

# Recent Advancements in Oral Lichen Planus Management: An Overview

<sup>1</sup>Athira Joshy, <sup>2</sup>Nagabushana Doggalli, <sup>3</sup>Karthikeya Patil, <sup>4</sup>Jai Shankar, <sup>5</sup>Chikkarasinakere J Gowda  
<sup>6</sup>Prasannasrinivas Deshpande

## ABSTRACT

**Introduction:** Lichen planus is a chronic inflammatory, auto-immune, mucocutaneous disease of which the etiology is unknown. In Greek “lichen” means tree moss and “planus” means flat. It affects the skin, mucous membrane, nails, and hair. It is seen in 1 to 2% of the population. As the exact causative factor for oral lichen planus (OLP) is a matter of conflict, the failure to achieve proper or specific treatment for it may be reason for its incomplete regression. Corticosteroids are the mainstay of OLP but because of their adverse effects various other agents have been tried in the treatment of OLP.

**Aim:** The aim of this review is to provide an update on the recent advances in the treatment of OLP.

**Results:** An electronic search was conducted across Medline, Cochrane, Web of Science databases, and Google Scholar for the purpose of literature analysis on the mentioned topic. The studies were reviewed and compared. This article summarizes the recent advances in the treatment of OLP.

**Conclusion:** Oral lichen planus has been an advanced researched oral potentially malignant disorder over the years. The newer treatment modalities have been considered to be beneficial with lesser amount of side effects than corticosteroids like amlexanox (AX), aloe vera gel, green tea, curcumin, propolis, and lycopene.

**Clinical significance:** Oral lichen planus is seen in 1 to 2% of the population who come with varied symptoms or may be asymptomatic. Although treatment options are plenty, the mainstay of treatment is corticosteroids. However, the use of alternate therapeutics is proven to be effective with lesser side effects.

**Keywords:** Aloe vera, Green tea, Oral lichen planus, Propolis, Recent advances.

**How to cite this article:** Joshy A, Doggalli N, Patil K, Shankar J, Gowda CJ, Deshpande P. Recent Advancements in Oral Lichen Planus Management: An Overview. *World J Dent* 2018; 9(3):249-251.

**Source of support:** Nil

**Conflict of interest:** None

## INTRODUCTION

Lichen planus is a chronic inflammatory, autoimmune, mucocutaneous disease of which the etiology is unknown.

In Greek the meaning “lichen” is tree moss and “planus” is flat.<sup>1</sup> It affects the skin, mucous membrane, nails, and hair. It is seen in 1 to 2% of the population.

As the exact causative factor for OLP is a matter of conflict, the failure to achieve appropriate or exact treatment for it may be the reason for its incomplete regression. It can also undergo malignant transformation due to the lack of universal diagnostic criteria.<sup>2</sup> The most predictably beneficial medication or the first line of treatment of OLP has been corticosteroids,<sup>3</sup> but because of their adverse effects alternate therapeutic approaches are being carried out. Various new agents to treat OLP are the following: AX, aloe vera gel, amitriptyline, green tea, curcuminoids, ignatia, low-intensity laser therapy, hyaluronic acid (HA), propolis, purslane extract, lycopene, pimecrolimus, and topical thalidomide. Amitriptyline, AX, thalidomide, aloe vera, HA, and propolis are used as topical agents, whereas purslane, lycopene, green tea, and ignatia are used systemically.

This article aims to provide an update on the recent advancements in the management of OLP.

Corticosteroid administered topically, intralesionally, or systemically is the management of choice for OLP, since it dampens the cell-mediated immunity. According to various researchers the combined therapy of topical and systemic steroids is effective. Topical application of corticosteroids two to four times daily is recommended to treat topical oral lesion; 0.025% clobetasol propionate, 0.1% triamcinolone acetonide, and 0.05% fluocinonides are the mainly used topical agents. Prednisone is the most commonly prescribed systemic steroid.<sup>4</sup> According to the patient’s need, the dosage and the form of preparations should be used cautiously to reduce side effects.

Amitriptyline is a tricyclic antidepressant, which could be used to treat lichen planus as depression is considered as one of the causative agent. Javadzadeha et al<sup>5</sup> compared the mouthwash which contains ketoconazole, clobetasol, and amitriptyline with dexamethasone tablet (0.5 mg in 5 mL water), 30 nystatin drops, and 5 mL diphenhydramine syrup. The therapy was found to be effective among the patients suffering from OLP.

