Short Communications

Evaluation of serum Malondialdehyde level in patients with oral lichen planus

Masoumeh Mehdipour [1], Ali Taghavi Zenouz [2], Somayeh Dastanpour[3], Ayla Bahramian[4], Narges Gholizadeh[5], Saranaz Azari-Marhabi[3]✉

1. Associate Professor, Department of Oral Medicine, Faculty of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Associate Professor, Department of Oral Medicine, Faculty of Dentistry, Tabriz University of Medical Sciences, Tabriz, Iran.
3. Assistant Professor, Department of Oral Medicine, Faculty of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
4. Assistant Professor, Department of Oral Medicine, Faculty of Dentistry, Tabriz University of Medical Sciences, Tabriz, Iran.
5. Assistant Professor, Department of Oral Medicine, Faculty of Dentistry, Tehran University of Medical Sciences, Tehran, Iran.

✉**Corresponding Author:** Saranaz Azari-Marhabi, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Email: saranazazari@yahoo.com **Tel:** +982122413897

Received :7 Sept 2016 Accepted: 4 Mar 2017

Abstract

Introduction: Malondialdehyde (MDA) is a useful determinant to show high level of lipid peroxidation which lead to impaired cell function. Previous studies have mentioned there is a relationship between high oxidative stress and low anti-oxidant activity in patients with oral lichen planus. The aim of this study was to evaluate serum level of Malondialdehyde as an indicator of oxidative stress in patients with oral lichen planus which is a chronic inflammatory disease with unknown etiology.

Materials & Methods: This descriptive-comparative study evaluated the oxidative stress status on twenty patients with oral lichen planus and 20 control healthy individuals based on serum level of Malondialdehyde.

Results: The mean serum Malondialdehyde levels in oral lichen planus patients and control individuals were 2.9 (±2) and 2.4 (±1.3) µg/ml, respectively, indicating no significant difference (P=0.6).

Conclusion: According to the results, role of Malondialdehyde in cellular damage and pathogenesis of oral lichen planus was not proved**.**

Keywords: Lichen planus, Malondialdehyde, Oxidative stress

Citation for article: Mehdipour M, Taghavi Zenouz A, Dastanpour S, Bahramian A, Gholizadeh N, Azari-Marhabi S. Evaluation of serum Malondialdehyde level in patients with oral lichen planus. Caspian J Dent Res 2017; 6:45-8.

[Downloaded from cjdr.ir on 2026-11-09]

[DOR: 20.1001.1.22519890.2017.6.1.4.5]

[DOI: 10.22088/cjdr.6.1.45]

ارزیابی سطح سرمی مالون دي آلدئید در بیماران مبتلا به لیکن پلان دهانی

معصومه مهدی پور، علی تقوی زنوز، سمیه داستانپور، آیلا بهرامیان، نرگس قلی زاده، ساراناز آذری مرحبی*

چکیده

مقدمه: مالون دی آلدئید شاخصی جهت نشان دادن پراکسیداسیون لیپید است که منجر به نقص عملکرد سلولی میگردد. مطالعات قبلی ارتباط بین سطوح بالای استرس اکسیداتیو و سطح پایین فعالیت آنتی اکسیدانی را در بیماران با لیکن پلان دهانی نشان دادند..هدف این مطالعه ارزیابی میزان سرمی مالون دی آلدئید در بیماران لیکن پلان بود.لیکن پلان بیماری التهابی مزمن با اتیولوژی نامشخص میباشد.

مواد و روش ها: این مطالعه توصیفی وضعیت استرس اکسیداتیو بر اساس ارزیابی سطح سرمی مالون دی آلدئید ۲۰ بیمار لیکن پلان و ۲۰ فرد گروه کنترل ارزیابی شد.

یافته ها: متوسط سطح سرمی در بیماران لیکن پلان وجمعیت کنترل به ترتیب(۲/۹(±۲ و (۲/۴(±۱/۳ µg/ml بود. با وجودی که میزان مالون دی آلدئید در بیماران لیکن پلان بالاتر بود، تفاوت معنی داری میان دو گروه وجود نداشت.

نتیجه گیری: با توجه به نتایج، نقش مالون دی آلدئید در آسیب سلولی و پاتوژنز لیکن پلان دهانی در این مطالعه اثبات نشد.

