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No Efficacy of Photodynamic Therapy with Toluidine Blue in Oral Lichen Planus.

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ABSTRACT

Oral lichen planus (OLP) is one of the commonest oral mucosal diseases. It is thought to be autoimmune disease mediated through T-lymphocytes to a still unknown antigen. Gold standard are topical corticosteroids although in some cases they are not useful. Furthermore, certain side-effects with prolonged use have been reported. Lately the role of photodynamic therapy has emerged as one of the treatment modalities, however, results from the studies are scarce. Therefore, we evaluated use of toluidine blue with GaAlAs laser (685 nm wavelength, 2.00 J/cm², power 30mW, area 1.00 cm², time 01ms, frequency continuous) in five patients with resistant oral lichen planus (unresponsive to topical corticosteroid treatment) every two days (total number of six irradiations). The results of this study showed that this therapy was not efficient in patients with OLP. Therefore, we do not suggest use of toluidine-mediated photodynamic therapy in some patients with refractory oral lichen planus.

Keywords: Oral Lichen Planus, OLP, mucosal disease, photodynamic therapy.

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INTRODUCTION

Oral lichen planus (OLP) is a chronic autoimmune disease which affects mostly females and occurs after the age of 50. It is characterized by periods of active disease (symptomatic) and remission period (asymptomatic). In most of the OLP patients two week course of topical corticosteroids will resolve inflammation and symptoms, however, there are cases which are refractory to the prolonged use of topical corticosteroids. Therefore, new treatment options are to be searched. Although various therapies have been tried in patients with OLP, still the golden standard is topical corticosteroid use which has certain side effects especially when used for longer period of time. Reported side effects include candidiasis, gastrointestinal disturbances, diabetes, hypertension, Moon face and adrenal insufficiency. Furthermore, in some cases the use of corticosteroids has proven to be ineffective. Photodynamic therapy (PDT) was introduced in 1960 for the treatment in various medical specialties. PDT relies on the capacity of low level laser energy (630-906 nm) which by use of certain photosensitizers (dyes such as toluidine blue and methylene blue; porphyrin-based ones such as photophrin and topical application of 5-aminolevulinic acid, and last but not least chlorophyll-based ones such as chlorines, purpurins, bacteriochlorins) enters affected cells which have increased proliferative activity (and as seen in oral precancerous lesions such as oral leukoplakia, oral lichen planus and even oral cancer) (1). The consequence of this lead to the chemical reaction which in the presence of oxygen produces singlet oxygen or superoxide resulting in the cell damage by direct and indirect cytotoxicity (2). It has been reported that PDT results in the cellular damage, membrane lysis and protein inactivation, however the exact mechanism of action is not well understood (3). Furthermore, it seems that PDT leads to apoptosis of proliferative inflammatory cells (4). Finally, it seems that topical PDT being a selectively toxic to tissues does not have any side-effects. Its' main disadvantage is that in some patients (mostly head and neck cancer patients), lack of response to PDT might be seen (5). The aim of this study was to evaluate effect of PDT in five patients with refractory OLP.

MATERIALS AND METHODS

In five patients with refractory OLP, toluidine blue was applied with cotton stick on the affected areas. After ten minutes lesions were irradiated with GaAlAs laser (685 nm wavelength, 2.00 J/cm², power 30mW, area 1.00 cm², time 01ms, frequency continuous) on the first, third, fifth, eighth, tenth and twelfth day.

RESULTS

Table 1. Patients' demographic data.

PATIENT	AGE	OLP LESIONS
1.female	60 years	Both buccal mucosa and alveolar ridge
2.male	80 years	Bot lateral sides of the tongue
3.female	50 years	Only gingiva
4.female	74 years	Alveolar ridge
5.female	65 years	Alveolar ridge

DISCUSSION

There are not many published papers upon use of PDT in oral lichen planus. Various researchers used different photosensitizers. Therefore, more studies with established parameters are sought. Aghahosseini et al. (4) treated 13 OLP patients (26 lesions) after gargling 5% methylene blue solution in water for five minutes. Ten minutes after laser was applied (wavelength 632 nm, light exposure dose was 120 J/cm², spot size of 2.5-3.0 cm², fluence of 100 J/cm²). Improvement in sign scores was achieved in 16 lesions. Four hyperkeratotic lesions were gone completely. Average size reduction was 44.3%. There was a significant decrease in symptoms and signs after one week of treatment and at follow-up sessions up to 12 weeks. Aghahosseini et al. (7) also reported beneficial effects of PDT in two OLP patients after single session with diode laser (wavelength 632 nm, light exposure dose was 120J/cm², spot size of 2.5-3.0 cm², fluence of 100 J/cm²). In one patient the lesion completely disappeared in other size reduction of 40% on the right buccal mucosa and 20% on the left buccal mucosa was noticed. However, tongue lesion did not respond at all. Sadaksharam et al. (8) studied 20

patients with OLP who were treated with 5% methylene blue mediated photodynamic therapy (Xenon arc lamp, wavelength 630 nm, total dose 120 J/cm² per session in four sessions (1,4,7 and 15th day). Follow-up was performed on the second and fourth week after therapy. There was a significant improvement in symptoms and signs of the lesion on the first and second follow-up. Sobaniec et al. (5) used chlorine e6 and 10% dimethyl sulfoxide (Photolon) as a photosensitizer and laser (660 nm, density of 90 J/cm²) in 23 OLP patients. Appointments were scheduled at 2-week intervals, but no longer than ten sessions. Patients were evaluated on the first, second, fifth and tenth PDT appointment. The same authors (5) reported that average reduction of OLP lesions was 55%. The best results were obtained on the lesions affecting lining mucosa (cheeks and lips). Kvaal et al. (9) used topical methyl 5-aminolevulinatate (MAL) photodynamic therapy in 14 patients with OLP and showed that long-lasting improvement was achieved after a single treatment. Recently, Jajarm et al. (10) applied topically toluidine blue with micropipette and after 10 minutes OLP patients were treated with 630 nm wavelength GaAlAs laser (power density 10 mW/cm²) during two visits and compared to the corticosteroid mouthwash and after nystatin in total of 25 patients. In the study and control group sign scores of changes significantly reduced after both treatments, however, there were no significant differences between the two treatments. The intensity of the lesions significantly reduced after treatment, but there was a significant difference between the groups. Improvement of pain was significantly increased in corticosteroid group.

The results of this study have shown that PDT with toluidine blue was not efficient in five patients with refractory OLP. Therefore, we might conclude that PDT with toluidine blue was not helpful in our patients with OLP.

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