Amlexanox is an anti-inflammatory drug and is available in the form of a paste, which contains 5% of AX. It is very effective when used on the oral mucosal lesions and there are no significant side effects. It increases the

<sup>1-6</sup>Department of Oral Medicine and Radiology, JSS Dental College & Hospital, JSS University, Mysuru, Karnataka, India

**Corresponding Author:** Nagabushana Doggalli, Department of Oral Medicine and Radiology, JSS Dental College & Hospital JSS University, Mysuru, Karnataka, India, e-mail: drbushan@rediffmail.com

content of intracellular cyclic adenosine monophosphate in inflammatory cells thereby inhibiting the production and secretion of tumor necrosis factor-alpha (TNF- $\alpha$ ), leukotrienes, and histamine. Fu et al<sup>6</sup> compared the efficacy of 5% AX paste with 0.043% dexamethasone paste and found AX as effective as dexamethasone.

Curcuminoids are the major components of *Curcuma longa* (turmeric). It has been a part of Ayurvedic medicine for centuries in India, as it is nontoxic and has a variety of ameliorative properties including antioxidant, analgesic, anti-inflammatory, antiseptic, and anticarcinogenic activity. Various studies have shown that higher doses of curcuminoids (6000 mg/day) are effective in the management of OLP. But according to few researchers about 40% had side effects.<sup>7</sup>

The low-intensity lasers are being used in health care studies since more than three decades. It brings about local vasodilatation thereby causing the immune cells to move into the tissue. It helps in controlling the inflammation of the oral cavity by modulating the function of mast cells. A study conducted by Elshenawy et al showed complete remission of symptoms with no associated side effects.<sup>8,9</sup>

Purslane is a weed, which belongs to the family Portulacaceae. It consists of various vitamins like A, C, and E, omega 3 fatty acid,  $\beta$ -carotene, minerals, and melatonin. It has anti-inflammatory, antiulcerogenic, antifungal, and antioxidant properties. It is also found to be effective in case of infections, urinary, and digestive conditions. The melatonin which is present in the purslane acts by stimulating antioxidant enzymes and also as a free radical scavenger. According to various researches, melatonin and omega-3 fatty acids prevent the amelioration of malignancy. On considering its therapeutic properties, purslane can be used as an alternate therapy for patients with OLP.<sup>10</sup>

Thalidomide is an immunomodulatory drug. It has anti-immunologic and anti-inflammatory properties. It is being used in the management of aphthous stomatitis, erythema nodosum leprosum, rheumatoid arthritis, myelodysplastic syndromes, and Crohn's disease as it has the capability to reduce the formation of TNF- $\alpha$ .<sup>11,12</sup> It is found to be effective in the management of OLP because of its various therapeutic properties, such as anti-inflammatory, anti-angiogenesis, and immunomodulatory properties. Wu et al<sup>13</sup> compared the efficacy of 1% thalidomide paste with 0.043% dexamethasone paste and found that topical thalidomide is as effective as dexamethasone in the treatment of erosive OLP.

Lycopene is a red-colored carotenoid, which gives red color to tomatoes and several other fruits. It has a variety of therapeutic properties like inhibition of cancer cell proliferation, antioxidant activity, inducing phase II

enzymes, interference with growth factor stimulation, regulation of transcription, and restoration of gap junctions.<sup>14,15</sup> According to the study conducted by Saawarn et al,<sup>16</sup> lycopene 8 mg/day reduces the symptoms of OLP.

Aloe vera gel is a plant which belongs to the family Liliaceae. Its therapeutic properties include antibacterial, anti-inflammatory, antifungal, antiviral, and hypoglycemic effects.<sup>17-19</sup> It inhibits the inflammatory process either by reducing the level of TNF- $\alpha$  and leukocyte adhesion or it interferes with the action of arachidonic acid pathway via cyclooxygenase. A study conducted by Choonhakarn et al<sup>20</sup> found that 70% aloe vera gel was safe and effective in the management of OLP.

