Oral Lichen Planus Treated with Photodynamic Therapy, Could be Possible?

Cinzia Casu*, Luca Viganò² and Matteo Fanuli³

¹DDS, Private Dental Practice, Cagliari, Italy.
²DDS, Department of Radiology, San Paolo Dental Building, Milano, University of Milan, Italy.
³RDH, Department of Biomedical, Surgical and Dental Sciences, University of Milan, Italy.

*ginzia.85@hotmail.it

Abstract

Oral Lichen Planus (OLP) is a common chronic mucocutaneous inflammatory disorder that dominantly occurs among women and involves 2-5% of the general population. Various topically treatments are proposed for the therapy of OLP but collateral events are connected with the use of these drugs, so researchers had to try to find alternative treatments for OLP, also such as Photodynamic Therapy (PDT). Several works demonstrated its effectiveness but there are different types of light application, type of photosensitizer, time of application used in the literature. According to recent literature findings, it emerges that photodynamic therapy is certainly a valid treatment for oral lichen planus but we are not yet able to establish specific protocols.

Keywords: Oral Lichen Planus, Photodynamic Therapy, Toluidine Blue Solution, Methylene Blue Solution

Introduction

Lichen planus is a common chronic mucocutaneous inflammatory disorder, which generally affects adults between the ages of 30-60 years and often precipitated by several types of drugs such as antibiotics, antihypertensives, diuretics, and so on. Oral Lichen Planus (OLP) is mainly classified into 3 main clinical forms: reticular, erosive, and atrophic (1). Reticular white lesions are overall asymptomatic and require no treatment; however, patients with erosive-atrophic forms of OLP often need treatment for pain and discomfort (1). This disease dominantly occurs among women and involves 2-5% of the general population. Also, its possible onset is in the decade 4-5 of life (2). The exact etiopathogenesis of this oral disease is still unknown, and current evidence suggests that maybe there is an inflammatory cell-mediated immune response to an unknown trigger (1). Various topically treatments are proposed for the therapy of OLP: corticosteroids, immunosuppressants such as cyclosporin, tacrolimus, and retinoids have been tried to relieve OLP (2). The most commonly used drugs are corticosteroids, but other drugs such as azathioprine, calcineurin inhibitors, mycophenolate mofetil, dapsone, retinoids, and hydroxychloroquine can be used in recalcitrant cases. Collateral events are connected with the use of these drugs, so researchers had to try other types of treatment for OLP such as Laser Therapy (3), Ozone Therapy (4, 5).

Photodynamic Therapy (PDT) for the treatment of symptomatic oral lichen planus is described in scientific literature. Photodynamic Therapy relies on the interaction between a photosensitizer, a light with the appropriate wavelength, and the presence of free reactive oxygen-derived molecules. The reaction between the three elements generates ROS in cells that take up the photosensitizer, causing cell death by necrosis or apoptosis, but spares the surrounding tissue (6). Several works demonstrated its effectiveness but there are different types of light application, type of photosensitizer, time of application used in the literature. The most recent review of Al-Maweri et al. include only five works, in which the efficacy of PDT was compared with topical corticosteroids and the authors concluded that in two studies has been reported PDT to be as effective as corticosteroids, 1 study reported a better efficacy of PDT compared to corticosteroids, whereas two studies found PDT to be inferior
to corticosteroids\(^7\). Laser wavelengths, duration of irradiation, and power density ranged between 420-660 nm, 30 seconds to 10 minutes, and 10-500 mW/cm\(^2\), respectively. All studies reported PDT to be effective in the management of symptomatic OLP\(^7\). Another recent review of Akram et al. includes only six works, because only these respected the selection criteria, and all studies reported that PDT was effective in the treatment of OLP in adult patients at follow-up. However, PDT did not show significant improvement when compared with steroid therapy\(^1\). The literature reviews are generally too selective and do not take into account most of the clinical work. A study showed a success treatment with toluidine blue and diode laser\(^8\), in another one the patients were treated with 5% methylene blue mediated photodynamic therapy using Fotosan device (diode light at 630 nm wavelength) with results very similar to the patients treated with desamethasone\(^9\). At University of Alexandria researchers have found better results with PDT performed with methylene blue and diode laser than topical corticosteroids\(^10\). In a clinical trial with 22 patients treated, 5% solution of 5-aminolevulinic acid was used to permorm PDT\(^11\). An ALA-saturated occlusive dressing was applied directly onto a lesion and surrounding mucosa 2 hs prior to illumination with a custom-made diode lamp (light of 630 nm, dose of 300 mW). After a series of 10 weekly illumination sessions the patients were monitored for 12 months. However the mean reduction in size of the lesion treated after 10-session therapy was 8.05%. The authors said that healing continued and further reduction in size (by 69.13%) took place during the 12-month observation: 39.62% of lesions\(^8\). A chlorin e\(_6\) (Photolon\(^®\)), containing 20 % chlorin e\(_6\) and 10 % dimethyl sulfoxide was also proposed as a photosensitizer\(^12\).

### Conclusion

Although the literature reviews are generally too selective and do not take into account most of the clinical works, it is also true that often the data are not comparable, because the methods used are too different\(^10,11\), the absence sometimes of control groups\(^12\), follow-up too short. According to most recent datas of the literature it emerges that photodynamic therapy is certainly a valid treatment for oral lichen planus but establishment of specific protocols are not available yet.

### References

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