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RESEARCH ARTICLE

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ASSESSMENT OF VITAMIN D SERUM LEVELS IN PATIENTS WITH ORAL LICHEN PLANUS

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ABSTRACT

Background: This study was conducted to compare Vitamin D Serum Levels in Patients with Oral Lichen Planus and Healthy Subjects. **Material and methods:** There were 20 subjects included in the study, diagnosed with Oral Lichen Planus and 20 subjects without the condition. Vitamin D serum levels was measured in both Oral Lichen Planus subjects and healthy controls after collecting 5 mL of blood from each group and analysing it with a vitamin D total (25-hydroxy vitamin D) kit using the electrochemiluminescence technique. Patient consent form were taken and recorded. The independent samples t-test or its non-parametric alternative was used to examine the data in SPSS 17. The cutoff for statistical significance is $p < 0.05$. **Results:** 20 subjects were evaluated in the control group, consisting of 16 females (80%) and 4 males (20%) subjects. In the OLP group, 20 patients were evaluated, consisting of 15 females (75%) and 5 males (25%) subjects. Differences in vitamin D levels between the OLP and control groups were larger in the healthy subjects, with a mean difference of 6.4 units (ng/mL) between the two groups, but statistically using an independent t-test no significant differences were found between the two groups because of the homogeneity of variances in the two groups as verified by the Levene's test. **Conclusion:** Serum vitamin D levels in those with oral lichen planus were not significantly different from those in healthy people.

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INTRODUCTION

The clinical understanding of lichen planus (LP) is commonly attributed to Ferdinand Ritter von Hebra, who coined the term "lichen ruber planus" in 1860. Further refinement of its clinical definition occurred through the works of Moritz Kaposi and Erasmus Wilson. Wilson, in 1866, provided the first published description of oral lichen planus (OLP), detailing a white papular eruption affecting the tongue, buccal, and mandibular labial mucosa in a 56-year-old female¹. Lichen planus is an immune-mediated inflammatory condition characterized by distinctive lesions on the skin and mucous membranes. It affects approximately 5% of the general adult population, with a higher incidence among females (2:1) and most commonly manifests in middle age^{1,2}. Up to 77% of patients with lichen planus experience oral involvement, with the buccal mucosa being the most frequently affected site. While oral lesions may be asymptomatic in some cases, others may experience discomfort and difficulty tolerating certain foods, such as acidic or spicy items, as well as toothpaste³. Despite being a benign disorder, approximately 1.4% of oral cavity lesions associated with lichen planus undergo malignant transformation within 7 years.

Risk factors for this transformation include ulceration, lesions located on the tongue, and female gender³. Vitamin D plays a significant role in oral homeostasis due to its potent anti-inflammatory and immunomodulatory effects. Its impact on various oral diseases, including recurrent aphthous stomatitis (RAS), Behçet's syndrome, PFAPA syndrome (periodic fever, aphthous stomatitis, pharyngitis, and adenitis), Sjögren's disease (SD), periodontitis, and oral squamous cell carcinoma (OSCC)⁴, has been extensively studied. Hence, this study aimed to compare serum levels of Vitamin D in patients with oral lichen planus and healthy subjects.

MATERIAL AND METHODS

The current study enrolled 20 participants diagnosed with Oral Lichen Planus and 20 subjects without the condition. Patient consent forms were obtained and recorded prior to participation. Vitamin D serum levels were assessed in both groups by collecting 5 mL of blood and analyzing it using a vitamin D total (25-hydroxy vitamin D) kit employing the electrochemiluminescence technique. Statistical analysis was conducted using the independent samples t-test or its

non-parametric alternative in SPSS 17. The cutoff for statistical significance was set at $p < 0.05$.

