were included in the study. The subjects were divided into two groups i.e. Group A and Group B.

Group A:

This group comprised of 40 subjects with clinically and histopathologically confirmed OLP. Subjects belonging to different age, sex and clinical presentation were included in the study.

Group B:

This group comprised of age and sex matched 40 normal healthy individuals.

The measuring instruments of psychological state to assess the stress were applied to all patients. Presumptive Stressful Life Events Scale (PSLES) by Gurmeet Sing, Dalbir Kaur, Harsharan Kaur, which allowed to know the degree of stress, was subjected to all 80 patients. PSLES is a modified scale of Holme's and Rahe's "Social Readjustment Rating Scale - (SRRS)", mainly for Indian population. The scale consists of 51 oriented item to search the changes or recent experiences in the past12 months. The questionnaire was applied to all the patients in his/her native language. Every item or event of the scale has their mean score of a highest 95 to the lowest 20. Total score was calculated by adding all individual item scores that the patient had experienced. Scoring criterion as per original author recommendation was employed in this study. Informed consent was taken from all the subjects.

Statistical Analysis

All the variables computed from the study, for example age, sex and PSLES score were statistically analyzed for the mean values, standard deviation, standard error and range. 'Unpaired student's t-test' was used to assess the statistical significance between the mean values for the respective variables.

PRESUMPTIVE STRESSFUL LIFE EVENTS SCALE (PSLES)

Rank No.	Life events	Score
1	Death of spouse	95
2	Extra-marital relation of spouse	80
3	Marital separation/ divorce	77
4	Suspension or dismissal from job	76
5	Detention in jail of self or close family member	72
6	Lack of child	67
7	Death of a close family member	66
8	Marital conflict	64
9	Property or crops damaged	61
10	Death of friend	60
11	Robbery or theft	59
12	Excessive alcohol or drug use by family member	58
13	Conflict with in-laws (other than over dowry)	57
14	Broken engagement or love affair	57
15	Major personal illness or injury	56
16	Son or daughter leaving home	55
17	Financial loss or problems	54
18	Illness of family member	52
19	Trouble at work with colleagues, superiors or subordinates	52
20	Prophecy of astrologer or palmist etc.	52
21	Pregnancy of wife (wanted or unwanted)	52
22	Conflict over dowry (self or spouse)	51
23	Sexual problems	51
24	Self or family member unemployed	51

25	Lack of son	51
26	Large loan	49
27	Marriage of daughter or dependent sister	49
28	Minor violation of law	48
29	Family conflict	47
30	Break-up with friend	47
Rank No.	**Life events**	**Score**
31	Major purchase or construction of house	46
32	Death of pet	44
33	Failure in examination	43
34	Appearing for an examination or interview	43
35	Getting married or engaged	43
36	Trouble with neighbour	40
37	Unfulfilled commitments	40
38	Change in residence	39
39	Change or expansion of business	37
40	Outstanding personal achievement	37
41	Begin or end schooling	36
42	Retirement	35
43	Change in working condition or transfer	33
44	Change in sleeping habit	33
45	Birth of daughter	30
46	Gain of family new member	30
47	Reduction in number of family function	29
48	Change in social activities	28
49	Change in eating habits	27
50	Wife begins or stop work	25
51	Going on pleasure trip or pilgrimage	20

RESULTS AND OBSERVATIONS

This study was undertaken to evaluate any association between stress and in patients with Oral Lichen Planus.

Results of Group A :

40 patients with OLP studied, the patients were belonging to age range between 21 years to 75 years. Maximum numbers of patients (35%) were in the age group 21 years to 30 years. The mean age was 39.93±14.19 years. (Table-1)

Table 1: Age Wise Distribution of Patients in Group A

Age	Male	Female	Total
0 - 10	0	0	0
11 - 20	0	0	0
21 - 30	10	4	14
31 - 40	7	4	11
41 - 50	2	2	4
51 - 60	4	5	9
61 - 70	1	0	1
71 - 80	0	1	1
Total	24	16	40

Out of 40 patients, 24 were males and 16 were females with a male to female ratio 3 : 2. (Table 2)

Table 2: Sex Wise Distribution of Patients in Group A

Male	Female	Total
24 (60%)	16 (40%)	40

Out of 40 patients of OLP studied, the commonest involvement site was the buccal mucosa (82.5%) followed by tongue (30%),gingivae (15%), lip (10%) and palate (7.5%). Out of 40 patients of OLP studied, maximum patients (60%) had reticular type of OLP, followed by erosive form (25%) and least common was plaque type (15%).

