

# SALIVARY VITAMIN E AND C IN LICHEN PLANUS

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## ABSTRACT

**Background:** Lipid peroxidation may be involved in the pre-cancer process and essential nutrients that can scavenge free radicals, such as vitamin E and C constitute a strong line of defense in retarding free radical induced cellular damage. The present study was planned to investigate the salivary levels of vitamin C and E in patients with oral Lichen planus.

**Material & Methods:** It was a comparative cross-sectional study, conducted at Jain diagnostic Centre, New Delhi, India. Antioxidant vitamin E and C levels were estimated in 10 patients of oral Lichen planus and 7 healthy persons served as controls.

**Results:** The salivary levels of vitamin C were significantly decreased in patients with oral Lichen planus as compared to controls ( $p < 0.05$ ). Also, vitamin E levels were low in oral Lichen planus as compared to controls ( $p < 0.05$ ). There was a significant positive correlation between fall in vitamin C and vitamin E ( $r = 0.65$ ,  $p < 0.05$ ).

**Conclusion:** Antioxidant defenses (vitamin E and C) are compromised and oxidative stress increased in patients with oral Lichen planus.

**Key words:** Oral Lichen planus, Antioxidant, Vitamin E, Vitamin C, Saliva.

## INTRODUCTION

Lipid peroxidation may be involved in the process of oral cancer and essential nutrients that can scavenge free radicals, such as vitamin E and C, constitute a strong line of defense in retarding free radical induced cellular damage.<sup>1</sup> Free radical mediated lipid peroxidation may be involved in the cancer. An increase in the lipid peroxidation products and a decrease in antioxidant activity is reported in cancer as compared to normal.<sup>2,3</sup> Randomized controlled trials have shown that antioxidant (vitamin C and E) supplementation may be beneficial in the prevention of cancer.<sup>4,5</sup> Antioxidant nutrients counteract these free radical disturbances and thereby protect cell membranes against free radical mediated lipid peroxidation.<sup>1</sup>

The present study was planned to investigate the salivary levels of vitamin C and vitamin E in patients with oral Lichen planus.

## MATERIAL AND METHODS

It was a comparative cross-sectional study, conducted at Jain diagnostic Centre, New Delhi, India. Ten patients (M:F 5:5), age group 20-38 years were selected. All diagnostic tests (including histopathology) evaluated for diagnosing oral Lichen

planus. Seven (M: F 4:3) normal healthy subject with age (19-35 years) were taken as controls. Un-stimulated whole saliva from subjects was collected over ice and the samples were centrifuged and frozen at  $-20^{\circ}\text{C}$  until analysis. Vitamin C and vitamin E were estimated by high pressure liquid chromatography (HPLC). HPLC separations were accomplished at room temperature (approx.  $37^{\circ}\text{C}$ ) with acecil liquid chromatography system (Series 1100, USA) consisting a sample injection valve with a 30  $\mu$  and sample loop, an ultraviolet (mv) spectrophotometer detector, a integrator and techsphere ODS-2 packed (4  $\mu$ m particle and 80.4 pore size) column (250x4.6 ID) with a methanol: acetonitril: chloroform (45: 41: 10 V/V) as mobile phase at 1 ml/min flow rate. All procedures were performed under light protected conditions.

Data was analyzed by using SPSS 7.0, and student t-test was applied.

## RESULTS

The salivary levels of vitamin C were significantly decreased in patients with oral Lichen planus as compared to controls ( $p < 0.05$ ). Also, vitamin E levels were low in oral Lichen planus as compared to controls ( $p < 0.05$ ). Table-1 There was a significant positive correlation between fall in vitamin C and vitamin E ( $r = 0.65$ ,  $p < 0.05$ ). Table-1

**Table-1: Salivary vitamin C and E levels in controls and patients with oral Lichen planus.**  
(Mean  $\pm$  SD)

Parameters	Controls(n=7)		Patients(n=10)	
	Male (n=4)	Female (n=3)	Male (n=5)	Female (n=5)
Vitamin C (mg/ml)	1.11 $\pm$ 0.17	1.01 $\pm$ 0.13	0.79 $\pm$ 0.18	0.68 $\pm$ 0.15
Vitamin E (mg/ml)	0.39 $\pm$ 0.18	0.38 $\pm$ 0.14	0.20 $\pm$ 0.17	0.19 $\pm$ 0.18

p<0.05 at all levels

## DISCUSSION

There exists a relationship between free radical activity and malignancy<sup>2,6,7</sup> and excess free radical disturbances are typically accompanied by increased utilization of antioxidants, resulting in decrease in their concentrations. In the present study, we observed a fall in both vitamin C and vitamin E levels in oral Lichen planus as compared to normal controls. Water soluble antioxidant nutrients (reduced vitamin C) are initially consumed, followed by lipid soluble antioxidants (alpha tocopherol) in quenching the free radicals. Also, it has been reported that vitamin C regenerates vitamin E by non-enzymic mechanism.<sup>8</sup> In addition, vitamin E and C have been demonstrated to inhibit superoxide production in the pig coronary artery suggesting that beneficial effects of antioxidant vitamins are in part due to alterations in vessel redox status.<sup>9</sup> The decrease in antioxidant nutrient levels observed in this study indirectly supports the concept that free radical mediated lipid peroxidation and related antioxidant consumption may be involved in the patho-physiologic mechanisms of oral Lichen planus.

Human defenses against oxidative stress and free radical damage primarily consist of antioxidant enzymes and nutrients. The antioxidant enzymes (superoxide dismutase, catalase and glutathione peroxidase) are synthesized in the body and their concentrations cannot be easily influenced. In contrast, antioxidant nutrient levels can be simply manipulated by dietary or pharmacologic supplementation. The concept of increased utilization of vitamin C and E in patients raises the possibility of potential protective role for antioxidant nutrients in oral Lichen planus. It makes the mucosal cells more vulnerable to the cytotoxic effects of reactive oxygen species. This creates more favorable circumstances for DNA damage and disease progression. So, antioxidant supplements (vitamin C and E) may have role in oral Lichen planus patients.

## CONCLUSION

Antioxidant defenses (vitamin E and C) are compromised and oxidative stress increased in patients with oral Lichen planus.

Antioxidant nutrients may be utilized in oral Lichen planus patients to counteract free radical mediated cell disturbances.

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