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Prevalence of Oral Lichen Planus and Assessment of Factors Associated with It- A Retrospective Study

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Abstract

Lichen planus is a chronic inflammatory mucocutaneous disease that evolves in outbreaks, affecting the skin, mucous membranes or both. It is a recurrent disease. Etiology of lichen planus include anxiety, diabetes, autoimmune diseases, mainly chronic liver disease, intestinal diseases, increased cholesterol, medications, stress, hypertension, infections, contact with dental materials, cancer and a genetic predisposition to cancer. It mainly affects the middle aged and the elderly, with a predominance in females in a ratio of 2:1. The aim of this study was to evaluate the prevalence of Lichen planus assessment of factors associated with it. A retrospective study was conducted in the Saveetha Dental College, Chennai, India. Ethical clearance was obtained from SRB committee, Saveetha Dental College, Chennai, India. The clinical portion of this retrospective study was conducted over a 9 month period,i.e, between June, 2019 to March,2020. Some patients reported with pain while for others it was observed during routine examination. Data was collected from a total of 86000 patients who visited Saveetha dental college between Jun,2019 to March,2020. Out of this, the data of 99 patients who visited the institute were retrieved. The data obtained was tabulated in SPSS for windows, version 20. Descriptive statistics were analysed. Chi square test was done to analyse correlation. Data Analysis in the present study revealed that oral lichen planus was more predominant in females. It was more predominant between 50-59 years of age. The erosive variety of oral lichen planus was more predominant, most commonly affects the buccal mucosa and diabetes was the most predominant systemic disease in these patients. The association was found to be statistically significant between clinical variants of oral lichen planus and age (P=0.000) and gender (P=0.000). However, association was not found to be statistically significant between clinical variants of oral lichen planus and area affected (P=0.146), dental status (P=0.795) and systemic diseases (P=0.602).

Keywords: *Oral lichen planus, reticulate pattern, erosive lichen planus, autoimmune disease, precancerous lesion.*

Introduction

Lichen planus is a chronic inflammatory mucocutaneous disease that evolves in outbreaks, affecting the skin, mucous membranes or both. It is a recurrent disease[1]. Etiology of lichen planus include anxiety, diabetes, autoimmune diseases, mainly chronic liver disease, intestinal diseases, increased cholesterol, medications, stress, hypertension, infections, contact with dental materials, cancer and a genetic predisposition to cancer[2–5]. It mainly affects the middle aged and the elderly, with a predominance in females in a ratio of 2:1[6,7].

The oral lesions in Lichen planus are generally chronic, don't show spontaneous remission and have a tendency to become cancerous[8]. Even though oral lichen planus is often asymptomatic, it sometimes causes symptoms ranging from burning sensations to

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severe pain, which interferes with speaking, eating and swallowing [9–11].

An important differential diagnosis to oral lichen planus is oral leukoplakia[12]. Types of lichen planus are reticular variant, erosive variant, pigmented variant, papular variant, bullous variant, ulcerative variant, annular variant and lichenoid reaction variant. More than one form can be present in the same patient, at the same location[13].

A study by Czerninski et al states that implant placement can be done in patients with lichen planus[14]. The implants do not influence the disease manifestations. However, proper protocol and good surgical techniques need to be followed to achieve primary stability and integrity of implants [15,16]. Excess cements and marginal discrepancies must be avoided [6,7,17–20].

Known aetiologies for oral lichen planus include hepatitis C or chronic liver disease, diabetes, and stress[21]. Associations of oral lichen planus with dental material exposures, particularly dental metals, has been studied by some authors [22,23]. Allergic responses can be tested with a patch test. There is overwhelming evidence that these exogenous and endogenous factors combined with genetic factors, predispose patients to develop this disease [24–26].