In the 40 OLP patients in relation to the amount of vital events and stress, it was observed that the mean value of PSLES was 321.4±66.06. Out of 40 OLP patients, the mean PSLES value of 24 male patients was 315.58 and for 16 female patients was 330.13 (Table 3).

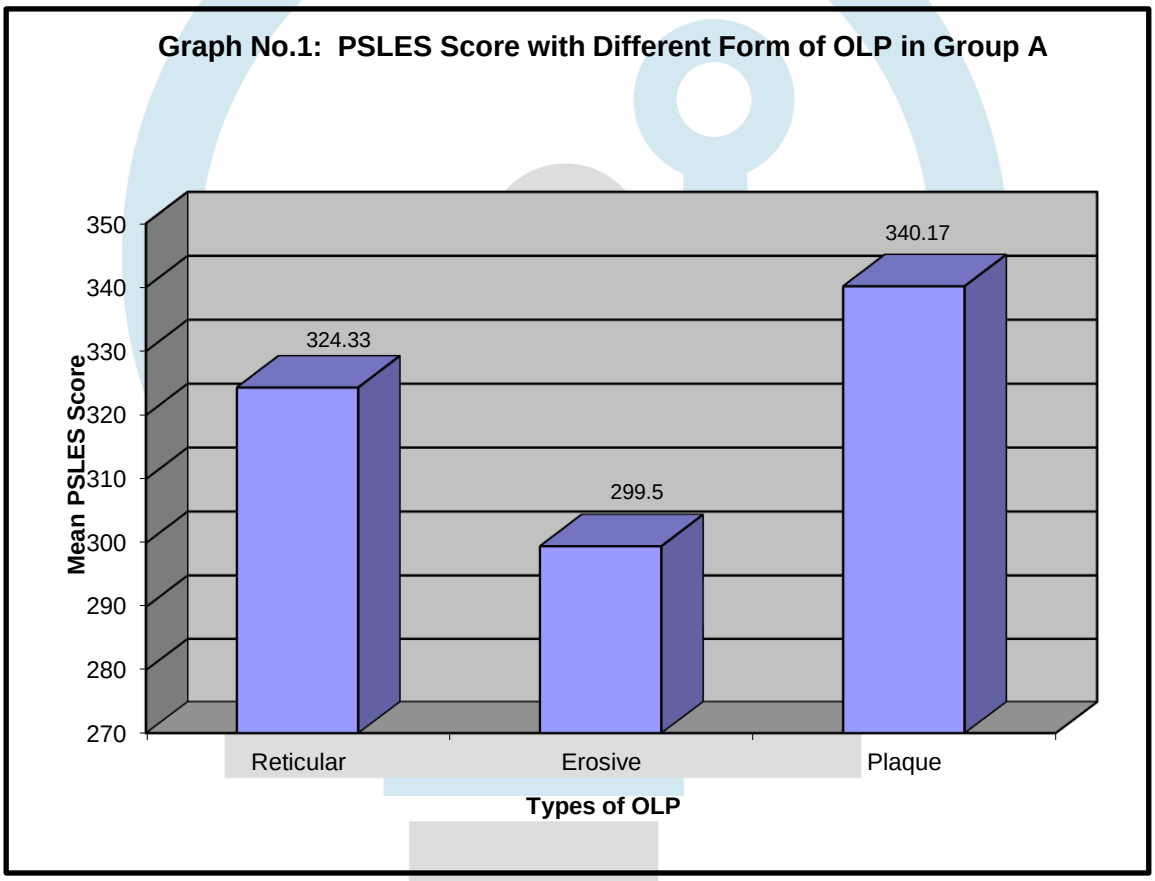
Table 3: PSLES Score in Patients with Group A

Sex	Total No.	Mean PSLES Score
Male	24	315.58
Female	16	330.13

PSLES score for different clinical form of OLP were studied in all 40 OLP patients. The mean PSLES score in reticular form of OLP was 324.33±68.38. For erosive and plaque type OLP it was 299.5±60.73 and 340.17±64.46 respectively. (Table-4; Graph-1)

Table 4: PSLES Score with Different Form of OLP in Group A

Types	Total No.	PSLES Value (mean±SD)
Reticular	24	324.33±68.38
Erosive	10	299.5±60.73
Plaque	6	340.17±64.46



RESULTS OF GROUP B:

Out of 40 control subjects studied, 23 (57.5%) were males and 17 (42.5%) were females. These cases were ranged from 21 years to 80 years. The mean age was 38.13±12.88 years.

