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## PRINCIPLES OF PREVENTION AND TREATMENT OF CALCIUM DEFICIENCY CONDITIONS IN ADOLESCENTS

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### ANNOTATSIYA

Maqolada so‘nggi 10-15 yil ichida kaltsiy etishmovchiligi va ularning o‘smirlik davridagi asoratlari bo‘yicha tadqiqotlar bo‘yicha adabiyotlarni ko‘rib chiqish ma‘lumotlari keltirilgan. Tadqiqot natijalari kaltsiy va D3 vitamini etishmovchiligi bo‘lgan bolalar va o‘smirlarda qattiq tish to‘qimalarining kasalliklarining yuqori tarqalishini ko‘rsatadi.

**Kalit so‘zlar:** tish karieslari, o‘smirlar organizmi o‘sishi, xavf omillari, davolash va profilaktika choralari.

### АННОТАЦИЯ

В статье приведены данные обзора литературы за последние 10 – 15 лет, посвященные исследованиям кальция дефицитных состояний и их осложнениям у детей подросткового возраста. Результаты исследований показывают высокую распространенность заболеваний твердых тканей зубов у детей и подростков с дефицитом кальция и витамина Д3.

**Ключевые слова:** Кариес зубов, подростковые перестройки организма, факторы риска, лечебно - профилактические мероприятия.

## ABSTRACT

The article presents data from a review of literature over the past 10 to 15 years devoted to studies of calcium deficiency conditions and their complications in adolescent children. The results of the studies show a high prevalence of diseases of the hard tissues of the teeth in children and adolescents with a deficiency of calcium and vitamin D<sub>3</sub>.

**Keywords:** Dental caries, adolescent body changes, risk factors, therapeutic and preventive measures.

## INTRODUCTION

In the transition period, there is a restructuring of the personality and the human body. Problems with changing character and behavior are complicated by problems with appearance: skin, hair and, of course, teeth. One of the urgent and priority tasks of pediatric dentistry is still the problem of prevention and treatment of dental caries in children and adolescents. The high prevalence and intensity of caries of permanent teeth in children and adolescents and the insufficient effectiveness of ways to prevent it determine the practical significance of this issue (Kamalova M.K. 2020).

Physiologically, adolescence or puberty correlates with puberty and on average begins at 11-12 years of age in girls, at 12-13 years of age in boys and lasts until 16-17 years. There are significant hormonal changes in both girls and boys. Growth hormones, sex hormones, thyroid hormones are activated. This gives an impetus to changes in the whole body. Puberty begins, secondary sexual characteristics develop. During adolescence, there is a peak in the growth rate, when children can grow by 5-6 cm and by the size of their legs in just a few months. During this period, there is a high risk of developing posture disorders and scoliosis, since the period of growth and changes in bone tissue coincides with the period of intense school load.

Puberty adolescents living in Bukhara have a high incidence of caries (84-97%), significantly exceeding the average for this age group in Uzbekistan as a whole. The greatest increase in the intensity of caries is observed from 12 to 15 years. The mineralization of the enamel of permanent teeth continues for 5 years after eruption and has a wave-like character (Tailakova D.I. 2020). Studies by Tailakova D.I. (2020) show an active accumulation of calcium and phosphates in all layers and on all surfaces of the crown occurs during the 1st year, as well as in 4-5 years, only in the surface layers of fissures. At 2-3 years after eruption (12-13 years), there is a significant decrease in the rate of enamel mineralization. 70% of adolescents aged 12-13 years have unsatisfactory hygienic oral care and low (no more than 30%) effectiveness of

single hygiene lessons, which requires systematic training and monitoring classes at least. 62% of the examined children aged 12-13 years have a large number of foci of demineralization (initial caries), typical localizations of which are areas of plaque accumulation and hypomineralized areas of the tooth, as well as low saliva mineralizing potential. A similar picture characterizes a pronounced cariesogenic situation in the oral cavity in adolescents of puberty. Also revealed in the results of studies (Daminova Sh.B., Kazakova N.N., Abdullaev Zh.R. 2020) course endogenous intake of vitamin and mineral preparation "Calcemin" against the background of local caries stabilizing measures significantly accelerates the rate of mineral "maturation" of tooth enamel during the first two years after their eruption (on average, by 40%, in comparison with the control), contributes to a significant increase in the mineralizing potential of saliva by stabilizing the interfacial composition of calcium, and, consequently, increases the structural and functional resistance of enamel at the stage of.