The pathogenesis of Lichen planus is poorly understood. But oral lichen planus is of autoimmune origin. The mechanism is said to involve a T-cell mediated response associated with a lymphocyte-epidermal interaction. In this auto cytotoxic CD8+ T cells trigger the apoptosis of epithelial cells. This leads to antigenic alteration of the keratinocytes, which leads to an immunologic reaction. Cytokines which are released by the altered keratinocytes and the remaining associated inflammatory infiltrate, induce adhesion molecule expression. This causes further cytokine and chemokine release, causing a T-cells dominated infiltrate.

In susceptible individuals, the chronic presentation of antigen by keratinocytes and direct cell-mediated damage of the keratinocytes by CD8+ cytotoxic T cells may perpetuate the condition. The immunologic reaction begins with the activation of Langerhans' cells, which present the antigen to the CD4+ lymphocytes. These CD4+ lymphocytes promote epithelial destruction. Continuation of this process can activate CD8+ lymphocytes, leading to the chronic form of the disease [27,28].

Lundstrom et al. suggested that Salivary gland function is affected in some patients with oral lichen planus. He examined 39 patients with oral lichen planus and stated that 87% of patients exhibited low or very low unstimulated salivary rate. However, the pH and the buffering capacity of the saliva were normal[6]. Xerostomia is a subjective sensation of oral dryness, but can also be reported as a burning sensation. Structural salivary gland disorders include Sjogren's syndrome, sarcoidosis, postirradiation damage, developmental anomalies, and diabetes mellitus. The functional causes of xerostomia include chronic anxiety states, dehydration, and drug therapy[29].

The purpose of this study was to evaluate the prevalence of Lichen planus.

Materials and Methods

A retrospective study was conducted in the Saveetha Dental College, Chennai, India. Ethical clearance was obtained from SRB committee, Saveetha Dental College, Chennai, India. The clinical portion of this retrospective study was conducted over a 9 month period,i.e, between June, 2019 to March,2020. Some patients reported with pain while for others it was observed during routine examination.

Inclusion criteria:Patients diagnosed with Lichen planus, both males and females, patients of all ages.

Data was collected from a total of 86000 patients who visited Saveetha dental college between Jun,2019 to March,2020. Out of this, the data of 99 patients who visited the institute and were diagnosed with lichen planus were retrieved. The data obtained was tabulated in SPSS for windows, version 20. Descriptive statistics were analysed. Chi-square test was done to analyse association.

Results and Discussion

In the present study 40.6% were males and 57.4% were females. 13.9% were between 20-29 years, 15.8% were between 30-39 years, 18.8% were between 40-49 years, 32.7% were between 50-59 years, 14.9% were between 60-69 years, 2% were >70 years. 33.7% had reticular variant, 48.5% had erosive variant, 2% had pigmented variant, 8.9% had lichenoid reaction variant, 3% had bullous variant, 1% had ulcerative variant, 1% had annular variant. 77.2% occurred in buccal mucosa, 20.8% occurred in labial mucosa **(Figure 1)**. 26.7%

had diabetes, 17.8% had hypertension, 12.9% had other systemic diseases, 40.6% had no systemic diseases **(Figure 2)**. 24.8% had caries, 31.7% had restorations, 16.8% had crowns, 24.8% were partially edentulous **(Figure 3)(Table 1)**.

The association was found to be statistically significant between clinical variants of oral lichen planus and age (P=0.000) and gender (P=0.000). However, association was not found to be statistically significant between clinical variants of oral lichen planus and area affected (P=0.146), dental status (P=0.795) and systemic diseases (P=0.602).

Table 1 - Frequencies of gender, age, clinical variant, area affected, systemic diseases and dental status.

