

Original Research

Assessment of salivary oxidative stress in oral lichen planus using malonaldehyde (MDA)

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ABSTRACT:

Background: Oral lichen planus is a chronic disease that can persist in some patients for a long time. The present study was conducted to evaluate salivary oxidative stress in oral lichen planus using malonaldehyde (MDA). **Materials & Methods:** 76 patients having oral lichen planus of both genders were enrolled in this study. Two groups were prepared. Group I comprised of OLP patients and group II had healthy subjects. 1.5 ml of fasting saliva sample was collected using passive drool method. Saliva samples were stored at -20°C . The MDA levels were estimated by thiobarbituric UA TBA reaction using trichloroacetic acid TCA. **Results:** Group I comprised of 30 males and 46 females and group II had 36 males and females each. The mean MDA level in group I was 1.38 U/ml and in group II was 0.92 U/ml. The difference was significant ($P < 0.05$). **Conclusion:** Oral lichen planus patients showed increased level of malonaldehyde as compared to healthy control subjects.

Key words: Oral lichen planus, oxidative stress, malonaldehyde

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INTRODUCTION

Lichen planus (LP) is a common, chronic inflammatory mucocutaneous disease of unknown etiology and putative autoimmune pathogenesis.¹ It was first described by Erasmus Wilson in 1869. Oral LP (OLP) has an unknown true prevalence, but its incidence is reported to be approximately 0.5-2% of the world's population. OLP affects women more often than men at a ratio of 3:2.²

Oral lichen planus is a chronic disease that can persist in some patients for a long time. In contrast to cutaneous lichen planus, the oral form may persist for up to 25 years. Oral lesions may coexist with lesions of the genital mucous membranes or with lesions of cutaneous lichen planus.³ Oxidative stress is defined as the imbalance between the production of reactive oxygen species (ROS) and the ability of the biological system to readily detoxify the reactive intermediates or easily repair the resulting damage.⁴ This results in the production of free radicals that can damage cell membranes. To defend such damage, the body possesses several antioxidant systems which

prevent oxidative stress.⁵ Somebody fluids like saliva contain such activity, as saliva is naturally composed of several antioxidants (i.e., uric acid [UA], glutathione and ascorbic acid) and this defensive mechanism is called salivary antioxidant system. Malondialdehyde (MDA) is used as an indicator of lipid peroxidation.⁶ The present study was conducted to evaluate salivary oxidative stress in oral lichen planus using malonaldehyde (MDA).

MATERIALS & METHODS

The present study comprised of 76 patients having oral lichen planus of both genders. The consent was obtained from all enrolled patients.

Data such as name, age, gender etc. was recorded. Two groups were prepared. Group I comprised of OLP patients and group II had healthy subjects. 1.5 ml of fasting saliva sample was collected using passive drool method. Saliva samples were stored at -20°C . The MDA levels were estimated by thiobarbituric UA TBA reaction using trichloroacetic acid TCA. Data thus obtained were subjected to

statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Status	OLP	Control
M:F	30:46	36:36

Table I, graph I shows that group I comprised of 30 males and 46 females and group II had 36 males and females each.

Graph I

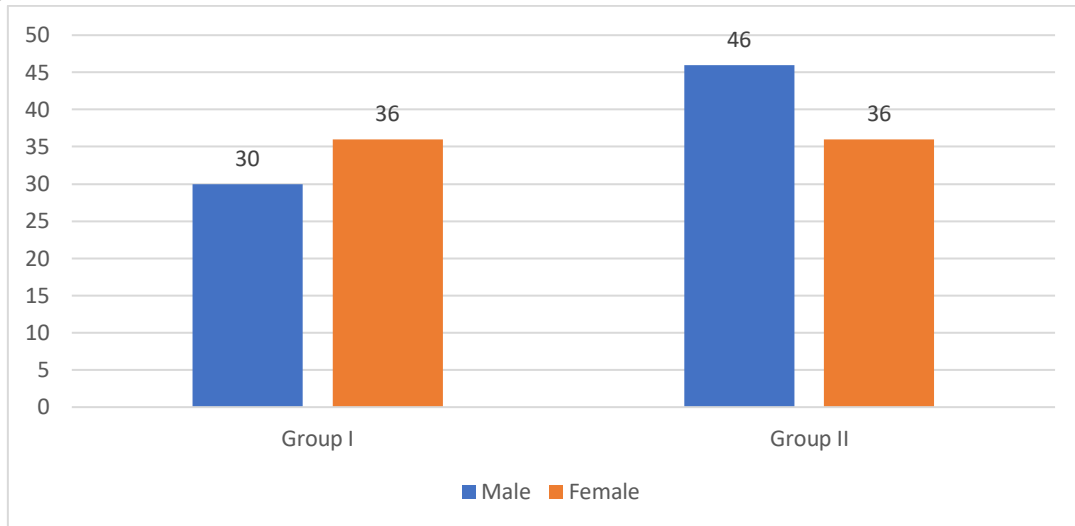
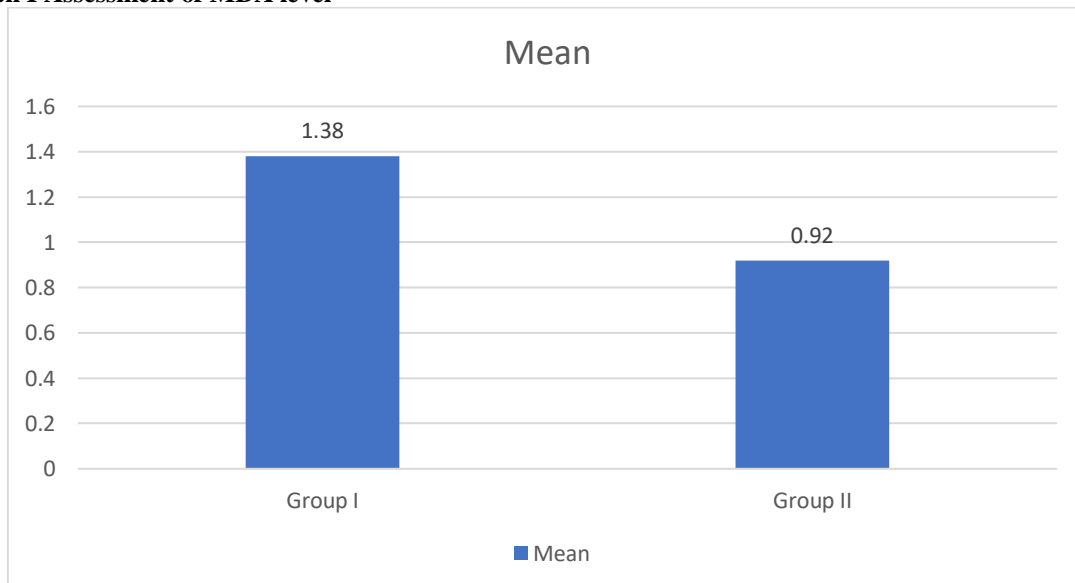


