

# ORIGINAL PAPERS

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NARENDRA PARKASH RAI<sup>1, A, B, E, F</sup>, PRAFFUL KUMAR<sup>2, C, D, F</sup>, SHABIL M. MUSTAFA<sup>3, A, B, E, F</sup>,  
DARSHAN D. DIVAKAR<sup>4, C-F</sup>, ABDULAZIZ AL KHERAIF<sup>4, C-F</sup>, RAVIKUMAR  
RAMAKRISHNAIAH<sup>4, C-G</sup>, SAJITH VELLAPALLY<sup>4, C-F</sup>, M.H.N. DALATI<sup>5, C-F</sup>,  
NARASHIMHA REDDY PARINE<sup>6, C-F</sup>, SUKUMARAN ANIL<sup>7, C-F</sup>

## Relation Between Periodontal Status and Pre-Cancerous Condition (Oral Lichen Planus): A Pilot Study

<sup>1</sup> Department of Oral Medicine and Radiology, Lincoln University College, Kuala Lumpur, Malaysia

<sup>2</sup> Department of Orthodontics, KVG Dental College & Hospital, Sullia, Karnataka, India

<sup>3</sup> Department of Oral Medicine & Radiology, Malabar Dental College and Research Centre, Manoor, Malappuram, Kerala, India

<sup>4</sup> Dental Biomaterials Research Chair, Dental Health Department, College of Applied Medical Sciences, King Saud University, Kingdom of Saudi Arabia

<sup>5</sup> Consultant Orthodontist and Restorative Dentist, Springs Dental Care, New Road Side, Horsforth, Leeds, UK

<sup>6</sup> Genome Research Chair, Department of Biochemistry, College of Science, King Saud University, Riyadh, Kingdom of Saudi Arabia

<sup>7</sup> Department of Preventive Dental Sciences, College of Dentistry, Prince Sattam Bin Abdulaziz University, Al-Kharj, Kingdom of Saudi Arabia

**A** – research concept and design; **B** – collection and/or assembly of data; **C** – data analysis and interpretation; **D** – writing the article; **E** – critical revision of the article; **F** – final approval of article; **G** – other

### Abstract

**Background.** Oral lichen planus (OLP) is a common chronic mucocutaneous disease mostly seen in middle aged and elderly females. Oral lichen planus can occur in different oral sites such as gingiva, labial, buccal mucosa and on the tongue. And can have an indirect effect on initiating periodontitis.

**Objectives.** The purpose of the study was to evaluate the periodontal status of OLP patients and compare it with that of healthy controls. The presence of erosive lesions among gingival tissues makes oral hygiene procedures difficult to perform for obvious reasons. Plaque control and rigorous oral hygiene are primary requisites for the treatment of any oro-mucosal disease.

**Material and Methods.** Thirty patients with the erosive and reticular form of OLP as a study group and 30 healthy subjects as a control group were selected. The periodontal status of all subjects including gingival index (GI), Russell's periodontal index (PI) and bleeding on probing (BOP) were evaluated in both groups. Finally, the data was analyzed by a paired t-test using SPSS software v. 22.

**Results.** The mean values of GI, PI and BOP were observed to be higher in the study group compared to the control group, and this was statistically significant ( $p < 0.05$ ). The results shown are suggestive that periodontal status was poor in the study group as compared to the control group.

**Conclusions.** Further studies need to investigate periodontal status in oral lichen planus patients with larger sample size, and careful follow-up of these will assure an increase in the quality of life of these patients. The patient should be informed regarding the risk of periodontal problems in OLP and should be advised to have regular dental checkups to avoid a worsening of the condition (*Adv Clin Exp Med* 2016, 25, 4, 763–766).

**Key words:** gingivitis, oral lichen planus, periodontitis, pre-cancerous condition.

Periodontal diseases are the most prevalent oral microbial infections which affect the supporting tissues of the teeth. The etiopathogenesis of periodontal disease is multifactorial and recent advances in the scientific field have led to a better interpretation of the disease process.

Oral lichen planus is a chronic immunologic inflammatory disorder with diverse clinical presentations that includes papular, reticular, plaque type, erythematous, bullous and ulcerative lesions. The latter three forms constitute the symptomatic variants. Despite various pharmacological advances, medical management of oral lichen planus still seems to be a herculean task. This can be attributed to the fact that the etiopathogenesis of this disease still remains unclear. Immune dysregulation plays a prime role in the evolution of lichen planus. Recent data suggests the significance of autoreactive T lymphocytes in the progression of the disease.