واژگان کلیدی: لیکن پلان، مالون دی آلدئید ،استرس اکسیداتیو

Introduction

Oral lichen planus (OLP) is a common inflammatory disease with the prevalence of 0.5-2.2% in general population. In recent years, many studies have suggested the role of oxidative stress in the etiology of oral lichen planus as an autoimmune disease.[1] Noticeable increase of lipid peroxidation products and diminished antioxidant defensive system have been reported in patients with genital lichen planus. Effect of oxidative stress indices in pathophysiological changes occurring in basal cells of epidermis has also been pointed out.[2] Malondialdeid (MDA) has been considered as the main production of unsaturated fatty acids' peroxidation which can be a sign of oxidative stress and has been defined as a suitable biomarker of endogenous DNA damage .[3,4] The role of oxidative stress in the etiopathogenesis of oral lichen has been described by some researchers through estimating the levels of oxidative markers like MDA in various samples – serum, saliva and tissue. Studies by Rai et al. (2010) and Ergun et al. (2011) demonstrated the comparative analysis of serum MDA levels and saliva of the same group of patients in a therapeutic trial. [5, 6] Sander et al, performed a study on the samples of genital erosive lichen planus by immunohistochemistry method and reported higher MDA levels at epidermis and nearby dermal inflammatory infiltration in comparison with healthy controls and stated that this elevation is a sign of destruction of enzymatic anti-oxidative system in epiderm.[2] Most Previous studies in this field have been carried out on dermal and genital lichen planus.[7] Therefore, the aim of the current study was to evaluate the oxidative stress status with serum Malondialdehyde level in an Iranian population with OLP to detect the ethiopathogenesis of disease.

Material & Methods

In this descriptive-comparative study approved by ethics committee of Tabriz Medical University (No: 9166), twenty patients with OLP and twenty healthy persons as control group were homogenized in terms of age and entered into the study. The sample size was determined according to previous studies.[8] The whole study procedure was described to the patients and informed consent was obtained from the patients who entered into the study. A clinical diagnosis of OLP was established when reticular or popular textures were clinically present, and findings such as basal cell degeneration, infiltrations of inflammatory cells like T lymphocytes were observed histopathologically. The diagnosis of the keratotic lichen planus and erosive lichen planus was confirmed by the clinical features and clinicopathological features, respectively. Exclusion criteria were a) the presence of any stimulus leading to

[Downloaded from cjdr.ir on 2026-11-09]
[DOR: 20.1001.1.22519890.2017.6.1.4.5]
[DOI: 10.22088/cjdr.6.1.45]

the lichenoid reactions including assumption of any medications, b) the appearance of the lesions near the amalgam restorations, c) the presence of any factors which could alter the equilibrium of production and elimination of free radicals; (such as cigarette smoking, alcohol consumption), d) the use of hydrogen peroxide mouth-rinse, having a diet full of fruit and vegetables, immunosuppressed patients, the use of antioxidant drugs (vitamin E and vitamin C), steroids, NSAIDS, and e) possible history of trauma or surgery during the last four weeks. Patients with systemic diseases, malignancies or dermal diseases, which would influence on the immune system.

After chart completion and necessary examinations, biopsy was done. Then, 5 cc blood samples were taken from both groups and after isolation of serum, sera samples were frozen and kept at 70°C for one month. The test was done at laboratories of Tabriz Imam-Reza hospital.

In this test, the measurement of serum MDA level was carried out using Human MDA ELISA kit (Cusabio, USA) and ELISA apparatus (ELISA micro plate reader BIOTEK). The collected data were analyzed using Mann-Whitney U test in SPSS 16. $P<0.05$ was considered statistically significant in this study.

Results

The mean age of lichen planus patients and control individuals was 34.1 and 35.6, respectively with no significant difference between the groups. 50 percent of Patients with oral lichen planus were female. The mean serum MDA levels in lichen planus patients and healthy individuals were 2.9 (2±) and 2.4µ 1.3± g/ml, respectively. It should be stated that MDA index mean was more in OLP patients than healthy individuals but this difference was not statistically significant (P=0.6).

Discussion

In the current study, MDA index mean was more in OLP patients than healthy individuals but the difference was not statistically significant. Lipoperoxidation which results from the oxidation of membrane-associated polyunsaturated fatty acids of phospholipids has been considered a major presentation of oxidative stress .[3] MDA has been presumed as the main production of unsaturated fatty acids' peroxidation which can lead to reduction in cellular membrane permeability, devastating cellular structure and function which is incorporated in pathogenesis of most of disease .[2-4] MDA is addressed as a biomarker which is indicator of cellular destruction.[4] Oxidative stress has also been evaluated by other markers such as Serum Nitric Oxide in previous studies.[8]

The findings of current study are different from some of the studies which evaluated the oxidative stress status in tissue specimen or salivary samples of patients with lichen planus. Different findings in these studies compared to the present study could be attributed to the different sample sources such as saliva and tissue samples in former studies and sera samples in current study. [4-6]

