RELATIONSHIP BETWEEN CHRONIC PERIODONTITIS AND VITAMIN D DEFICIENCY

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ABSTRACT

Periodontitis is an inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms resulting in the progressive destruction of the periodontium caused by the inflammatory response of the host. Vitamin D plays an essential role in bone maintenance and immunity, and it is thought that vitamin D deficiency could negatively affect periodontal health. Previous research on vitamin D and tooth loss has been limited. The paper aims to present a possible connection between vitamin D deficiency and periodontal disease through a case report. In conclusion, it is stated that there is still conflicting evidence regarding the effects of 25(OH)D on the severity, progression and loss of teeth during periodontal disease. Limited evidence also supports a positive association between 1,25(OH)2D and periodontal health, as well as a trend towards better periodontal health with vitamin D supplementation being in agreement with our findings.

Keywords: periodontal disease, vitamin D, alveolar bone resorption, vitamin D supplementation

Introduction

Periodontitis is an inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms resulting in progressive destruction of the periodontium caused by the inflammatory response of the host (1). Vitamin D plays an essential role in bone maintenance and immunity, and it is thought that vitamin D deficiency could negatively affect periodontal health. It has been hypothesized that vitamin D status could change the risk of periodontal disease (2,3,4).

In addition to its role in calcium homeostasis, the biologically active form of vitamin D, 1,25(OH)2D, has proven to be a powerful immunomodulator due to its anti-inflammatory effect through the inhibition of cytokine production in immune cells. It also stimulates monocytes or macrophages to secrete peptides with strong antibiotic activity. These are the reasons why they can be useful for the treatment of periodontal diseases. The diagnosis of vitamin D deficiency is made by analyzing the level of 25(OH)D in the serum. Normal range of serum 25(OH) D is 20–74ng/ml (5).

Previous research on vitamin D and tooth loss has been limited. Recent studies examining this relationship suggest that adequate vitamin D status may prevent tooth loss. Vitamin D is thought to reduce the risk of tooth loss through its effects on bone health, inflammation and the immune response (6).

The paper aims to present a possible connection between vitamin D deficiency and periodontal disease through a case report.

Case report

Patient S.Ć. 45 years old, came to the Clinic for Oral Medicine and Periodontology on the recommendation of her dentist. It is known from the medical history that she has a low level of vitamin D, but other etiological factors are not mentioned. Oral hygiene was satisfactory. Clinical examination revealed bleeding on probing and the presence of true periodontal pockets up to 4 mm deep, while the Plaque index was 0, as well as the Calculus Index.

After the clinical examination, an orthopantomogram was taken, where the loss of the alveolar bone is observed, according to the type of horizontal resorption indicating chronic periodontitis (figure 1.).

Figure 1. Orthopantomogram of the patient

Given that the patient is systemically healthy and without hormonal imbalance, after the clinical examination, X-ray analysis and vitamin D laboratory findings, periodontal therapy - subgingival curettage was recommended. The therapy is carried out under local anesthesia in all four quadrants. The patient is advised to supplement with 2000 IJ of Vitamin D once a day for 6 months.

At the follow-up examination 3 months after the periodontal treatment, the probing depth was reduced to no more than 2 mm, and the vitamin D level was within the normal range. A regular periodontological control examination in 3 months is suggested, as well as a vitamin D control.

Discussion

It is believed that vitamin D can influence the development of periodontal disease, caries and tooth loss. Vitamin D's essential role in calcium homeostasis, along with its anti-inflammatory and antimicrobial properties, may protect alveolar bone loss and subsequent tooth loss (7,8,9).

Searching through the literature, we did not find significant well-controlled clinical trials of the relationship between vitamin D, calcium and periodontitis where the periodontal disease status of patients was verified and monitored with parameters of vitamin D and calcium values over time (10).

The conclusion of the study conducted by Pavlesen S et al. in a sample of postmenopausal women shows that their data do not support an association between vitamin D status and tooth loss.

No statistically significant association was observed between the reduced value of 25(OH)D vitamin and the frequency of tooth loss due to periodontal disease being in agreement with our report (11).

A study by Antonoglou et al. included 55 subjects with chronic periodontitis and 30 periodontally healthy subjects whose serum levels of 25(OH)D, 1,25(OH)2D, C-reactive protein and high-density lipoprotein cholesterol were determined. The association between vitamin D and the periodontal condition of the study patients was determined using logistic regression analysis. The results showed that a low level of 1,25(OH)2 D in the serum was associated with periodontitis complying with previous knowledge regarding the relationship between the level of 1,25(OH)2 D in the serum and other inflammatory diseases. The authors emphasize that there is a dilemma as to whether this association is causal and it remains to be confirmed in future studies (12).

Conclusion

The available studies state that there is still conflicting evidence on the effects of 25(OH)D on the severity, progression and loss of teeth during periodontal disease. Some studies report beneficial effects of higher serum 25(OH)D concentrations on periodontal health and tooth retention, while others could not find such association. Limited evidence also supports a positive relationship between 1,25(OH)2D and periodontal health, as well as a trend towards better periodontal health with vitamin D supplementation being consistent with our findings.

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