Original Article

Assessment of Serum Levels of Vitamin B12 and Folic Acid in Iraqi Patients with Lichen Planus

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ABSTRACT

Objective: To assess serum levels of vitamin B12 and folic acid in patients with lichen planus.
Study Design: Comparative study
Place and Duration of Study: This study was conducted at the Department of Oral Medicine, College of Dentistry, Uruk University, Iraq from 1st March 2024 to 31st August 2024.
Methods: We examined the serum vitamin B12 and serum folate levels of 44 patients who presented with oral/skin and mixed lichen planus. Blood samples were obtained by venipuncture, sera were separated in sterile tube stored frozen until assay, and an Amersham International vitamin B12/folate DUAL radio assay kit was utilized for the purpose of determining the levels of vitamin B12 and folate in human serum.
Results: 18.1% of the subjects had low levels of serum vitamin B12 and serum folic acid, which is significantly higher than the 6.3% of the subjects who served as controls and the percentage was not markedly distinct from the control group.
Conclusion: Hematological disorders are less likely to increase the risk of developing various types of Lichen planus.
Key Words: B12 Vitamin, Serum folate, Oral lichen planus, Skin lichen planus.

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INTRODUCTION

Serum vitamin B12 and folic acid are important in the biosynthesis of amino and nucleic acids, and therefore; in cell division.[1] Megaloblastic anemia produced by deficiency of either of these vitamins is identical.[2] Serum vitamin B12 and folate deficiency has been reported in many oral mucosal diseases.[3-7]
Patients with recurrent aphthous ulceration (RAU) exhibited a greater prevalence of serum vitamin B12 and folate deficiency. Numerous studies indicate that deficiencies in iron, vitamin B12, and folic acid significantly contribute to the pathophysiology of RAU.[3,4]

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All RAU patients should undergo hematological screening. Other studies found that it is uncommon that a hematological abnormality plays a major role in the pathogenesis of RAU.
It is uncertain whether serum folate and vitamin B12 level assays must be done routinely unless there is a dietary deficiency; history of gastrointestinal diseases or abnormalities the blood indices.[5] A study revealed that no one in either the research group or the control group had abnormal serum vitamin levels, and the results showed no statistically significant differences in B12 or serum folate concentration. Patients with RAU do not usually need hematological testing beyond a full blood count and that serum vitamin insufficiency is not a major etiological factor in the disease.[6]
A shortage in folate significantly impacts the function of the hematological system and causes issues with cell turnover in the oral mucous membranes.[7] Folate deficiency may be observed in individuals undergoing treatment with Diphenylhydantoin (DPH).[8] Folic acid can affect the gingival hyperplasia severity; however, the mechanisms by which it operates are not well understood. Additionally, folate deficiencies have been shown to lead to the oral epithelial cells' degeneration.[9]
A Researcher discovered in their research that individuals on long-term anti-convulsant medications should be monitored for folic acid levels, as deficiency predominantly occurs in these individuals, and supplementation with folic acid appears to enhance

gingival health status.[10-11] The significance of hematological abnormalities in relation to non-ulcerative lesions of the oral mucosa is less definitive. The incidence of a hematological deviation was elevated in patients with Lichen Planus (LP), particularly in the erosive variant.[5,12]

The evaluation of vitamin B12 and folic acid in LP has been the subject of a limited number of investigations, as far as we are aware.[5,12] A comparison of the levels of serum folic acid and B12 that were measured with those of control cases is going to be the focus of this investigation.

METHODS

This comparative study was conducted at Department of Oral Medicine, College of Dentistry, Uruk University, Iraq from 1st March 2024 to 31st August 2024 vide letter No.3457/fg/Approval/dkd9872 dated 7th February 2024. Forty-four patients who were referred to the oral medicine clinic of the college of dentistry at the University of Baghdad and diagnosed with oral and/or cutaneous lichen planus were included in our study, together with the outpatients of clinical dermatology clinic, medical city, Baghdad. Additionally, twenty-two healthy controls were included. The diagnosis of oral and skin LP was based on clinical and histopathological criteria in accordance with the WHO recommendation.[13]

Blood samples were obtained by venipuncture, sera were separated in sterile tube stored frozen ' till assay, an Amersham internationals vitamin B12/folate DUAL radio assay kit was utilized for the purpose of determining the levels of vitamin B12 and folate in human serum. The data was entered and analysed through SPSS026. The difference in the prevalence of abnormalities between the study group and the control group, the chi-square test was utilized.