S.No	Variable	Options	Frequency (%)
1	Gender	Male Female	41 (40.6%) 58 (57.4%)
2	Age	20-29 years 30-39 years 40-49 years 50-59 years 60-69 years >70 years	14 (13.9%) 16 (15.8%) 19 (18.8%) 33 (32.7%) 15 (14.9%) 2 (2.0%)
3	Clinical variant	Reticular Erosive Pigmented Lichenoid reaction Bullous Ulcerative Annular	34 (33.7%) 49 (48.5%) 2 (2%) 9 (8.9%) 3 (3%) 1 (1%) 1 (1%)
4	Area affected	Buccal mucosa Labial mucosa	78 (77.2%) 21 (20.8%)
5	Systemic diseases	Diabetes Hypertension Others No systemic diseases	27 (26.7%) 18 (17.8%) 13 (12.9%) 41 (40.6%)
6	Dental status	Caries Restorations Crowns Partially edentulous Completely edentulous	25 (24.8%) 32 (31.7%) 17 (16.8%) 25 (24.8%) 0 (0%)

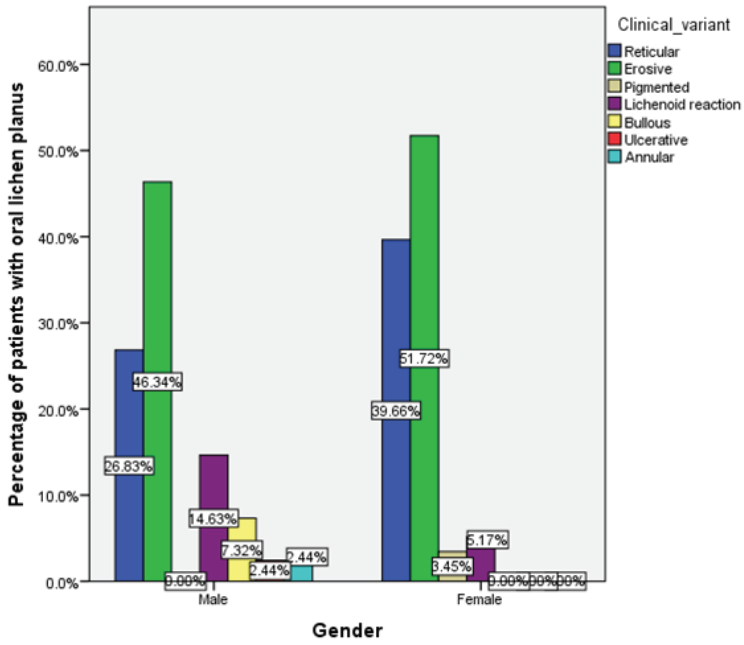

Figure 1 - Bar graph represents the correlation between clinical variants of oral lichen planus and gender. X-axis represents the gender and Y-axis represents the percentage of patients with oral lichen planus. Chi-square test was done and association was found to be statistically significant. (Pearson Chi-square Value:113.389, DF:14, P value:0.000(<0.05) hence statistically significant). There is statistically significant association between gender and clinical variants of lichen planus.