Among 40 subjects evaluated for PSLES, it was observed that the mean values of PSLES was 183.3±53.75.The mean value of PSLES for 23 male patients was 193.04 and for 17 female patients it was 170.18 (Table 5).

Table 5: PSLES Score in Patients with Group B

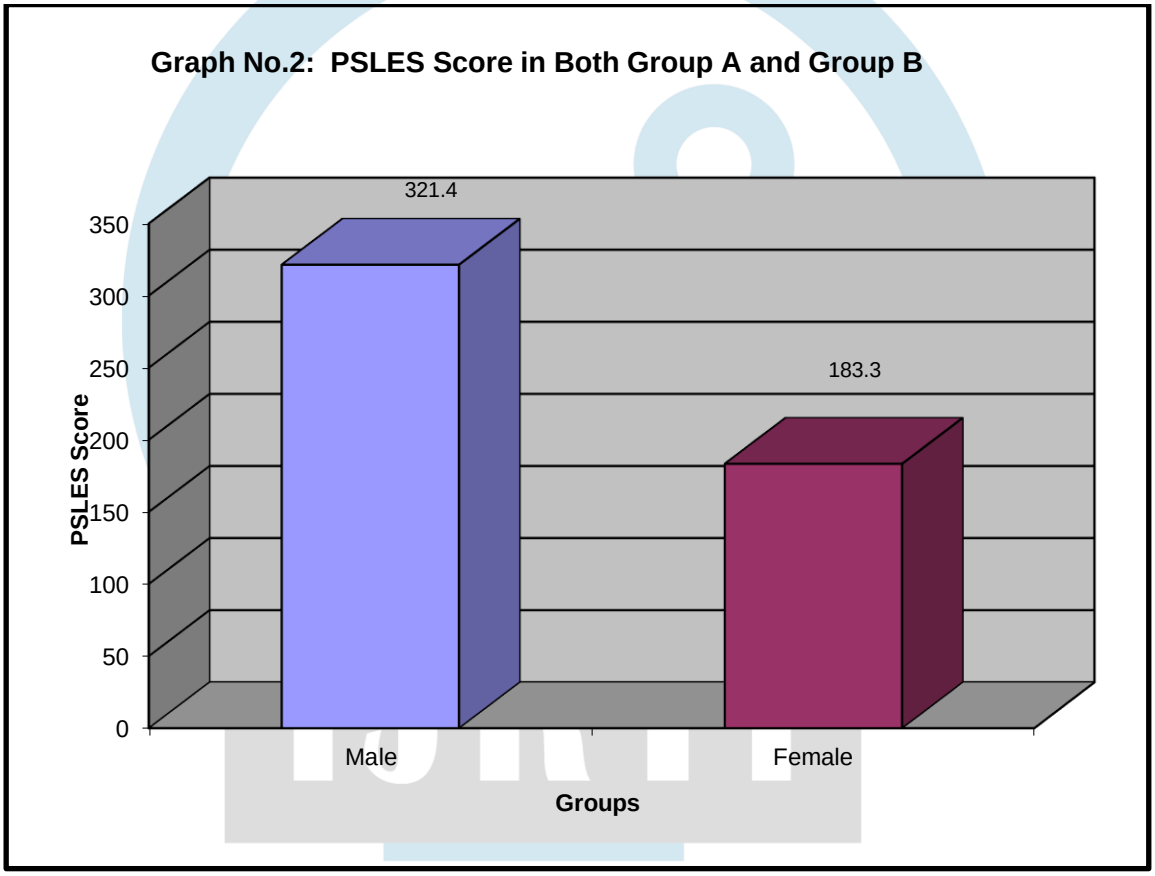
Sex	Total No.	Mean PSLES Score
Male	23	193.04
Female	17	170.18

Comparison of Group A and Group B:

The mean PSLES score were 321.4 in Group A and 183.3 in Group B (Table 6, Graph 2).

