

## CASE REPORT

# Management of Oral Lichen Planus with Vitamin D: A Case Report

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### ABSTRACT

**Aim:** The aim of the article was to assess the efficacy of vitamin D supplementation in the treatment of oral lichen planus.

**Background:** Oral lichen planus is a chronic inflammatory disease that is characterized by cytotoxic T-cell-mediated damage of the basal cells of the epithelium. Studies have shown that deficiency of vitamin D can be involved in the pathogenesis of lichen planus. Vitamin D has immunosuppressive and immunomodulatory effects, hence is also capable of modulating innate and adaptive immune responses. **Case description:** A female patient aged 45 years complained of burning sensation of mouth for 3 months. Intraoral examination revealed mixed red and white lesions on the left and right buccal mucosae with diffuse erythematous areas. Her serum vitamin D levels revealed a value of 11.12 ng/mL following which we started her on vitamin D supplementation, and after 2 weeks of follow-up, there are no erosive lesions on the buccal mucosae.

**Conclusion:** Vitamin D plays an important role in the remission of symptoms with marked improvement in the resolution of the lesions after restoration to normal levels. Hence, it is suggested that vitamin D has a significant role in the pathogenesis of oral lichen planus like other autoimmune diseases, and supplementing vitamin D can resolve lichen planus to an extent. **Clinical significance:** The role of vitamin D in the pathogenesis and management of oral lichen planus has been established.

**Keywords:** Autoimmune disorder, Oral lichen planus, Vitamin D.

*Journal of Contemporary Dentistry* (2021): 10.5005/jp-journals-10031-1308

### INTRODUCTION

Oral lichen planus is a chronic inflammatory disease that is characterized by cytotoxic T-cell-mediated damage of the basal cells of the epithelium and chronic inflammation.<sup>1</sup> According to reports, 1.1% of oral lichen planus cases undergo malignant transformation and this condition is been characterized under "potentially malignant disorders" by the World Health Organization. An increase in the incidence of oral lichen planus in postmenopausal women has been reported widely. But, the aetiology of the disease is not yet well understood.<sup>2,3</sup>

Vitamin D is said to play an important role in the immune system. The role of vitamin D as an immunosuppressive and immunomodulatory agent is well established. Vitamin D regulates the production of inflammatory cytokines and from activated T and B lymphocytes and thus development of autoimmune diseases.<sup>4</sup> Osteoporosis has been found to be a complication of vitamin D deficiency, especially in postmenopausal women.

There are sufficient documented studies that relate autoimmune diseases such as insulin diabetes mellitus, multiple sclerosis, systemic lupus erythematosus, and rheumatoid arthritis. But its role in oral lichen planus is yet to be established. There seems to be a definite correlation between the incidence of vitamin D-induced osteoporosis and oral lichen planus in postmenopausal women. In this context, a case of oral lichen planus is presented here in a patient who reported to the outpatient department of our dental college and hospital in Navi Mumbai who was treated with vitamin D.<sup>1</sup>

### CASE REPORT

A female patient aged 45 years reported to the Department of Oral Medicine and Maxillofacial Radiology, complaining of a

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**How to cite this article:** Verma SN, Das D. Management of Oral Lichen Planus with Vitamin D: A Case Report. *J Contemp Dent* 2021;x(x):xx-xx.

**Source of support:** Nil

**Conflict of interest:** None

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continuous burning sensation in the mouth for 3 months. She also complained of inability to have even minimally spicy food. She gave a history of menopause 4–5 years back and being under stress for the last 6 months. The patient had visited a local Ayurvedic practitioner 1 month back and was prescribed a mouth gel, a topical corticosteroid, (Deflazacort ointment) which she applied for 15 days, but the burning sensation persisted. The Visual Analogue Scale (VAS) was found to be 10 when she reported to us.

Intraoral examination revealed mixed red and white lesions on both left and right buccal mucosae, extending approximately 4 × 4 cm in size on the left buccal mucosa and 3 × 2 cm in size on the right buccal mucosa. We observed diffuse erythematous areas enclosed with pale white lesions with a periphery formed by linear keratotic white papules extending throughout the right and left buccal mucosae, suggestive of erosive lichen planus

(Figs 1 and 2). The lesions on the right buccal mucosa were intermixed with brownish pigmentation suggestive of areas of healed lichen planus. The gingiva was normal in color, contour, and size; there was no sign of Desquamative gingivitis. Clinical diagnosis of erosive lichen planus was made and a biopsy was avoided due to severe burning sensation in the mouth. Patient's hematological investigation revealed a hemoglobin level of 12.5 g/dL and serum vitamin D levels was 11.12 ng/mL.

Hence, the patient was advised to take capsules of 60,000 IU of vitamin D with a dosage of one capsule per week for 3 months. The patient was asked to report after 2 weeks when we found that she was relieved of the burning sensation and there were no erosive lesions on the buccal mucosae (Figs 3 and 4). She also said she was able to tolerate spicy food. She was followed up after 1 month when the buccal mucosae appeared to be perfectly normal with no sign of any lesion (Figs 5 and 6). She was completely relieved of the burning sensation after a month. Her serum vitamin D also increased to normal levels. She had been followed up every