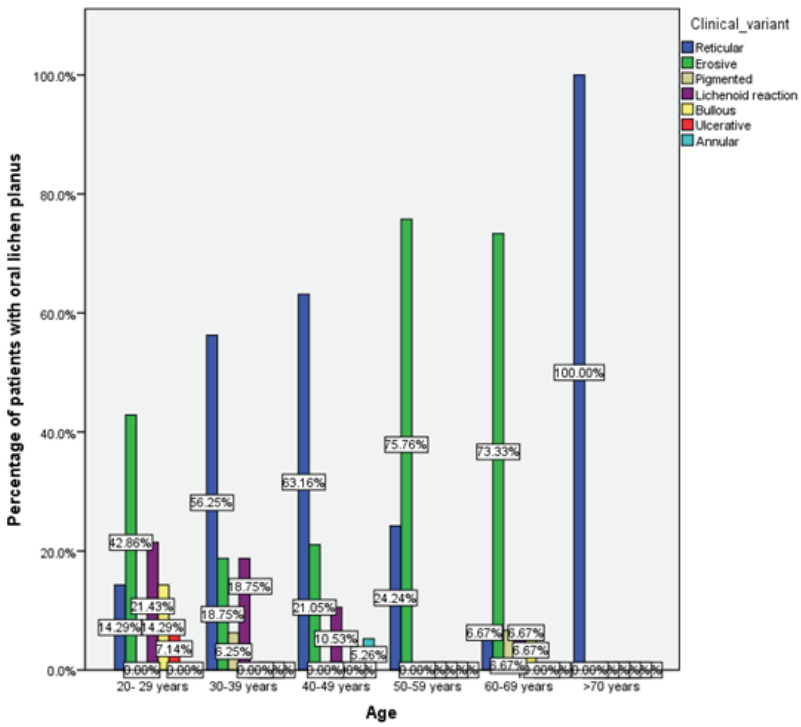

Figure 2 - Bar graph represents the correlation between clinical variants of oral lichen planus and age. X-axis represents the age of the patient and Y-axis represents the percentage of patients with oral lichen planus. Chi-square test was done and association was found to be statistically significant.(Pearson Chi-square P value:0.000(<0.05), hence statistically significant). There is statistically significant association between age and clinical variants of lichen planus.

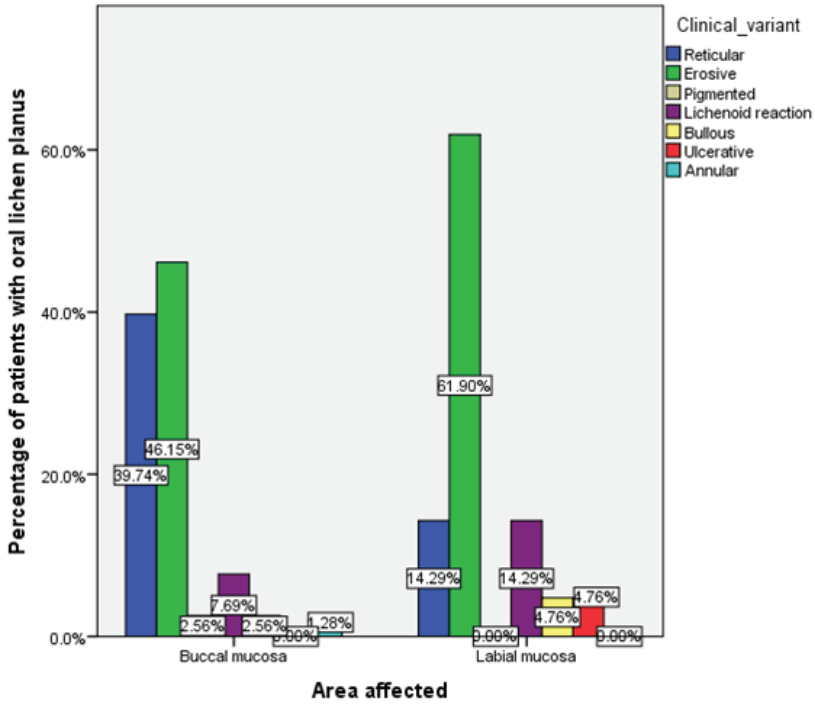

Figure 3 - Bar graph represents the correlation between clinical variants of oral lichen planus and area affected. X-axis represents the area affected in the patient's mouth and Y-axis represents the percentage of patients with oral lichen planus. Chi-square test was done and association was not found to be statistically significant. (Pearson Chi-square P value:0.146(>0.05), hence not statistically significant). There is no statistically significant association between area affected and clinical variants of oral lichen planus.