RESULTS

There were 19 females with an age range of 18-66 years (mean=42 year.) and 25 males with an age range of 27-70 year (mean=47.5 year). The lesions have been present for 3 weeks upto 12 years. Clinically a combination of twenty-two reticular LP, eight erosive LP, one pigmented LP, and one atrophy, with nine skin LP and three mixed LP (Table 1).

A serum vitamin B12 below 150 pg/ml was defined as low. A serum folate below 2g/ml was designated as low. Table 1 displays the results of serum folate and vitamin B12 in LP patients. Eight oral LP show a low value for serum folate, four was erosive type, two was reticular type, one skin LP and one mixed LP and all other values were within the accepted laboratory range of normal. Regarding vitamin B12 only three cases show low value, one erosive type, one reticular and one skin LP. The other cases show a normal laboratory value for vitamin B12. The chi square test was used and found no significant correlation between B12 and type of LP nor between folic acid and type of LP in comparison with the control cases (Table 2).

Table No.1: Clinical distribution of lichen planus patients (n=44)

Variable	No.	%
Atrophy	1	2.7
Erosive	8	18.2
Mixed	3	6.7
Pigmented	8	18.2
Reticular	18	40.7
Skin	6	13.5

Table No.2: Prevalence of serum B12 and Folate in patients with Lichen planus

Group	Number test	Mean±SD of Folic acid	Mean±SD of Vit. B12	Low Folate	Low Vit. B12	% of low folate & Vit. B12	P value
Lichen Planus	44	4.3+3.6	459.5+357.2	8	3	18.1%	NS
Controls	22	2.4+0.6	252.04+98.9	2	4	6.3%	NS

NS= Non-significant

DISCUSSION

According to the findings of forty-four individuals diagnosed with LP, the incidence of abnormalities in serum vitamin B12 and serum folic acid was 18.1%. in comparison with a prevalence of 6.3% in a healthy control subject. This result is harmonized with that of other studies.[12,14] Oral mucosa can be negatively impacted by deficiencies in vitamin B12 and folate, according to research findings.[14] In this study eight patients with oral LP show a low value for folic acid and three of them show a low value for vitamin B12. In comparison to the control group as well as other studies, this number did not show any significant differences.[12,14] Therefore in present study we could not find enough evidence to confirm these two findings and it seems unlikely that hematological abnormalities predispose to different type of LP.

The hematological deficiencies found in some patients with LP could be considered incidental to their diseases. In this study, four patients with erosive type of LP show low value for folate with one show low value for vitamin B12 and this result suggest that this depressed level may be secondary to ulceration.

Vitamin B12 is necessary for normal folic acid metabolism, which is responsible for converting the inactive form of folate into the metabolically active form. The value of vitamin B12 and folic acid in our study, as well as their relation between the two results, are in agreement with the fact that vitamin B12 is essential for this process.[15,16]

We agreed with the suggestion of the previous studies that when the blood indices revealed abnormalities or when there is gastrointestinal diseases history or dietary imbalance or deficiency, investigation for vitamin B12 and folate should be carried out.[9,12]

In addition to the relationship with other immunological diseases and the existence of a T-cell infiltrate, there is a substantial amount of information that lends support to the concept that LP manifests itself as an immune-related condition.[17] The similarity to the lichenoid change in the graft-versus-host reaction[18], and the presence in close apposition of lymphocytes to keratinocytes showing early apoptosis in the LP[19] and the demonstration of a LP specific antigen (LPSA) in skin and oral LP.[20-21]

It is worth noting that the present study included 44 patients only; it would be optimal if more sample size was utilized. Future studies with more sample size and comparison between genders would be recommended.

CONCLUSION

Hematological disorders are less likely to increase the risk of developing various types of Lichen planus.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Ahmed Adel Othman, Muntaha Fawzi Salih
Drafting or Revising Critically:	Ahlam Hameed Majeed, Abdalbseet A. Fatalla
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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