Aly and Sezer conducted studies on 45 lichen planus patients and on 40 patients with LP (None of the patients had the oral erosive variants of LP),respectively. They concluded that the serum level of MDA was considerably increased.[7,9]

In the study of Ergun et al., salivary and serum level of MDA and total anti-oxidative activity in 21 patients with oral lichen planus were investigated and it was revealed that there was a difference in comparison with healthy group.[6]

The variants of LP were different in most of these studies. Few of the patients in Aly and Sezer's studies had OLP and none of them had erosive type but in the current study, patients only had OLP without cutaneous lesions.[7, 9] In the present study, only two forms of OLP were evaluated; therefore, the authors would suggest studying the problem of oxidative stress in different forms of OLP to confirm the opinion hypothesized on etiopathogenesis of the disease. And also as proposed by the reviewers it is suggested that different types of OLP to be discussed separately.

Although the oxidative stress process is the cause of lichen planus is approved in many researches, findings regarding oxidative stress indices were not similar in these studies. [3,4] Unlike other studies, Agha-Hosseini et al. stated the oxidative stress processes role at OLP ethiopathogenesis and reported elevated level of salivary MDA in OLP as an index but TAC (total antioxidant capacity) was not different among lichen planus and healthy control. [10]

Conclusion

Although the role of MDA in the OLP cellular damage process was not approved in the current study, further studies with larger and different sources of samples are needed to evaluate this index and other oxidative stress indices in different forms of OLP, separately.

[Downloaded from cjdr.ir on 2026-11-09]
[DOR: 20.1001.1.22519890.2017.6.1.4.5]
[DOI: 10.22088/cjdr.6.1.45]

Acknowledgements

This study was supported by the Research Council of Tabriz University of Medical Sciences. The authors would like to thank the Council for assistance in carrying out this study.

Funding and Conflict of interest: The authors declare that there is no conflict of interest for any of them.

Authors' contributions

The study was designed by Masoumeh Mehdipour and Ali Taghavi Zenouz. The study data were collected by Ayla Bahramian and Somayeh Dastanpour. Analysis and interpretation of data, drafting of the manuscript, and critical revision of the manuscript for important intellectual content were performed by Saranaz azari-marhabi and Narges Gholizadeh .Study supervision was performed by Masoumeh Mehdipour.

References

1. Gupta S, Jawanda MK. Oral lichen planus: An update on etiology, pathogenesis, clinical presentation, diagnosis and management. Indian J Dermatol 2015;60:222-9.
2. Sander CS, Cooper SM, Ali I, Dean D, Thiele JJ, Wojnarowska F. Decreased antioxidant enzyme expression and increased oxidative damage in erosive lichen planus of the vulva . BJOG 2005; 112: 1572-5.
3. Mishra SB, Umamaheswari TN. Evaluation of oxidative stress in oral lichen planus using malonaldehyde: A systematic review. J Dermatol Dermatol Surg 2014; 18: 2-7.
4. Del Rio D, Stewart AJ, Pellegrini N. A review of recent studies on malondialdehyde as toxic molecule and biological marker of oxidative stress. Nutr Metab Cardiovasc Dis 2005;15:316-28.
5. Rai B, Kaur J, Jacobs R, Singh J. Possible action mechanism for curcumin in pre-cancerous lesions based on serum and salivary markers of oxidative stress. J Oral Sci 2010;52:251-6.
6. Ergun S, Troşala SC, Warnakulasuriya S, Özel S, Önal AE, Ofluoğlu D, et al. Evaluation of oxidative stress and antioxidant profile in patients with oral lichen planus. J Oral Pathol Med 2011; 40:286-93.
7. Aly D, Shahin RS. Oxidative stress in lichen planus. Acta Dermatovenerol Alp Pannonica Adriat 2010;19: 3-11.
8. Mehdipour M, Taghavi Zenouz A, Bahramian A, Gholizadeh N, Boorghani M.Evaluation of serum nitric oxide level in patients with oral lichen planus .J Dent (Shiraz) 2014 ; 15: 48–51.
9. Sezer E, Ozugurlu F, Ozyurt H, Sahin S, Etikan I. Lipid peroxidation and antioxidant status in lichen planus. Clin Exp Dermatol 2007 ;32: 430-4.
10. Agha-Hosseini F, Mirzaii-Dizgah I, Mikaili S, Abdollahi M. Increased salivary lipid peroxidation in human subjects with oral lichen planus. Int J Dent Hyg 2009 ;7:246-50.

[Downloaded from cjdr.ir on 2026-11-09]
[DOR: 20.1001.1.22519890.2017.6.1.4.5]
[DOI: 10.22088/cjdr.6.1.45]