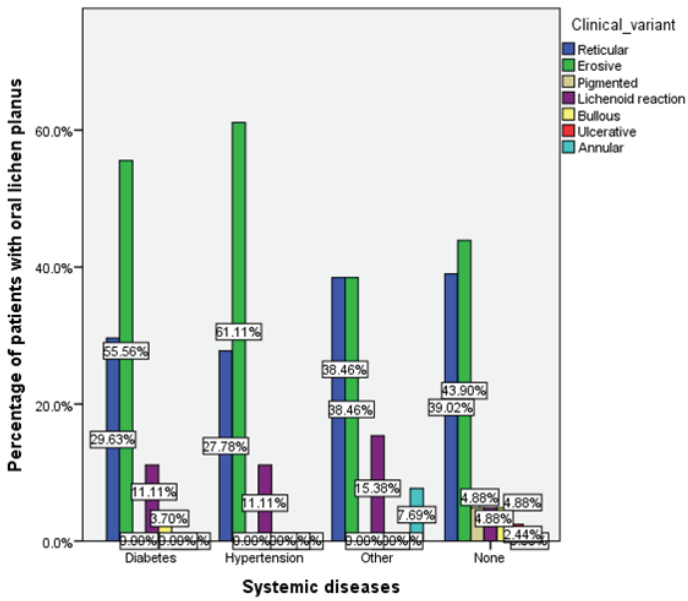

Figure 4 - Bar graph represents the correlation between clinical variants of oral lichen planus and systemic diseases that the patient has. X-axis represents the systemic diseases that the patient has and Y-axis represents the percentage of patients with oral lichen planus. Chi-square test was done and association was not found to be statistically significant.(Pearson Chi-square P value:0.602(>0.05), hence not statistically significant). There is no significant association between systemic diseases and clinical variants of oral lichen planus.

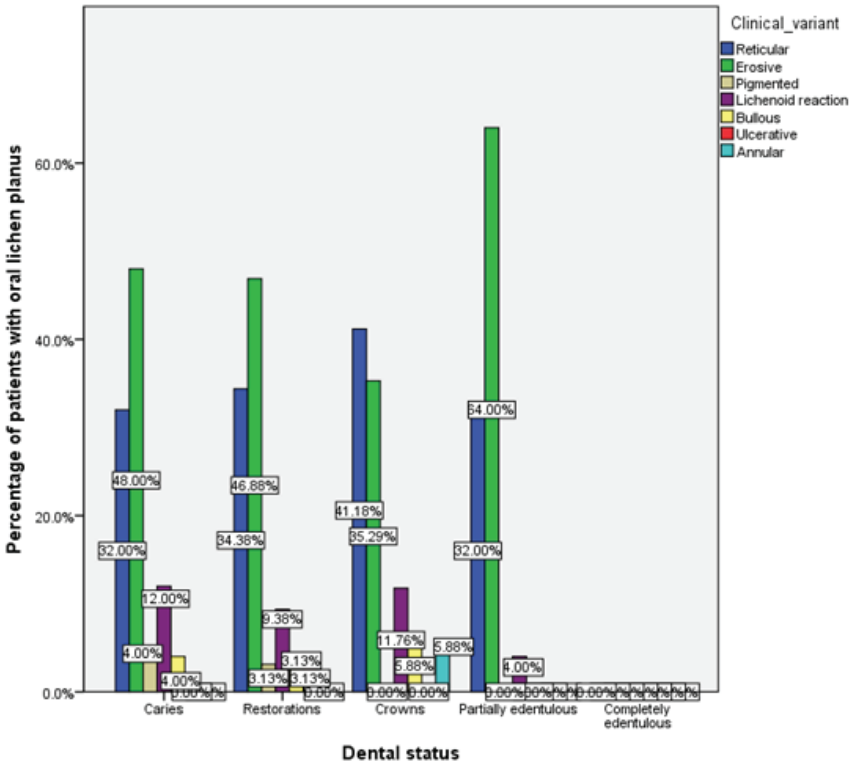

Figure 5 - Bar graph represents the correlation between clinical variants of oral lichen planus and dental status of the patient. X-axis represents the dental status of the patient and Y-axis represents the percentage of patients with oral lichen planus. Chi-square test was done and association was not found to be statistically significant.(Pearson Chi-square P value: 0.795(>0.05), hence not statistically significant). There is no statistically significant association between dental status and clinical variants of oral lichen planus.