Hyaluronic acid: The polymerization of N-acetylglucosamine disaccharide and glucuronic acid forms HA, which is a hygroscopic macromolecule. It mainly helps in the healing of tissue by activating and moderating the response of inflammatory cells, promoting the proliferation of cells, angiogenesis, and migration.<sup>21</sup> A study performed by Nolan et al<sup>22</sup> to evaluate the effectiveness of a HA gel preparation (topical) in the treatment of OLP found that topical application of HA has improved the pain scores in comparison with placebo. The frequency of application should be increased to obtain better result as its action is not long lasting.

Green tea: It consists of polyphenols, such as epicatechin-3-gallate, epicatechin, epigallocatechin-3-gallate, and epigallocatechin.<sup>23</sup> It has chemopreventive and anti-inflammatory properties. It inhibits presentation of antigen, migration, activation, and proliferation of T-cell, and also controls other inflammatory mediators, thereby managing OLP by regulating the nonspecific and antigen-specific mechanisms concerned regarding the etiopathogenesis of OLP. It was also found that the consumption of green tea can prevent the malignant transformation of OLP.<sup>24,25</sup> Zhang et al<sup>26</sup> hypothesized that consumption of green tea might reduce the incidence of OLP and provide a means of harmless and economical beneficial therapy for OLP.

Ignatia: Ignatia is extracted from the *Strychnos ignatii* beans. It was considered poisonous as it contained high levels of strychnine. But in smaller doses it could be used as a laxative.<sup>27</sup> It is considered as one of the homeopathic remedies for the treatment of depression and anxiety symptoms. Hence, it could also be used in the management of lichen planus as psychological conditions are considered as one of the causative factor.<sup>28</sup>

Propolis: Propolis or bee glue is being used since centuries in Ayurvedic medicine. It has anti-inflammatory, antioxidant, antibacterial, antiviral, antifungal, antitumor, antiradiation, and immunomodulating effect. It is also considered to be nontoxic. These properties have prompted investigators to check its efficacy on OLP.

A study was done by Zyada et al<sup>29</sup> to assess the efficacy of topical mucoadhesive gel containing propolis in the treatment of OLP and proved that propolis showed to be a promising pharmacological agent for inhibiting epithelial cell proliferation and has anti-inflammatory effect in these OLP lesions.

## CONCLUSION

A long time has passed since the first diagnosis of OLP and till date no treatment could completely heal the lesion. This could be because of the various immune responses and condition of the individual patient or unpredictable etiology. After a much thorough review of literature, further intensive studies and research will be mandatory for the complete cure of patients suffering from OLP.