Table II Assessment of MDA level

Groups	Mean	P value
Group I	1.38	0.001
Group II	0.92	

Table II, graph I shows that mean MDA level in group I was 1.38 U/ml and in group II was 0.92 U/ml. The difference was significant (P< 0.05).

Graph I Assessment of MDA level



DISCUSSION

Cutaneous lesions of OLP typically present as small (2 mm) pruritic, white to violaceous flat-topped papules,

which can increase in size to as much as 3 cm. They often occur bilaterally on the flexor surfaces of the extremities.⁷ OLP was originally classified as one of

six forms by Andreason: reticular, papular, plaque-like, atrophic, erosive, and bullous. This classification has been difficult, as many patients might have several forms at any given time.⁷The reticular, papular and plaque-like forms are usually painless and appear clinically as white keratotic lesions.⁸ The erosive, atrophic and bullous forms are often associated with a burning sensation and in many cases can cause severe pain. In the oral cavity, zinc is found in saliva, dental plaque and in the hydroxyapatite of the dental enamel. It contributes to healthy teeth formation, and is used in mouth rinses and toothpaste due to its important role in the prevention of plaque and dental calculus formation.⁹MDA is the principal and most studied end product of polyunsaturated fatty acid peroxidation. It has been considered a good marker of free radical-mediated damage and oxidative stress. Thiobarbituric UA Reactive Substances Assay TBARS is the most commonly employed method of MDA estimation.¹⁰The present study was conducted to evaluate salivary oxidative stress in oral lichen planus using malonaldehyde (MDA).

We found that group I comprised of 30 males and 46 females and group II had 36 males and females each. Sezer et al¹¹ in their study SOD activity was determined in 40 oral LP patients. Serum SOD levels (18.19 ± 3.71 U/mL) in patients with LP were also higher than in healthy controls ($P = 0.002$) which was similar to the present study on saliva.

We observed that the mean MDA level in group I was 1.38 U/ml and in group II was 0.92 U/ml. Rekha et al¹² evaluated the role of oxidative parameters in the pathogenesis of oral LP, estimate the levels of superoxide dismutase (SOD), malondialdehyde (MDA), glutathione peroxidase (GPx) and uric acid (UA) in saliva of oral LP patients and to compare the levels of SOD, MDA, GP and UA in oral LP patients with healthy controls. In this cross-sectional study, 1.5 ml of fasting saliva sample was collected using passive drool method from the study group (30 patients diagnosed as having oral LP) and the control group (30 age-matched healthy volunteers). The unstimulated saliva was collected and analyzed by spectrophotometry. The mean values of SOD and MDA in saliva in the study group showed a significant increase in amount when compared with the control group whereas GPx showed a significant decrease in the study group. UA value showed an insignificant difference in the same comparison.

Agha-Hosseini et al¹³ in their study in thirty patients with OLP stated that the mean level of unstimulated whole saliva MDA in patients with OLP was significantly higher than that of the control group ($t = 2.34$, $P < 0.05$). Shirzad et al¹⁴ found levels of salivary MDA as 0.49 ± 0.30 μ M; remarkably higher in oral

LP patients compared to the control group (0.15 ± 0.11 μ M) ($P < 0.0001$).

CONCLUSION

Authors found that oral lichen planus patients showed increased level of malonaldehyde as compared to healthy control subjects.

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