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Effect of Oral Vitamin D₃ on Dental Caries: An In-Vivo and In-Vitro Study

Abstract

Aim:

Vitamin D3 plays an important role in affecting the overall remineralization process of the dentition. The use of supplements help to keep the levels at optimum and thus reduce the chances of treating very early lesion of caries. Hence the aim was to investigate the indirect effects of oral vitamin D3 on microhardness and elemental weight percentage of Calcium (Ca) and Phosphorous (P) in enamel surface with an artificially initiated carious lesion.

Methods:

The 120 extracted premolars were randomly divided into five groups according to salivary immersion. Each group had a total of twenty-four participants, with the following characteristics: control +ve: sound enamel; control -ve: only subjected to pH cycle; A: pH cycle and immersion in control saliva; B: pH cycle and saliva collected after three weeks; and C: pH cycle and saliva collected after six weeks. The unstimulated saliva was collected from (40) adult volunteers receiving vitamin D3 1000IU gel capsules daily for six weeks. Before each vitamin D3 intake, 10 mL of unstimulated control saliva was collected from each participant. Then other 10 ml. were collected after three and six weeks of vitamin D receiving periods. Saliva immersion time (12 hours). Enamel surface was assessed by Vicker's Microhardness machine and (X-ray fluorescence - XRF) spectrometer.

Results:

For all specimens, there was a significant decrease in both (Ca and P weight %) after demineralization and then they significantly increased after receiving vitamin D3. The microhardness and elemental analysis provide confirmed results that were represented as a statistically significant difference at ($P \leq 0.05$) between groups that received vitamin D3 and those without vitamin D3 dosage.

Conclusions:

Oral vitamin D3 has a significant potential in motivating remineralization of early lesions on the enamel surfaces representing improved surface microhardness and minerals content (Ca and P weight %) of demineralized tooth surfaces.