Oral Lichen planus was more predominant in females in the present study. There was also significant correlation between the clinical variants of oral lichen planus and gender (P=.000). This was in accordance with Martin et al, Axel et al,, Colquhoun ae al, Karbach et al, Varghese et al and Mankapure et al who stated that lichen planus was more predominant in females [22,29–33]. Eisen et al stated that even though oral lichen planus was more prevalent in women, it developed at an earlier age in men [34,35]. However, Pindborg et al reported an absence of sex predominance[34]. Munde et al reported a male: female ratio of 1.61:1[36]. Bandyopadhyay et al also reported a male predominance[37].

In the present study, Oral lichen planus was more predominant between 50-59 years of age. There was also significant correlation between the clinical variants of oral lichen planus and gender (P=.000). This concurs with Gumru et al who stated that a patient's mean age was approximately 50 years[38]. Axell and Pindborg et al also stated that maximum cases were documented in patients between 55-64 years of age [30,34]. Karbach et al also stated that peak incidence of oral lichen planus occurred in the fifth decade of life[31]. However, Colquhoun et al stated that the overall median ages of men and women were 67 and 66 years old, respectively[29]. Mankapure et al stated that the mean age of oral lichen planus patients was 45.4 years[33]. Bandyopadhyay et al stated a predominance in the third decade[37].

The erosive variety of oral lichen planus was more predominant in the present study. This concurs with Gumru et al who stated that red forms were the most frequent, affecting 60.5% of patients[38]. Eisen et al also stated that the erosive form was most prevalent[35]. Axell et al, Munde et al,Varghese et al, Bandyopadhyay et al and Mankapure et al stated that the reticular type was more predominant [30,32,33,36,37].

In the present study, oral lichen planus most commonly affects the buccal mucosa. This concurs with Martin et al, Axell et al, Munde et al, Mankapure et al,

Varghese et al, Bandyopadhyay et al, Pindborg et al, and Eisen et al who stated that oral lichen planus commonly affects buccal mucosa [22,30,32–37].However, there was no significant correlation between the clinical variants of oral lichen planus and area affected (P=.146).

The incidence of systemic diseases in the present study included diabetes at 26.7%, hypertension at 17.8%, other systemic diseases like asthma, arthritis, gastric disorders at 12.9% and 40.6% had no systemic diseases. However, Munde et al stated that the incidence of systemic diseases included hypertension (11%), diabetes mellitus (2.4%), and hypothyroidism (0.78%)[36]. Varghese et al stated that hypersensitivity reaction was frequently associated with systemic illness with oral lichen planus[32]. However, there was no significant correlation between the clinical variants of oral lichen planus and systemic diseases (P=.602).

In the present study, 31.7% of the population had restorations. However, there was no significant correlation between the clinical variants of oral lichen planus and dental status (P=.795). Gumru et al stated that dentures were one of the precipitating factors for oral lichen planus[38]. Martin et al reported a significant correlation between oral lichen planus and gold and amalgam restorations[22]. Lunstrom stated that clinical signs of corrosion were significantly more frequent in the OLP group (72%) than in the control cases (28%). Patients with atrophic-erosive OLP exhibited a significantly higher frequency of corrosion (83%) than those with reticular type (46%)[6].

The limitations of this study include small sample size, sample size taken from similar geographical location and the psychological,socioeconomic status and hormonal status of the patients were not assessed. Since this was a retrospective study, the prognosis of the patient was not analysed. Further analytical studies must be done in the future to overcome these limitations.

Conclusion

The present study was conducted to understand the prevalence of oral lichen planus and assessment of factors associated with it. Within the limitations of this study, it can be concluded that oral lichen planus was more predominant in females, between 50-59 years of age. Clinically, the erosive variety of oral lichen planus was more prevalent with the most commonly affected area being the buccal mucosa and diabetes was the most predominant systemic disease in these patients. The association was found to be statistically significant between clinical variants of oral lichen planus and age and gender. However, association was not found to be statistically significant between clinical variants of oral lichen planus and area affected, dental status and systemic diseases.

Author Contributions

The primary author contributed to establish the materials and methods and analysing the results followed by manuscript writing.

The co-author verified the results and manuscript before submission.

Conflict of Interest : There are no conflicts of interest.

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Ethical Clearance: It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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