

# Oral Lichen Planus: Is Vitamin D Deficiency a Predisposing Factor? A Case Report

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## Abstract

Lichen planus is not an uncommon disease. Many contributing factors are suggested in the etiopathogenesis of lichen planus. According to literature immunity, plays a key role in etiology of lichen planus. Vitamin D as a cofactor in the disease is scarcely discussed in the literature. Coexistence of vitamin D deficiency and oral and cutaneous lichen planus with remission of symptoms of both conditions by vitamin D therapy is reported in this case report. Vitamin D being a strong immune modulator the authors feel that further studies are needed to confirm the role of vitamin D in the expression and manifestations of lichen planus which may help us to deliver better treatment for lichen planus.

**Keywords:** Auto immune diseases, Erosive lichen planus, Oral lichen planus, Vitamin D deficiency

## INTRODUCTION

Oral lichen planus (OLP), a chronic inflammatory condition of unknown etiology affecting both skin and mucosa, it is a hall marked predominantly by T cell-mediated immune reaction and also changes in the epithelial keratinization.<sup>1-3</sup> Both antigen-specific and non-specific mechanisms are suggested in the pathogenesis of lichen planus. Even though, vitamin D is a known immunomodulator acting on pleiotropic cells, not much data is available connecting vitamin D deficiency to lichen planus.<sup>4</sup> Following is a case report in a patient with concurrent vitamin D deficiency and lichen planus both of which showed improvement after vitamin D therapy.

## CASE REPORT

A 40-year-old female patient reported with the chief complaint of burning sensation of gums and tongue for the last 2 months while having hot and spicy food. Medical history revealed that the patient was under treatment for muscle, multiple joints and lower

back pain since 1 year. Patient was on non-steroidal antiinflammatory drugs since 1 year due to the same pain. Patient had taken many treatments for the same, but there was no relief from pain. Personal and family histories were non-contributory. General examination revealed abnormal gait and difficulty in walking and multiple pigmented pruritic lesions on right leg. On extra oral examination, pigmentations in lip and reduced mouth opening were noticed. Intraoral examination revealed erythematous, desquamated lesions involving both the marginal and attached gingiva of the mandibular and maxillary anterior teeth labially. Further examination showed white, radiating striations bordering an erosive area involving right and left buccal mucosa, hard palate and dorsal surface of the tongue.

From the history, general examination and intra-oral examination we arrived at a provisional diagnosis of oral erosive lichen planus with cutaneous lichen planus. Because of the severity of pain and difficulty in mouth opening biopsy was not done. Patient's medical history and health status made us refer the patient to an endocrinologist for systemic status evaluation. The patient was instructed to

apply a thin layer of Kenacort cream 0.1% (triamcinolone acetone) directly on the lesion 3 times a day for a week as a symptomatic treatment to relieve pain and symptoms, followed by multi-vitamin tablet and *aloe vera* juice (60 ml/day) for 1 month. On the first recall visit, a slight reduction in burning sensation and erythematous areas were noticed. Mouth opening was normal. Patient was diagnosed as having vitamin D deficiency by the endocrinologist. Blood investigation showed reduction in serum calcium and vitamin D levels. Patient was administered cholecalciferol 300,000 units intramuscular injection for vitamin D deficiency by the endocrinologist and was asked to evaluate the status after 3 months. Oral hygiene instructions were reinforced, and the patient was asked to continue the same medication and recalled again after 2 weeks. On re-evaluation after 2 weeks the erythematous desquamated area were reduced, and burning sensation was completely absent.

Two other cases of lichen planus with vitamin D deficiency reported in our department. Both were female patients one 45 years of age and the other was 23-years-old, who had similar medical history and systemic signs and symptoms. Both of them showed vitamin D deficiency when blood investigation was done. Patient was sent for consultation with endocrinologists but did not turn up for further treatment.

## DISCUSSION

The incidence of vitamin D deficiency in three cases of OLP, and the improvement of signs of OLP with vitamin D supplementation in the first patient led the authors to formulate the hypothesis connecting lichen planus and vitamin D deficiency. The immune suppressant and modulation properties of vitamin D are already established. Vitamin D has got action on both B and T lymphocytes. The omnipresent expression of vitamin D receptors (VDR) in myriad of immune cells like activated T and B cells highlights the role of vitamin D in the modulation of various types of immunity.<sup>4</sup> There is ample evidence in literature to prove that Vitamin D deficiency complements incidence of numerous malignancies, metabolic and cardiovascular diseases, neurological, and immune disorders including autoimmune diseases apart from the well-known role in bone disorders.<sup>5</sup> Thus, VDR signaling can modulate the innate and adaptive immunity.

It is an established fact that lichen planus is an immune-related condition, and the erosive form has a definite potential for malignancy.<sup>6</sup> Erosion and atrophy render the oral mucosa more susceptible to the action of local carcinogens.

A considerable number of *in vitro* and *in vivo* studies indicate that the most active metabolite of vitamin D-1, 25-dihydroxycholecalciferol or calcitriol has anti-proliferative, pro-apoptotic, prodifferentiating, and anti-angiogenic properties. Combined treatment of calcitriol and many types of cytotoxic agents has synergistic or at least additive effects.<sup>7</sup>

Epidemiological evidence indicates a significant association between vitamin D deficiency and an increased incidence of autoimmune diseases. Van Belle *et al.*<sup>8</sup> has reviewed role of vitamin D in autoimmune diseases like Type 1 diabetes, multiple sclerosis, rheumatoid arthritis, systemic lupus erythematosus, inflammatory bowel disease, asthma and in infectious diseases which is supporting our hypothesis of vitamin D deficiency as a contributing factor in lichen planus.

Vitamin D insufficiency among the general population is increasing due to increased use of sunscreen, increased indoor activities and greater skin coverage with clothing.<sup>9</sup> Thus, efforts to reduce the incidence of skin cancer may have the unintentional consequence of promoting vitamin D deficiency.<sup>9</sup> Of late the incidence of OLP also is on the rise. One may positively correlate these two. Further studies are needed.

Some interventional trials<sup>10</sup> have demonstrated that supplementation with vitamin D or its metabolites can reduce blood pressure in hypertensive patients, improve blood glucose levels in diabetics and symptoms of rheumatoid arthritis and multiple sclerosis. There are various ongoing studies aiming at improving the knowledge of the role of vitamin D in immune associated diseases, in which some clinical trials are targeting to address the outcome of vitamin D supplementation on disease manifestation. Even though, data available are still scanty and sometimes inconsistent, it seems that the data supporting the potential use of vitamin D supplementation is strongest to a greater extent for autoimmune diseases.

## CONCLUSION

Correlating the increased prevalence of vitamin D deficiency as well as several autoimmune diseases and allergic diseases one may suggest that there is a strong association between these conditions. Recent studies have also suggested that increased intake of vitamin D may reduce the risk of these diseases. However, no studies conclusively demonstrate a direct cause and effect. The deleterious effects of hypervitaminosis D is also an established fact. Dosage of vitamin D thus remains ambivalent.

The primary aim of this article is to suggest that it will be preferable to check the vitamin D levels also, especially when the patients present with lichen planus and concurrent risk factors for vitamin D deficiency like decreased sun exposure, genetic predisposition and constitutional symptoms of back pain, multiple joint pain etc.

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