

INFLUENCE OF COMPLEX TREATMENT ON AMINO ACID COMPOSITION OF SALIVA IN CHILDREN WITH EROSION OF DENTAL TISSUES

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Akhmedov A. B.*Tashkent State Dental Institute***Abstract:**

The application of pathogenetic treatments to young children with dental hard tissue has not been sufficiently studied. In this article, the influence of complex treatment on amino acid composition of saliva in children with erosion of dental tissues is elucidated.

Key words:

Amino acid, pathogenic treatments, mineralization, tooth enamel, erosion of dental tissues.

Till now the provision of outpatient dental care in young children with dental hard tissue with instrumental technologies, the application of pathogenetic treatments to them has not been sufficiently studied. There is a problem of developing and improving algorithms for pathogenetic treatment of preschool children, minimizing the risk of complications of the underlying disease. It is known that dental hard tissue erosion is not only related to exogenous and endogenous factors, but also to dental tissue developmental disorders and is hereditary. At the heart of the pathology lies a change in the composition of the enamel and its insufficient mineralization. The general approach to the treatment of children in this contingent should be to fully understand the genesis of resistance and durability of tooth enamel, as well as to identify all the individual factors in the development of the erosive process.

Tooth enamel is a bioceramic material with a complex composition and is the hardest tissue in the human body. Unlike other hard tissues in the body, enamel does not have a cellular structure. Although the enamel does not preserve the cell and is not capable of regeneration, it undergoes constant metabolic processes. Enamel enters ions through saliva, as well as dentin from tooth pulp. The content of organic matter in mature enamel is 1.2-2.0%. The organic matrix is composed of small amounts of carbohydrates and lipids, as well as proteins specific to this tissue. They are located between the apatite crystals in the form of tufts, plates or spirals. Enamel protein is composed of enamelin and amelogenins in a 1:1 ratio, forming a thin network in the formed permanent teeth. In addition to these proteins, certain free amino acids (glycine, valine, proline, histidine, lysine and arginine) and peptides are detected in the enamel.¹

In our study, we aimed to study the amino acid composition of blood and oral fluid in children aged 2 to 6 years with dental hard tissue erosion, which is necessary to study the organic components of enamel, because proteins are the matrix of the mineralization process and its active participant. The growth, regeneration, and other properties of hard tissue are related to proteins. Decreased protein synthesis leads to disruption of the mineralization process. In this regard, our study involves the study of the amino acid composition of blood and oral fluid. To achieve our goal, the amino acids in the studied samples were isolated on a liquid chromatograph using the reverse phase chromatography (RPC) method.

Material and methods.

Isolation of free amino acids. Precipitation of proteins and peptides of the aqueous extract in centrifuge beakers. For this, 1 ml (exact volume) of 20% TCA was added to 1 ml of the test sample. After 10 minutes, the precipitate was separated by centrifugation at 8000 rpm for 15 minutes. Separating 0.1 ml of the sedimentary liquid, it was freeze-dried.

HPLC analysis of FTC-derivatives of amino acids. The synthesis of FTC derivatives of free amino acids was carried out according to the method of Steven A., Cohen Daviel.

The identification of FTC amino acids is carried out on an Agilent Technologies 1200 chromatograph on a 75x4.6 mm Discovery HS C18 column. Solution A: 0.14M CH₃COONa + 0.05% TEA pH 6.4, B: CH₃CN. Flow rate 1.2 ml / min, absorption 269nm. Gradient % B / min: 1-6% / 0-2.5min; 6-30% / 2.51-40min; 30-60% / 40.1-45min; 60-60% / 45.1-50min; 60-0% / 50.1-55min.

Adoamin is recommended as a complex treatment amino acid complex.

Results.

Analysis of the composition of free amino acids in saliva in children with erosions of dental hard tissues showed significant fluctuations in the concentration of amino acids in some patients. Pre-treatment results show that irreplaceable glycine ($2,34 \pm 0,18$ in healthy children, $1,52 \pm 0,16$ in children with erosion), valine ($3,29 \pm 0,31$ and $2,68 \pm 0,27$ respectively), proline ($2,45 \pm 0,19$ and $2,04 \pm 0,18$ respectively) and replaceable histidine ($2,74 \pm 0,18$ and $2,01 \pm 0,16$ respectively), lysine (respectively $1,82 \pm 0,15$ and $1,35 \pm 0,11$), arginine ($1,86 \pm 0,19$ and $1,17 \pm 0,13$ respectively) amino acids were significantly reduced in the oral fluid.

Glycine ($1,53 \pm 0,18$ in the comparison group, $1,98 \pm 0,16$ in the main group), valine ($2,73 \pm 0,31$ and $2,97 \pm 0,27$ respectively) in the amino acid content of oral fluid in the background of complex treatment of children with dental hard tissue erosion, proline ($2,04 \pm 0,19$ and $2,31 \pm 0,18$ respectively) and interchangeable histidine ($2,01 \pm 0,16$ and $2,72 \pm 0,18$ respectively), lysine ($1,65 \pm 0,11$ and $1,78 \pm 0,15$ respectively), arginine ($1,37 \pm 0,13$ and $1,83 \pm 0,19$ respectively) in healthy group indicators in the main group of patients. In contrast, no changes in performance were observed in the comparison group in which only local treatment was used.²

Conclusion.

Prevention of dental hard tissue erosion in children endogenous path is appropriate, at this age the pulp - dentin - enamel pathway plays a key role in relation to the teeth in which metabolic processes are formed. Endogenous prophylaxis of erosive disease of the teeth is crucial when permanent teeth are in the jaw during the period of active growth from 2 to 6 years of age. For the complete formation of hydroxyapatites, the metabolism of calcium, phosphorus and amino acids in the blood serum must be normal.

It should be noted that a comparative study of amino acids and proteins of the oral cavity and serum in children with erosive damage to the hard tissues of the teeth showed statistically significant differences. In our view, a decrease in protein synthesis and changes in amino acid balance, in particular - histidine, glycine, glutamic and aspartic acids, valine, proline, arginine, alanine, phenylalanine, leucine, lysine and cysteine - lead to disruption of protein synthesis and mineralization processes. under the influence of external and internal factors leads to erosive damage to the hard tissue of the teeth.

Literature.

1. Vavilova T. P. Biohimija tkanej i zhidkostej polosti rta : uchebnoe posobie Vavilova T. P. – 2-e izdanie. – Moskva : GJeOTAR-Media, 2011. – p. 208.
2. Ishanova M.K., Akhmedov A.B., Kodirova M.T., Dushmanamedov E.KH., Utesheva I.Z., Yakubova F.KH. Estimation of the diagnostic value of amino acid composition of oral fluid and blood serum in children with dental erosion and their effectiveness of pathogenetic treatment // International Journal of Pharmaceutical Research. 2021. – Vol 13. Issue 1. pp. 3155-3161.