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Research Article

**ANALYSIS OF RELATION OF 1,25-DIHYDROXYVITAMMIN
D AND ITS PROTEIN IN PERIODONTITIS**¹Dr Mahnoor Asif, ²Dr Saad Maqsood, ¹Dr Aamna Islam¹Demontmorency College of Dentistry, Lahore, ²Medical Officer at RHC Mananwala,
Sheikhupura**Abstract:**

Introduction: Periodontitis is inflammation of the supporting tissues of teeth resulting in gingival detachment and disintegration of alveolar bone.

Aims and objectives: The main objective of the study is to analyze the relation of 1,25-dihydroxyvitamin D and its protein in periodontitis.

Material and methods: This cross-sectional study was conducted in Demontmorency College of Dentistry, Lahore during November 2018 to March 2019. The data was collected from 100 patients of both genders. The data was collected for the analysis of relation of vit-D and its binding protein with periodontitis. The data was collected through a properly designed questionnaire. This was including all the demographic data and medical data of patients.

Results: The data was collected from 100 patients. The mean age of participants was 31.23 ± 2.70 years and was not significantly different between the two groups. The oral health indices including gingival index, plaque index, calculus index, mobility index, CAL and PPD, were significantly higher in cases. The mean DBP levels in mild periodontitis were 65.33 ± 91.90 ug/mL and significantly increased along with the severity of periodontitis ($p=0.005$).

Conclusion: It is concluded that the levels of DBP increased significantly along with the severity of periodontal destruction and may be used as a biomarker to complement the diagnosis of periodontitis in early as well as late stages.

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INTRODUCTION:

Periodontitis is inflammation of the supporting tissues of teeth resulting in gingival detachment and disintegration of alveolar bone. This is a painless disease presenting with features of tooth mobility and bleeding from gingiva. Prevalence of periodontitis in adults globally is 5-20% with higher prevalence seen in Pakistan. Recent studies have shown strong association of periodontitis with systemic diseases such as cardiovascular disease, diabetes mellitus Type-2 and osteoporosis [1].

Chronic periodontitis is an inflammatory disease caused by dentogingival bacterial plaques and if left untreated, it causes progressive destruction of periodontal tissues, ultimately leading to tooth loss. In a subset of subjects with chronic periodontitis, there may be an increased risk of cardiovascular disease, diabetes mellitus, and complications of pregnancy. Periodontitis affects up to 50% of the adult population [2].

Vitamin D plays a role in maintaining the homeostasis of various biological systems including the neuromuscular, skeletal, cutaneous, cardiovascular, and immune systems. In addition, vitamin D has tumour suppressing, anti-inflammatory, and antibacterial properties [3]. While there is no doubt about the essential role of vitamin D in maintaining bone and calcium homeostasis, its role in other biological systems is less well-defined. Vitamin D is a secosteroid, which is synthesized from 7-dehydrocholesterol during a photochemical reaction under the effect of ultraviolet radiation on the skin or is consumed through digestion. Vitamin D₃ is further hydroxylated in the liver into 25-hydroxyvitamin D₃ (25(OH)D₃) [4]. This is the main and most stable form of vitamin D in blood plasma. It is a biologically active metabolite, one of the functions of which is maintaining the balance of calcium and phosphorus concentration in blood by regulating

their absorption in the intestines and reabsorption in kidney. It also assists in promoting the remodeling of the bones [5]. Constant low uptake of vitamin D and calcium leads to a negative calcium balance, disrupted bone mineralization, and loss of bone structure. Vitamin D deficiency leads to rickets in children, and osteoporosis (OP) in adults as well as an increased probability of bone fracture [6].

AIMS AND OBJECTIVES:

The main objective of the study is to analyze the relation of 1,25-dihydroxyvitamin D and its protein in periodontitis.

MATERIAL AND METHODS:

This cross sectional study was conducted in Demontmorency College of Dentistry, Lahore during November 2018 to March 2019. The data was collected from 100 patients of both genders. The data was collected for the analysis of relation of vit-D and its binding protein with periodontitis. The data was collected through a properly designed questionnaire. This was include all the demographic data and medical data of patients.

STATISTICAL ANALYSIS:

Descriptive statistics were used to evaluate the characteristics of each participant. Independent sample t-test was performed to test differences between 1,25(OH)₂ D and DBP among healthy controls and periodontitis.

RESULTS:

The data was collected from 100 patients. The mean age of participants was 31.23±2.70 years and was not significantly different between the two groups. The oral health indices including gingival index, plaque index, calculus index, mobility index, CAL and PPD, were significantly higher in cases. The mean DBP levels in mild periodontitis were 65.33±91.90 ug/mL and significantly increased along with the severity of periodontitis (p=0.005).

Table 01: Comparison of level of Vit-D levels before and after treatment

| | Before supplementation (n=19) | | After supplementation (n=19) | | P |
|-------------------------|----------------------------------|------|---------------------------------|------|----------|
| | Mean | SD | Mean | SD | |
| Serum 25(OH) D3 (ng/ml) | 13.96 | 3.36 | 35.12 | 5.27 | 0.001*** |

*Is a standard notation used to determine the level of significance. P value by independent sample "t" test. P<0.05 is considered to be statistically significant.
*P<0.05, **P<0.01, ***P<0.001. SD – Standard deviation; n – Sample size; NS – Statistically nonsignificant

DISCUSSION:

The effect of vitamin D and calcium supplements in treating systemic BMD decrease is based on its activity regulation of calcium and phosphorus concentration in blood. Constant low ingestion of vitamin D and calcium leads to a negative calcium balance, disrupted bone mineralization, and loss of bone structure [7]. Vitamin D deficiency causes rickets in children and OP in adults as well as an increased risk of bone fracture. The optimal 25(OH)D₃ recommended concentration in blood plasma for skeletal bone tissue is no lower than 80 nmol/L, for periodontal tissue approximately 90–100 nmol/L. Lower concentrations are associated with periodontal disease progression and tooth loss [8].

Bashutski et al. published the results of a long-term clinical study where the correlation between the quantity of vitamin D in blood plasma and periodontal surgeries was studied. Researchers determined that research subjects with a vitamin D deficiency in blood plasma showed less effective results (lower tissue attachment level and probing depth change) after periodontal surgery [9]. The authors argue that to improve post-surgery results, it is advised to examine vitamin D level in the patients' blood prior to the treatment and avoid vitamin D deficiency by taking supplements.

Alshouibi et al. studied the correlation between the quantity of vitamin D and state of periodontium in 562 older men [10]. Study results showed that subjects who received more than 800 IU of vitamin D daily had a lower risk of having a more severe form of chronic periodontitis (results were based on probing depth, attachment level, loss of alveolar bone), whereas those receiving less than 400 IU of vitamin D suffered from a more advanced level of alveolar bone resorption [11].

CONCLUSION:

It is concluded that the levels of DBP increased significantly along with the severity of periodontal destruction and may be used as a biomarker to complement the diagnosis of periodontitis in early as well as late stages.

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