**Fig. 1:** Right buccal mucosae with erosive and annular pattern of oral lichen planus



**Fig. 2:** Left buccal mucosae with erosive and annular pattern of oral lichen planus



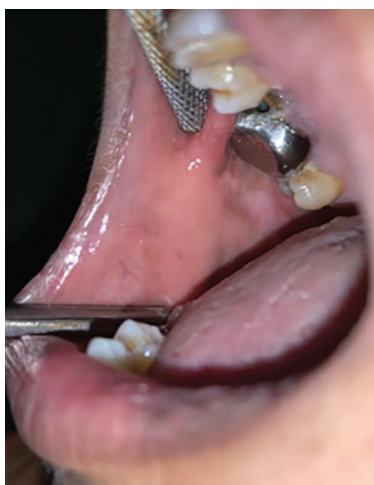
**Fig. 3:** Right buccal mucosae after 2 weeks of treatment with vitamin D



**Fig. 4:** Left buccal mucosae after 2 weeks of treatment with vitamin D



**Fig. 5:** Right buccal mucosae after 1 month of treatment showing no lesions



**Fig. 6:** Left buccal mucosae after 1 month of treatment showing no lesions

month for the last 3 months without any recurrence of any lesion or burning sensation.

## DISCUSSION

Oral lichen planus is the mucosal analogue of lichen planus of skin, although the two demonstrate marked clinical variability. Oral lichen planus exhibits a more persistent course, propensity for malignant alterations with seldom undergoing self-remission.<sup>5</sup> The clinical presentation of various types of oral lichen planus is reticular, atrophic, papular, bullous, plaque, and erosive types.

The etiopathogenesis of oral lichen planus has been attributed to cell-mediated immunity with CD8 + cytotoxic T cells playing a major role. These cells get activated by an unknown antigen or an exogenous peptide and undergo clonal expansion. Due to the interactions between keratinocytes and activated lymphocytes, interleukin (IL)-2, IL-4, IL-10, interferon gamma, and tumor necrosis factor- $\alpha$  are segregated resulting in the migration of inflammatory cells to affected areas. Interferon gamma causes the expression of ICAM-1 by basal keratinocytes along with Langerhans cells and dendritic cells causing the expression of lymphocyte function-associated antigen (LFA)-1 on the surface of lymphocytes. Activated T lymphocytes subsequently trigger apoptosis or direct injury to keratinocytes.<sup>6</sup>

Management of oral lichen planus in the reported literature includes topical application of corticosteroids, retinoids with or without the combination of other immunomodulators, cyclosporine, dapsone, hydroxychloroquine, mycophenolate mofetil, thalidomide and enoxaparin, laser therapy, photodynamic therapy, relaxation therapy. None of these have been reported to be completely curative because of their recalcitrant nature and also their idiopathic aetiology.<sup>6,7</sup> The need of the hour is to develop and explore newer treatment modalities for oral lichen planus with minimum side effects. In this context, we came across a treatment modality by using vitamin D which proved successful in relieving the signs and symptoms of oral lichen planus as presented in this case report.

Beena Varma et al. reported the incidence of vitamin D deficiency in oral lichen planus and the improvement of signs with vitamin D supplementation which led the authors to formulate the hypothesis connecting lichen planus and vitamin D deficiency.

A considerable number of *in vitro* and *in vivo* studies indicate that the most active metabolite of Vit-D1, 25-dihydroxycholecalciferol, or calcitriol has antiproliferative, proapoptotic, prodifferentiating, and antiangiogenic properties.<sup>8</sup> Calcitriol along with cytotoxic agents has synergistic effects.<sup>8</sup>

Postmenopausal estrogen deficiency causes bone loss in the long bones and vertebrae.<sup>9</sup> Gholizadeh et al. showed that the expression of estrogen and progesterone receptors was very low in the oral mucosa of healthy individuals and oral lichen planus patients. Low levels of sex hormones and low levels of receptors in menopause in oral lichen planus patients exacerbate the effects of these hormones on the immune system. This also indicates the more pronounced role of receptors on the surface of immune cells than mucosal cells in the pathogenesis of the disease. The maladaptive receptor hormone feedback system in oral lichen planus patients is also involved in the incidence and exacerbation of the disease by different mechanisms.<sup>10</sup>

Alroy et al. in an *in vitro* study showed the suppression of T-lymphocyte proliferation by 1, 25(OH)2D3 due to which there is a decrease in IL-2, gamma interferon, and granulocyte-macrophage colony-stimulating factor mRNA levels.<sup>11</sup> Another study concluded that 1, 25(OH)2D3 plays an inflammatory role in oral lichen planus as it has an effect on the NF- $\kappa$ B signaling pathway.<sup>12</sup>

Therefore, from the case reported and supporting literature, we can conclude that low vitamin D levels play a crucial role in causing oral lichen planus. It is evident from our case report that vitamin D supplementation can help in treating oral lichen planus.

## LIMITATIONS

A single case report is inadequate to confirm the efficacy of vitamin D in the management of erosive lichen planus. Hence, an extensive study with a larger sample including different types of lichen planus will only establish vitamin D as a treatment modality for oral lichen planus.

## CONCLUSION

The highlight of the case reported is that vitamin D has a promising role in the management of erosive lichen planus, especially in postmenopausal women. We would also like to highlight the importance of serum vitamin D investigation in patients who present with oral lichen planus, so that any deficiency of vitamin D can be diagnosed promptly and treatment can be initiated appropriately. Future studies on a larger sample size involving other types of lichen planus with longer follow-up are necessary to establish the role of vitamin D in oral lichen planus.

## CLINICAL SIGNIFICANCE

The role of vitamin D in the pathogenesis and management of oral lichen planus has to be investigated, especially in postmenopausal women in whom there is an increased incidence of osteoporosis and lichen planus.

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