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The Relationship Between Dental Caries Damage, Tooth Enamel Hypoplasia and the Particularities of Calcium Homeostasis in Children

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Abstract

The aim of the present research was to study the relationship between dental caries (DC), enamel hypoplasia (EH) and markers of calcium homeostasis in children. The level of vitamin D, parathyroid hormone (PTH), calcium (Ca) and phosphates (Pi) in blood serum and oral fluid (OF) was studied in a sample of 246 children aged between 1 and 18 years. Depending on the state of oral health, the children were divided into 3 identical groups according to structure. The research group L1 consisted of 82 children with EH, the research group L2 included 82 children with DC, and the control group L0 – 82 conventionally healthy children, free of caries and without clinical manifestations of EH. As a result of the study, vitamin D deficiency, increased PTH level in blood serum and decreased Ca/Pi ratio in OF were established. Conclusions: vitamin D3 deficiency and increased PTH production can be used as markers of EH formation, increased susceptibility to DC and rampant DC development. The decrease of the Ca/Pi ratio in OF below 1:1.2 is a prognostic factor of the very rapid evolution of DC, caused by the disturbance of the tooth enamel remineralization process. The detection of some important risk factors for EH and the rampant evolution of DC requires the performance of interdisciplinary studies and the complex approach in planning measures to prevent DC and EH, which should include, in addition to local methods of prophylaxis, the administration of medication to balance Ca homeostasis at the local level and systemic.

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Keywords: dental caries, enamel hypoplasia, calcium homeostasis, vitamin D3, parathyroid hormone

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