An international workshop for the classification of periodontal disease organized by the American Academy of Periodontology categorizes lichen planus as a gingival manifestation of systemic conditions under non-plaque induced gingival lesions. All subtypes of lichen planus has been reported on gingival tissues. In certain subjects, oral lichen planus lesions are restricted to gingiva alone. The erythematous type of oral lichen planus presents on gingiva as desquamative gingivitis. This puts the clinicians at a diagnostic disadvantage as this form of oral lichen planus manifests without Wickham's striae.

It is suggested that gingival lesions in oral lichen planus can indirectly increase the risk of plaque-induced periodontal disease when symptoms associated with such lesions impede the maintenance of proper oral hygiene and can enhance the risk of periodontal tissue destruction. Erosive areas in the oral cavity make oral hygiene procedures difficult to perform. After buccal mucosa (Fig. 1) and the tongue, gingiva is the next most common site involved, with a reported involvement of 8.6–10% [1]. Its chronic nature, symmetric appearance and multiple area involvements are a few of the characteristic features of OLP. The gingival involvement of OLP is characterized by erythema, erosions, and ulcerations, which are mainly located on the attached gingiva (Fig. 2). The aim of the present study was to evaluate the periodontal status of patients with oral lichen planus and compare it to that of healthy controls.

## Material and Methods

Sixty subjects between 30–60 years old who had visited the oral diagnosis department were selected. 30 patients who were diagnosed with the erosive



Fig. 1. Oral lichen planus on left buccal mucosa



Fig. 2. Gingival involvement of OLP

and reticular form of oral lichen planus were in the study group (group A) and 30 healthy people who were put in the control group (group B) were enrolled in the study. The diagnosis of gingival OLP was made by clinical diagnosis and confirmed by histological examination. OLP lesions were present on the buccal mucosa, tongue and gingival areas in the study group. The patient's general state of dentition was fine with a few cases of stains and dental caries. Some patients underwent extraction of a tooth due to dental caries but they were not using any kind of removable or fixed prosthesis. Exclusion criteria for the study were a history of previous and/or current plaque-related periodontal therapy, any other systemic disorders like CVS, hypertension and pregnancy, the presence of histologic signs of dysplasia, drug-induced lichenoid reaction and the presence of amalgam fillings near the lesions. Informed consent was taken from each participant before enrolling in the study. Ethics committee permission was obtained before starting the study.

All the patients were subjected to clinical periodontal examination, based on Gingival Index

(GI), Russell’s Periodontal Index (PI) and Bleeding On Probing (BOP). The periodontal examination included an evaluation of the periodontal condition using William’s periodontal probe. Gingival index was assessed on the selected surface of selected teeth. The selected teeth were 16, 12, 24, 36, 32, and 44. The tissue surrounding each tooth was divided into 4 units: distofacial papilla, facial margin, mesiofacial papilla and entire lingual gingival area. A blunt instrument is used to assess the bleeding potential (BOP) of tissues. Periodontal index was assessed by examining all the teeth present based on Russell’s periodontal index. All the gingival tissue circumscribing each tooth was assessed for gingival inflammation and periodontal involvement. Descriptive data was collected and the mean and standard deviation for all the variables were calculated. The data was analyzed using SPSS software version 22 and a paired t-test was used to compare the differences between the two groups. A P-value  $\leq 0.05$  was considered to be statistically significant.

## Results

The study included 60 patients who were grouped as controls (30) and OLP (30) amongst them. The mean and standard deviation for both the groups were calculated using a paired t-test and the result showed a high significance ( $p = 0.0001$ ). The mean age for the study (OLP) group was 47.7 years and that of the control group was 45.2 years. There was no significant difference between the two age groups. Out of 60 patients, in the study (OLP) group, 20 patients were female and 10 patients were male whereas in the control group 19 patients were female and 11 patients were male. Periodontal conditions were found to be worse in the study group as compared to the control group. The mean and standard deviation for GI, PI and BOP were calculated and for the study group it was found to be (GI  $4.66 \pm 0.76$ , PI  $2.56 \pm 0.60$  and BOP  $14.3 \pm 7.34$ ) and that of the control group was (GI  $1.78 \pm 0.57$ , PI  $1.15 \pm 0.41$  and BOP  $3.04 \pm 0.68$ ). The values were similar for all the patients and no

variation in the results were noted when compared to the controls, irrespective of the gender of the patient and location of the lesion. The mean values and standard deviation of the periodontal parameters are shown in Table 1.

