

# Assessment of Serum Vitamin B12 and Folic Acid in Patients with Oral Lichen Planus: A Case Control Study

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## KEY WORDS

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## ABSTRACT

**Statement of Problem:** Oral Lichen Planus (OLP) is a chronic immunologic disorder with unknown etiology. Stress and anxiety are some risk factors for OLP and Vitamin B12 and folic acid have been proved to be effective micro-nutrients for prevention of anxiety and depression.

**Purpose:** The purpose of this study was to investigate serum Vitamin B12 and folic acid deficiency in patients with OLP.

**Materials and Method:** Forty eight individuals (32 cases with histopathologically proven OLP and 16 healthy subjects) were recruited. Serum folic acid and Vitamin B12 were assessed for each individual. T-test was applied for data analysis.

**Results:** Vitamin B12 deficiency was found in 8 of 32 cases with OLP (25%) while in the control group it was found in 12.5% of the subjects ( $p > 0.05$ ). Of the 32 patients with OLP, one had folic acid deficiency while none of the control subjects had such a deficiency ( $p > 0.05$ ).

**Conclusion:** Although Vitamin B12 deficiency in OLP patients did not show a statistically significant difference compared with healthy subjects, it was approximately twice as much as the control group. And it can be suggested that Vitamin B12 may have some effective roles in OLP pathogenesis while folic acid deficiency cannot be considered as a prominent risk factor in OLP. More studies are needed to prove such relation.

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## Introduction

Lichen Planus is a chronic immunologic disorder that can cause local irritation and discomfort [1]. Oral lesions are quite common in patients with cutaneous Lichen Planus and it has been shown that 75% of the patients with lesions on the skin experience oral lesions as well [2]. Lichen Planus is a disease of mid-

dle ages and affects females more than males [3]. Several different management modalities have been used to treat OLP but none of them has shown promising effects as a definitive cure for the disease [4-6]. Complete relief is rare and most treatments have only temporary relief on the signs and symptoms of OLP [7]. An immune mediated pathogenesis is recognized

in OLP although the exact etiology is unknown [8].

Hematological abnormalities have been shown to be present in patients with OLP [9]. It has been revealed that OLP patients have red cell folate deficiency [10]. Vitamin B12 and folic acid are fundamental factors for precise function of human immune system [11]. On the other hand, OLP has long been known as an immune mediated disorder [12]. Furthermore, stress and anxiety are some risk factors for OLP and Vitamin B12 and folic acid have been proved to be effective micronutrients for prevention of anxiety and depression [13-15]. So, the purpose of this study was to compare the serum level of these two micronutrients in OLP patients and healthy subjects.

### Materials and Method

Forty eight subjects participated in this case-control study. Thirty two patients with OLP constituted the case group and 16 healthy individuals made up the control group. The sample size was based on a pilot study. The case group consisted of patients from oral medicine department of Tehran University of Medical Sciences, Dental School with proven OLP based on histological and clinical criteria. The patients with clinical diagnosis of OLP underwent incisional biopsy. Sixteen sex and age matched healthy individuals were also recruited as control group. The case and control subjects were between 30 to 70 years old, without any systemic diseases and did not take any medication or supplement during the previous 3 months. An informed consent was taken from each participant (cases and control). Serum folic acid and Vitamin B12 were assessed for each individual by Diasorin kit using gamma counter. Serum Vitamin B12 less than 160 pg/ml and folic acid less than 1.5 ng/ml were considered as deficiency [9]. T-test was applied for data analysis, using SPSS 11.5.

### Results

The case group included 28 females (87.5%) and 4 males (12.5%) and the control group consisted of 11 females (68.7%) and 5 males (31.3%).

Although Vitamin B12 deficiency in OLP patients was approximately twice as much as the control group, there was no statistically significant difference between the groups considering the level of serum Vitamin B12 ( $p = 0.799$ ). We have also found no difference between the level of serum folic acid in OLP patients and control group ( $p = 0.490$ ) (Table 1).