Table 6: PSLES Score in Both Group A and Group B(mean±SD) of patients

Group	PSLES Score	p-value
A	321.4	<0.001
B	183.3	<0.001



The result showed a highly significant difference in PSLES score level in both the groups (p<0.001).

DISCUSSION

First described by Erasmus Wilson in 1869, Lichen Planus is a disease that affects the skin, scalp, nails and mucosa[14,15].

Lichen planus is a chronic inflammatory epidermal and mucosal disease reportedly affecting 0.5% to 2.0% of the general population, with a mild predilection for females and a mean age of onset in the fourth to fifth decade[4,6].

OLP has a chronic course, with a possible malignant transformation. The exact cause is unknown; numerous studies support the hypothesis that it is a complex immunologic disease mediated by cytotoxic T-cells directed against basilar keratinocytes[16,17].

An attempt has been made to associate OLP with a variety of systemic maladies such as diabetes mellitus, rheumatic collagen diseases, chronic stress syndrome, hypertension, viral infections, HLA predispositions and idiosyncratic drug reactions. However, these associations have relied primarily on anecdotal evidence, as the true cause of lichen planus remains poorly defined[6].

Although stress is commonly considered as a factor in the development and progression of OLP, little documentation has been presented to substantiate this widely held assumption.

This particular study is carried out to establish an association between OLP and stress by evaluating PSLES (Presumptive Stressful Life Events Scale) score.

When patients with OLP (Group A) are evaluated by the psychometric test using Presumptive Stressful Life Events Scale (PSLES), it was observed that the levels of stress has presented highly significant differences with the control group (Group B) ($p<0.001$). The mean PSLES score of stress in OLP cases was 321.4, whereas the mean score in control group was 183.3. These significant differences showed that patients with OLP are associated with high level of stress.

Soto-Araya M, et al.[18] in 2004 found a high level of stress, anxiety and depression in OLP patients using two psychological test instrument, the Test of recent experience and HAD scale. Burkhart et al.[11] in 1996 also pointed out that more than half of his patients with OLP related high level of stress in relation to work, relationship and losses, before or during the appearance of the condition. Hamf et al.[17] in 1987 determined an important degree of psychic disturbances and discomfort in their patients with OLP at the moment of clinical examination. The results of the present study showed statistically significant difference of PSLES score in different type of OLP ($p<0.001$). The mean PSLES score was higher in plaque type OLP (340.17) as compared to erosive type (299.5) and reticular type (324.33). The results suggested a high level of stress associated with non-erosive OLP. McCartan BE[19] in 1995 found a high level of anxiety in cases of non-erosive OLP, whereas Lowental and Pisanti[20] in 1984 establish them for the erosive-bullous form.

Chronic stress can cause a reduction in mitogenesis, alteration in lymphocytes, reduction in ratio of T-helper cells to T-suppressor cells and an elevation in the number of natural killer cell[11,21].

The present study confirms that this disease is closely related with stress. Increase level of stress causes an altered immune function in the body, which is responsible for the tissue alteration in the mucosal surface.

CONCLUSION

In the present study, the analysis of PSLES score revealed a significant difference in between the Group A (OLP) and Group B (Control). The mean PSLES score is higher in OLP patients as compared to control subjects ($p<0.001$). Hence, the present study confirms that this premalignant condition (OLP) is closely related with stress. This psychological alteration forms a starting point for the initiation of various autoimmune reactions, which have been shown to be contributory to the pathogenesis of OLP. The evaluation of the PSLES score seems a promising parameter for investigation of OLP. So, all the OLP patient should be provided with psychological counselling and treatment, which will increase their ability to cope with stress together with traditional treatment modality depending upon the type, extent and severity of the lesion.