## Discussion

Our results showed that the periodontal status was poor in the study group as compared to the control group. Patients suffering from oral lichen planus are not capable of performing oral hygiene procedures efficiently, hence there will be increased gingival inflammation and periodontal problems. The erosive form of lichen planus is generally persistent and painful to patients so they are unable to maintain oral hygiene procedures regularly, which leads to plaque and calculus deposition, which can exaggerate the condition and increase the possibility of long-term periodontal disease [2].

Usually, lichen planus cases are asymptomatic, but treatment is often provided in patients with symptomatic cases. Very often patients with erosive lichen planus present with significant management problems. Histopathologically, OLP should be differentiated from mucous-membranous pemphigoid, pemphigus vulgaris and linear IgA disease [3]. To alleviate the condition, avoidance of potential precipitating drugs, tobacco, alcohol and local trauma, as well as strict oral hygiene practices to maintain proper oral hygiene, are essential [4].

Arduino et al. showed a difference in oral hygiene when comparing worsened mucous membrane pemphigoid (MMP) patients with desquamative gingivitis to healthy controls [5]. Other studies in the literature about periodontal parameters in mucous membrane pemphigoid and pemphigus vulgaris with desquamative gingivitis, such as Arduino et al., Schellinck et al. [6], and Akman et al. [7], found no correlation between desquamative gingivitis (DG) and periodontal status [8]. Schellinck et al. and Tricomo et al. demonstrated that patients with MMP exhibited a statistically significantly higher gingival index and amount of lingual gingival recession when compared to controls but they did not appear to be at risk in the development of periodontal disease [6, 9]. In another study, conducted by Lopez-Jornet P, they measured the Gingival Index, Plaque Index, and Community Periodontal Index of Treatment Needs (CPITN). The author found mean CPITN scores were significantly higher in oral lichen planus patients ( $2.8 \pm 0.7$ ) than in the healthy controls ( $1.1 \pm 0.8$ ) but were non-significant according to the extent of the lesions or their clinical form of presentation [10].

**Table 1.** Mean values and SD of periodontal parameters (GI, PI and BOP) in each group

	GI $\pm$ SD	PI $\pm$ SD	BOP $\pm$ SD
Study group	$4.66 \pm 0.50$	$2.56 \pm 0.55$	$14.3 \pm 7.34$
Control group	$1.78 \pm 0.51$	$1.15 \pm 0.41$	$3.04 \pm 0.68$

\* p-value = 0.0001.

Oral lichen planus solely may not be responsible for the worsening of the condition but the accumulation of plaque and calculus due to improper oral hygiene makes it worse in cases with OLP. Primary consideration in the treatment of the condition should be control of the accumulation of plaque and calculus and improvement in the oral hygiene procedures of the patients, which will lead to healing of the lesion and could alleviate the condition [11]. Erosive and ulcerative areas may complicate oral hygiene procedures like tooth brushing as it could lead to severe pain, discomfort and gingival bleeding. Again, due to improper oral hygiene, the situation may lead to a worsening of the condition and adversely affect the course and outcome of OLP [12]. Oral hygiene

procedures followed by patients should be effective and efficient but gentle, because continuous and effective oral hygiene procedures may lead to healing of the condition. To some extent, OLP lesions can be improved by maintenance of proper oral hygiene, plaque control and periodontal treatment [13–15].

Further studies are needed to investigate periodontal status in oral lichen planus patients with larger sample size. Careful follow-up of these will assure an increase in the quality of life of these patients. The patient should be informed regarding the risk of periodontal problems in OLP and should be advised to have regular dental checkups to avoid a worsening of the condition.

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## Address for correspondence:

Darshan Devang Divakar  
Dental Biomaterials Research Chair  
College of Applied Medical Sciences  
P. O. Box 10219  
King Saud University  
Riyadh 11433  
Kingdom of Saudi Arabia  
E-mail: darshandevang@gmail.com  
Tel.: 96 653 803 82 91

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