A large number of publications on the use of various methods and means of caries prevention in children are available in domestic and foreign literature. Most of the literature data indicate the preventive effect of fluoride preparations, the need for hygienic training and education, the importance of a proper diet, etc. (Bokaya V.G., 2012; Kuzmina E.M., 2011). However, most of the works are devoted to children of primary school age (Elizarova V.M., Petrovich Yu.A., 2007), which does not give an idea of the state of this issue in adolescents. The available single works on the use of complex anti-cariou techniques in schoolchildren aged 11-15 (Fesseler A., 2014; Horowitz H.S., 2010; Hall A.F. et al., 2009) do not reflect a complete understanding of the possibilities, and sometimes the need to continue preventive measures in children of this age group, whereas adolescence it is characterized by the presence of specific risk factors that.

This age period is characterized by the presence in the oral cavity of a large number of permanent teeth with incomplete mineralization, because it is from (9) 10 years to 14 years that the eruption of canines, first and second premolars, as well as second molars occurs (Ivanova G.G. et al., 2010). According to T.G. Petrova (2012), girls 7-9 years old and boys 9-12 years old have the lowest level of resistance to caries. Additional risk factors can be considered as earlier and later, compared with the average, the timing of teething (Silverstone L.M. et al., 2008; Bartsch N., Bauch J., 2012; Hellwig E., 2005). Especially unfavorably prolonged eruption periods are manifested in relation to caries lesions of the second molars (Buttner M., 2009; Einwag J. et al., 2008). The rapid development of caries in such teeth is explained by morphological immaturity and hypomineralization of hard tissues (Udovitskaya E.V.,

Parpaley E.A., 2009; Vierling P., Huftlein U., Dunniger P., 2008), as well as less. This can lead to a violation of the enamel maturation process, since the presence of plaque prevents the entry of macro- and microelements from the oral fluid into the hard tissues of the tooth (Lukinykh L.M., 2009); and in addition, the resulting plaque with pathogenic microflora present in it can contribute to the progressive demineralization of "immature" enamel (Binus W. et al., 2011).

Adolescence coincides with puberty, which is characterized by physiological hormonal restructuring affecting all metabolic processes, including mineral (Kotova S.M., Karlova N.A., 2010). According to M. Buttner (2010), this period in girls falls at the age of 11-13 years, and in boys - at 12-14 years.

Changes and shifts in hormone concentrations affect the mechanisms of calcium homeostasis, intraosseous metabolism, bone formation and mineralization of hard tissues of teeth (Berman R.E., Vaughan V.K., 2014; Shcheplyagina JI.A. et al., 2013). The critical period for the growth and mineral maturation of the skeleton is the prepubertal period (Kotova S.M., Karlova N.A., Maksimtseva I.M., Zhorina O.M., 2012). The discrepancy between the increase in height and the increase in bone mass explains the increased fragility of bones and the low resistance of the hard tissues of teeth that erupted at this age. Skeletal formation and mineralization of teeth is a very dynamic process that requires a sufficient amount of plastic material and a perfect system for regulating bone metabolism, which is closely related to calcium metabolism. Therefore, the active course of dental caries, along with the steady increase in the incidence of the musculoskeletal system and the frequency of traumatic bone injuries in adolescents is one of the manifestations of a lack of calcium and / or a violation of its metabolism. However, for effective absorption and deposition of calcium by bone tissue and hard tissues of teeth, vitamin D3 is necessary - one of the main regulatory mechanisms of calcium homeostasis (Newman A., Newman M., 2014; Zvartau E.E. et al., 2011). In addition, a number of authors point to their own anticaries activity of vitamin D3 (Borovsky E.V., JTeyc P.A., 2009). It has been experimentally proved that vitamin D3 deficiency not only hinders the deposition of calcium by the hard tissues of the teeth, but also causes an increase in the volume of the organic matrix of dentin, due to a violation of its mineralization, a delay in the development and formation of enamel, leading to hypoplastic changes in it (Murray J. Favus, 2009).