RESULTS

Table 1. Gender-wise distribution of subjects in both groups

Groups	Number of males	Number of females
Control group	04	16
OLP group	05	15

In the control group, 20 subjects were assessed, comprising 16 females (80%) and 4 males (20%). Meanwhile, the OLP group comprised 20 patients, with 15 females (75%) and 5 males (25%). The mean serum vitamin D level in patients with oral lichen planus was 28.74 ± 10.31 ng/mL, while in healthy subjects, it was 35.45 ± 14.36 ng/mL. The difference in vitamin D levels between the OLP and control groups was more pronounced in healthy subjects, with a mean difference of 6.71 units (ng/mL) between the two groups. An independent t-test was conducted to compare vitamin D serum levels between healthy individuals and OLP patients. The analysis did not reveal any significant differences ($p = 0.346$) between the two groups, attributable to the homogeneity of variances in both groups, as confirmed by Levene's test.

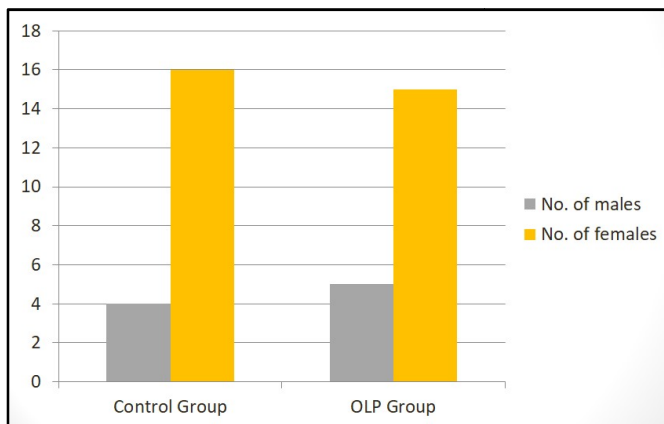


Figure 1. Gender-wise distribution of subjects in both groups

DISCUSSION

Vitamin D is believed to influence the development and severity of symptomatic forms of OLP by regulating immune system function². Active forms of vitamin D play a regulatory role in gene expression and have been linked to various autoimmune and malignant diseases. Vitamin D deficiency has been associated with decreased levels of Th2 cells, particularly impacting inflammatory pathways such as Th1 and Th17, leading to significant inflammation in immune-mediated diseases like OLP⁵. Hence, investigating serum vitamin D levels, especially in chronic inflammatory autoimmune conditions like OLP, is crucial. To address this, our study aimed to compare serum vitamin D levels in patients with Oral Lichen Planus (OLP) and healthy subjects. In the control group, consisting of 20 subjects, 16 were females (80%) and 4 were males (20%). Meanwhile, the OLP group comprised 20 patients, with 15 females (75%) and 5 males (25%). Interestingly, differences in vitamin D levels between the OLP and control groups were more prominent in healthy subjects, with a mean difference of 6.71 units (ng/mL) observed between the two groups, but there was no significant difference between the groups.

Comparison of vitamin D serum levels between healthy individuals and those with OLP (oral lichen planus) was conducted using an independent t-test. The analysis revealed no significant differences between the two groups, which could be attributed to the homogeneity of variances as confirmed by Levene's test. In a study by Družijanić et al.⁶, involving 68 participants (34 OLP patients and 34 healthy controls), fasting venous blood samples were collected to assess serum vitamin D concentrations. Their findings showed a statistically significant lower serum vitamin D concentration in OLP patients compared to the control group ($p = 0.001$). Particularly, patients with the erosive form of OLP exhibited significantly lower serum vitamin D levels. Additionally, all five patients who developed oral cancer from erosive OLP had low serum vitamin D concentrations. Similarly, Bahramian et al.⁷ aimed to compare vitamin D serum levels in OLP patients and healthy subjects. Their study also found no significant difference in vitamin D serum levels between OLP patients and healthy individuals. The role of vitamin D in OLP pathogenesis and severity is crucial due to its regulatory effects on the human immune system. Future studies with larger sample sizes are recommended to evaluate serum vitamin D levels in various forms of OLP and their association with autoimmune disease severity⁷.

CONCLUSION

Oral Lichen Planus (OLP) represents a prevalent type of oral mucosal lesions with various predisposing factors and systemic associations, yet its exact cause remains poorly understood. In our study, we found that serum vitamin D levels in individuals with OLP-related oral mucosal lesions did not show significant differences compared to those observed in healthy individuals.

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