## REFERENCES

- Farhi D, Dupin N. Pathophysiology, etiologic factors, and clinical management of oral lichen planus, part I: facts and controversies. *Clin Dermatol* 2010 Jan-Feb;28(1):100-108.
- Patil S, Rao RS, Sanketh DS, Sarode SC, Sarode GS. A universal diagnostic criteria for oral lichen planus: an exigency!. *Int J Contemp Dent Med Rev* 2014;2014:041214.
- Greenberg MS, Glick M, Ship JA. *Burket's oral medicine*. 11th ed. Hamilton: BC Decker; 2008.
- Shadab S, Sodhi SJ, Patil SP, Tambe SD, Kasat R. Management of oral lichen planus: overview. *Pravara Med Rev* 2016;8(1).
- Javadzadeha A, Vatanpour H, Delavariana Z, Momajed A, Esmaeily H, Vatanpour M, Shirazian S. Efficacy of clobetasol, ketoconazole and amitriptyline mouthwash on oral lichen planus. *Iranian J Pharm Res* 2008;7(3):171-178.
- Fu J, Zhu X, Dan H, Zhou Y, Liu C, Wang F, Li Y, Liu N, Chen Q, Xu Y, et al. Amlexanox is as effective as dexamethasone in topical treatment of erosive oral lichen planus: a short-term pilot study. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2012 May;113(5):638-643.
- Chainani-Wu N, Madden E, Lozada-Nur F, Silverman S Jr. High-dose curcuminoids are efficacious in the reduction in symptoms and signs of oral lichen planus. *J Am Acad Dermatol* 2012 May;66(5):752-760.
- Elshenawy HM, Eldin AM, Abdelmonem MA (2015) Clinical assessment of the efficiency of low level laser therapy in the treatment of oral lichen planus. *Open Access Maced J Med Sci* 3(4):717-721.
- Eduardo Fde P, Bueno DF, de Freitas PM, Marques MM, Passos-Bueno MR, Eduardo Cde P, Zatz M. Stem cell proliferation under low intensity laser irradiation: a preliminary study. *Lasers Surg Med* 2008 Aug;40(6):433-438.
- Agha-Hosseini F, Borhan-Mojabi K, Monsef-Esfahani HR, Mirzaii-Dizgah I, Etemad-Moghadam S, Karagah A. Efficacy of purslane in the treatment of oral lichen planus. *Phytother Res* 2010 Feb;24(2):240-244.
- Franks ME, Macpherson GR. Thalidomide. *Lancet* 2004 May 29;363(9423):1802-1811.
- Matthews SJ, McCoy C. Thalidomide: a review of approved and investigated uses. *Clin Ther* 2003 Feb;25(2):342-395.
- Wu Y, Zhou G, Zeng H, Xiong CR, Lin M, Zhou HM. A randomized double-blind positive control trial of topical thalidomide in erosive oral lichen planus. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2010 Aug;110(2):188-195.
- Levy J, Sharoni Y. The functions of tomato lycopenes and its role in human health. *Herbalgram* 2004 62:4956.
- Stahl W, Sies H. Lycopene: A biologically important carotenoid for humans? *Arch Biochem Biophys* 1996 Dec 336(1):1-9.
- Saawarn N, Shashikanth MC, Saawarn S, Jirge V, Chaitanya NC, Pinakapani R. Lycopene in the management of oral lichen planus: a placebo-controlled study. *Indian J Dent Res* 2011 Sep-Oct;22(5):639-643.
- Shelton RM. Aloe vera; its chemical and therapeutic properties. *Int J Dermatol* 1991 Oct;30(10):679-683.
- Vogler BK, Ernst E. Aloe vera: a systematic review of its clinical effectiveness. *Br J Gen Pract* 1999 Oct;49(447):823-828.
- Yagi A, Kabash A, Okamura N, Haraguchi H, Moustafa SM, Khalifa TI. Antioxidant, free radical scavenging and anti-inflammatory effects of aloesin derivatives in aloe vera. *Planta Med* 2002 Nov;68(11):957-960.
- Choonhakarn C, Busaracome P, Sripanidkulchai B, Sarakarn P. The efficacy of aloe vera gel in the treatment of oral lichen planus: a randomized controlled trial. *Br J Dermatol* 2008 Mar;158(3):573-577.
- Ialenti A, Di Rosa M. Hyaluronic acid modulates acute and chronic inflammation. *Agents Actions* 1994 43:44-47.
- Nolan A, Badminton J, Maguire J, Seymour RA. The efficacy of topical hyaluronic acid in the management of oral lichen planus. *J Oral Pathol Med* 2009 Mar;38(3):299-303.
- Cabrera C, Artacho R, Gimenez R. Beneficial effects of green tea—a review. *J Am Coll Nutr* 2006;25:79-99.
- Yoneyama S, Kawai K, Tsuno NH, Okaji Y, Asakage M, Tsuchiya T, Yamada J, Sunami E, Osada T, Kitayama J, et al. Epigallocatechingallate affects human dendritic cell differentiation and maturation. *J Allergy Clin Immunol* 2008 Jan;121(1):209-214.
- Kawai K, Tsuno NH, Kitayama J, Okaji Y, Yazawa K, Asakage M, Sasaki S, Watanabe T, Takahashi K, Nagawa H. Epigallocatechin gallate induces apoptosis of monocytes. *J Allergy Clin Immunol* 2005 Jan;115(1):186-191.
- Zhang J, Zhou G. Green tea consumption: an alternative approach to managing oral lichen planus. *Inflamm Res* 2012 Jun;61(6):535-539.
- Marzotto M, Conforti A, Magnani P, Zanolin ME, Bellavite P. Effects of *Ignatia amara* in mouse behavioural models. *Homeopathy* 2012 Jan;101(1):57-67.
- Mousavi F, Sherafati S, Mojaver YN. *Ignatia* in the treatment of oral lichen planus. *Homeopathy* 2009 Jan;98(1):40-44.
- Zyada MM, El-Said Elewa M, El-Meadawy S, El-Sharkawy H. Effectiveness of topical mucoadhesive gel containing propolis in management of patients with atrophic and erosive oral lichen planus: clinical and immunohistochemical study. *Egypt Dent Assoc* 2012;58:1-3.