**Table 1** Frequency of VitaminB12 and Folic acid deficiency in case and control groups

Variant	Groups	Case (%)	Control (%)	Total (%)	P.value
Vitamin B12	<160 pg/ml	8 (25)	2 (12.5)	10 (20.8)	0.799
	>160 mg/ml	24 (75)	14 (87.5)	38 (79.2)	
Total		100	100	100	
Folic acid	<1.5 mg/ml	1 (3.1)	0 (0)	1 (2.1)	0.490
	>1.5 mg/ml	31 (96.9)	16 (100)	47 (97.9)	
Total		100	100	100	

### Discussion

According to the results of this study, we could not find any significant difference between the two groups regarding the level of serum vitamin B12 and folic acid. This is in contrast with the findings of Challacombe and Jolly who found some hematological abnormalities such as vitamin B12 and folic acid deficiency in patients with OLP and other oral conditions such as candidiasis, leukoplakia and non-specific stomatitis [9-10]. But it is similar to Young's study that showed no significant differences between OLP and healthy subjects in relation to level of vitamin B12 and folic acid [16]. In Kleier's study on 24 patients, it was found that patients with OLP had a significant decrease in the folic acid level in comparison with healthy subjects while in our study on 32 OLP patients folic acid level was not significantly deficient [17].

However, in our study the percentage of patients with OLP who had vitamin B12 deficiency (25%) was quite remarkable. More investigations in greater sample size are needed to find any significant relationship in this regard. This fact that only one patient with OLP had folic acid deficiency states that the role of folic acid in the pathogenesis of OLP may not be of

great importance. Assessment of red cell folate which is still a better means for evaluating long term deficiencies can be recommended to overcome such circumstances. A relationship was found between the level of folic acid and that of vitamin B12 in this population of OLP patients and healthy subjects ( $p < 0.05$ ). As we know, deficiency of serum vitamin B12 disturbs folate metabolism and can cause folic acid deficiency [18]. So, in patients with vitamin B12 deficiency, measurement of serum folic acid is highly recommended. According to the findings of this study, 50% of men with OLP had vitamin B12 deficiency. This ratio was 21.5% for women. This fact emphasizes that the role of vitamin B12 may be more prominent in the pathogenesis of OLP in men than in women. A clinical distinction was made between patients with erosive/atrophic type of OLP and keratotic type. Of the 32 patients, 20 were diagnosed clinically as erosive/atrophic type and 12 as keratotic type. The frequency of serum vitamin B12 deficiency in the erosive/atrophic group was 30% that was greater than the keratotic group (16.6%). This proposes a more important role for serum vitamin B12 deficiency in the erosive form of OLP, having a greater potential for dysplastic transformation. We should be concerned about the possibility of malnutrition among patients with erosive atrophic type due to pain during mastication. Because of its ability in DNA repair and synthesis, vitamin B12 has been known to have a preventive role in cancer formation [19-20]. More studies are required to prove any relationship between vitamin B12 deficiency and occurrence of dysplasia in OLP.

Considering the role of vitamin B12 in providing normal function for neuropsychologic system and on the other hand the fact of neuropsychologic disturbances such as depression and anxiety as predisposing factors for OLP, we can conclude that one should pay attention to regulating this micronutrient among normal population. Although we could not find a statistically significant correlation between vitamin B12 deficiency and OLP, it seems that vitamin B12

may have some roles in the pathogenesis of specific subtypes of OLP and its function may be more prominent and obvious in males than females. So, more studies in this field are suggested.

### Conclusion

Although vitamin B12 deficiency in OLP patients did not show a statistically significant difference compared with the healthy subjects, it was approximately twice as much as the control group. It can be suggested that vitamin B12 may have some effective roles in OLP pathogenesis while folic acid deficiency cannot be considered as a prominent risk factor in OLP. More studies are needed to prove such relation.

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