REFERENCES

1. Francesco C, Olivia SC. Psychologic views on stress-related oral ulcers. Quintessence Int. 2004; 35:223-227.
2. Sylvie B, Camille F, Marie-Christine B, Henri S, Yves Le C. Immunohistochemical study of oral lesions of Lichen planus : Diagnostic and pathophysiologic aspects. Oral Surg Oral Med Oral Pathol 1990; 70:462-5.
3. Ronald WK, Jaime SB, William DT. Oral squamous cell carcinoma arising in a patient with long-standing lichen planus - A case report. Oral Surg Oral Med Oral Pathol 1990; 70:282-5.
4. Sandra LM, Nelson LR, Heather MP, James SH, Shanti K. A retrospective survey of oral lichenoid lesions: Revisiting the diagnostic process for oral lichen planus. Oral Surg Oral Med Oral Pathol 2002; 93:676-81.
5. Chaiyarit P, Kafrawy AH, Miles DA, Zunt SL, Van Dis ML, Gregory RL. Oral lichen planus: an immunohistochemical study of heat shock proteins (HSPs) and cytokeratins (CKs) and a unifying hypothesis of pathogenesis. J Oral Pathol Med 1999; 28:210-5.
6. Vincent SD, Fotos PG, Baker KA, Williams TP. Oral lichen planus : The clinical, historical, and therapeutic features of 100 cases. Oral Surg Oral Med Oral Pathol 1990; 70:165-71.
7. Walton LJ, Thornhill MH, Farthing PM. VCAM-1 and ICAM-1 are expressed by Langerhans cells, macrophages and endothelial cells in oral lichen planus. J Oral Pathol Med 1994; 23:262-8.

8. SR Porter, Alun K, Irwin O, W Barrett. Immunologic aspects of dermal and oral lichen planus - A review. Oral Surg Oral Med Oral Pathol 1997; 83:358-66.

9. Mariana VD, Maria C, Raftael D, Felix JT. Oral lichen planus: Immunohistology of mucosal lesions. J Oral Pathol Med 2002; 31:410-4.

10. Drore Eisen. The clinical features, malignant potential and systemic associations of oral lichen planus: A study of 723 patients. J Am Acad Dermatol 2002; 46:207-14.

11. Nancy WB, Eileen JB, Jefferson B, Laurie W. Assessing the characteristics of patients with oral lichen planus. JADA 1996; 127 : 648-62.

12. Basu, Shalini; Srivastava, Sunita; Sinha, Abhıshek; Iqbal, Haider; Mishra, Anuj; Singh, Yakshi. Assessment of Stress, Anxiety, and Depression in Oral Lichen Planus Patients: A Hospital-Based Study. Journal of Indian Academy of Oral Medicine & Radiology 36(3):p 227-232, Jul–Sep 2024. | DOI: 10.4103/jiaomr.jiaomr_274_23

13. Sufiawati, Irna, Megawati, Ani, Al Farisyi, Muhammad, Putra, I. Nyoman Gede Juwita, A Case Series of Psychological Stress Evaluation as a Risk Factor for Oral Lichen Planus, Case Reports in Dentistry, 2022, 1915122, 9 pages, 2022. https://doi.org/10.1155/2022/1915122

14. Jose L RM, Jose VB, Juan RM, Javier SD, Maria AM, Yolanda J. Psychologic factors and oral lichen planus. A psychometric evaluation of 100 cases. Oral Surg Oral Med Oral Pathol 1998; 86 : 687-91.

15. Choudhary S. Psychosocial stressors in oral lichen planus. Australian Dental Journal 2004; 49(4):192-195.

16. Michaell A Huber. Oral lichen planus. Quintessence Int 2004; 35:731-752.

17. Hampf BGC, Malmstrom MJ, Aalberg VA, Hannula JA, Vikkula J. Psychiatric disturbance in patients with oral lichen planus. Oral Surg Oral Med Oral Pathol 1987; 63:429-32.

18. Soto-Araya M, Rojas-Alcayaga G, Esguep A. Association between psychological disorders and the presence of oral lichen planus, burning mouth syndrome and recurrent apthous stomatitis. Med Oral 2004; 9:1-7.

19. McCartan BE. Psychological factors associated with oral lichen planus. J Oral Pathol Med 1995; 24:273-75.

20. Lowental U, Pisanti S. Oral lichen planus according to the modern medical model. J Oral Med 1984; 39:224-6.

21. Song, H. J., Kang, K. H., Byun, J. S., & Kim, D. Y. (2026). Oxidative stress and metabolic dysfunction in oral lichen planus pathogenesis. *Animal Cells and Systems*, *30*(1), 353–367. https://doi.org/10.1080/19768354.2026.2648907