Therefore, one of the most important areas of optimization of mineral metabolism, which affects the construction of resistant tissues, is the use of drugs that affect the body as a whole, and through it on the dental system. Such schemes, including calcium preparations, have been developed mainly for young children and are aimed at increasing the nonspecific resistance of the body (Fedorov Yu.A., Koshovskaya

V.A.2009). However, the effectiveness of anti-cariou measures requires a differentiated approach to different age groups of children in need of different volume, orientation and intensity of caries prophylactic measures. During puberty, the administration of calcium and vitamin D3 preparations is necessary to fill the increased needs of a growing organism in plastic material during the period of intensive growth and mineral "maturation" of the skeleton and tooth enamel. Despite the existence of works on this issue in pediatric practice (Berman R.E., Vaughan V.K., 2012; Zazulevskaya L.Ya., Klimova S.V., 2014; Kotova S.M. et al., 2015; Shcheplyagina JI.A. et al., 2013), the combined use of calcium carbonate in combination with vitamin D3 as endogenous prevention of caries has not been studied in dentistry during the period of intensive growth.

Thus, the creation of a scheme of a comprehensive program for the prevention of dental caries in conditions of mass school admission for adolescents of puberty, including both methods of local fluoride prevention and endogenous administration of combined medicines containing calcium and vitamin D3, will be very relevant for clinical pediatric dental practice. For this purpose, the vitamin and mineral preparation "Calcemin" (Bayer, USA) is used, one tablet of which contains calcium (calcium citrate and calcium carbonate) 250 mg, Vitamin D3 50 ME, zinc (zinc oxide) 2 mg, copper (copper oxide) 0.5 mg, manganese (manganese sulfate) 0.5 mg, boron (sodium borate) 50 mcg. The choice of this particular calcium preparation is justified by the wide use and large volume of clinical trials in pediatrics, pediatric traumatology and endocrinology, proving its clinical safety when prescribed to children from the age of 6 (Kotova S.M., Karlova N.A., Maksimtseva I.M., Zhorina O.M., 2012, Yarieva O.O., 2021). The available single works on the use of complex anti-cariou techniques in schoolchildren aged 11-15 (Fesseler A., 2014; Horowitz H.S., 2010; Hall A.F. et al., 2009) do not reflect a complete understanding of the possibilities, and sometimes the need to continue preventive measures in children of this age group, whereas adolescence it is characterized by the presence of specific risk factors that can contribute to the development of carious disease. This dictates the need for further scientific work with diseases of the hard tissues of the teeth in adolescent children.

## CONCLUSIONS

For the age group of schoolchildren aged 12-15 years, it is necessary to conduct systematic training and monitoring classes on oral hygiene using illustrative manuals and visual demonstration models at least once every 6 months.

In order to prevent dental caries in adolescents with high enamel resistance, the following regimen of taking the drug "Calcemin" is recommended: 25-30 days 2 times

a year (spring-autumn); in order to stabilize the carious process in children with sub- and decompensated caries - 25-30 days 3-4 times a year until the completion of mineralization of the hard tissues of the teeth (up to 15 years old). When prescribing the drug "Calcemin" in a complex of anti-carious measures during puberty, it is necessary to take into account the degree of activity of the carious process, the age and gender of the teenager. Taking the drug requires approval from a pediatrician.

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