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# STUDYING THE INTERRELATION OF HYPO AND HYPERCALCIMIA OF THE MATTER ON THE DEVELOPMENT OF TEETH IN EARLY POSTNATAL ONTOGENESIS.

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**Abstract:** This article presents a literature review on the study of calcium metabolism in pregnant women on the development of the teeth of future descendants. In recent years, there has been a great interest in the study of the influencing factors during the period of antenatal development of the fetus on the formation of odontogenesis. Of great interest is calcium metabolism in the mother-placenta-fetus system. Calcium is necessary for the full functioning of the entire body of the fetus, and calcium is also needed in sufficient quantities by the growing fetus for both bone growth and tooth development.

**Keywords:** Odontogenesis, calcitriol, vitamin D3, hypocalcemia, hypercalcemia.

It is important to remember that during fetal development, the formation of the dentoalveolar system occurs. The process begins at the stage of 5-6 weeks of fetal development with the appearance of the primary oral cavity, which at the 2nd month of pregnancy is divided into lips, cheeks and teeth.

Separation from the oral cavity begins during the period of tooth development and is divided into three periods:

1 period (8 weeks) - the laying and formation of the rudiments of milk teeth occurs;
2 period (up to 3 months) - cells appear, which are the building material for enamel, dentin and pulp of milk teeth;
3rd period (from 4 months) - the construction of enamel, dentin and dental pulp begins.

Permanent teeth develop in the same way as milk teeth, starting from the 5th month of pregnancy. By the time of the birth of a child, each jaw contains 10 milk and 8 permanent teeth.

As T.F. Vinogradova wrote in her scientific works, in modern dentistry, several stages of growth and development of teeth and the corresponding dates for laying teeth, differentiation and calcification of dental tissues, eruption of temporary and permanent teeth, and formation of roots are known. distinguishes three periods of growth and development of permanent teeth: inside the jaw formation, eruption, root growth and periodontal formation. T. F. Vinogradova singles out teething as a separate period. Numerous studies are devoted to this period of growth and development of teeth as visually controlled and available for clinical observation. The study was reduced mainly to ascertaining the timeliness of teething, parity, symmetry

of their appearance in the oral cavity, as well as identifying malformations of teeth, anomalies in the position of teeth and bite. [one]

Teething is a complex process that has no analogues in other body systems, when the growth and development of an organ occurs inside another tissue. The movement of the tooth to the alveolar margin, overcoming the barriers of bone tissue and mucous membrane and its appearance in the oral cavity is considered a process that is difficult to explain. Therefore, such theories of teething as root [2], alveolar [3], pulpal [4], and bone tissue reconstruction [5, 6, 7, 8, 9] were created and until recently remained in the educational literature. Each of the authors presents his own concept of the predominant mechanical force that can move the tooth into the oral cavity.

Anomalies in the development of the dentoalveolar system are a symptom of a violation of the development of the whole organism, for example, hormonal discordance or a genetically determined anomaly in the development of the human skeleton, as well as a violation of the metabolism of macro and microelements. The occurrence of a pathology of the size and shape of the jaws is observed with hereditary predisposition and congenital anomalies of the maxillofacial region (congenital cleft lip, alveolar process and palate, hemifacial microsomia, Robin and Goldenhar syndrome, etc.), developmental disorders of the temporomandibular joints, jaw injuries with lesions growth zones, as well as after rickets and diseases associated with metabolic disorders and, in particular, calcium metabolism and endocrinopathies [1 0,11,12,13].

During pregnancy, the need for macro- and microelements increases. It is traditionally believed that calcium is a building material for the formation of the skeleton of the fetus and the development of teeth. [fourteen]. Therefore, providing pregnant women with calcium is the subject of close attention of obstetricians from different countries.

Calcium is an integral component of the body's calcium-phosphorus homeostasis, which is regulated by the parathyroid gland, vitamin D3 in its biologically active form - calcitriol, and is necessary for bone ossification and tooth development. These effects of calcium are mediated by the Ca-binding proteins (osteocalcin, cadherins, calretinin, calreticulin, calbindin), the Ca-regulating hormone calcitonin (which acts opposite to parathyroid hormone).

The main indicators of the calcium content in the body of a pregnant woman are the content of Ca2+ ions in the blood serum and urine, which makes it possible to register the presence of hypocalcemia and hypercalcemia in patients. The main mechanism for the regulation of calcium metabolism is cellular Ca-channels that maintain calcium flow in the cells of all organs and tissues. Serum calcium levels are controlled by the Ca-sensitive receptor CASR

The biological effect of calcium is determined by the amount of calcium not bound to proteins, and not by total calcium, so hypocalcemia is diagnosed precisely when the levels of unbound calcium fall below normal. Pathophysiologically, hypocalcemia is associated with impaired parathyroid function, lack of vitamin D3 in

the diet, lack of sufficient ultraviolet radiation, or impaired renal function. Low levels of vitamin D3 in the body can lead to a lack of calcium absorption and secondary hyperparathyroidism (hypocalcemia and elevated parathyroid hormone levels) [ 15].

In accordance with the recommendations of the World Health Organization (WHO), pregnant women are recommended to take 1200 mg/day of elemental calcium [16], no later than from the 20th week of physiological pregnancy until delivery.

A prospective study of 1210 mother-child couples in Japan showed that after children reached the age of 3–4 years, the risk of caries was reduced if the mother received sufficient vitamin D3 during pregnancy. Conversely, with a low supply of vitamin D3, the risk of caries in children increased by 47% [17].

A large-scale study conducted in Russia showed that lower levels of 25-(OH)-D3 in the blood are associated with periodontitis (periodontitis - 10.93±3.3 ng/ml, control group - 19.86±7.1 ng/ml ; p=0.011), incisor injuries (injury - 13.59±6.41 ng/ml, comparison group - 21.71±7.29 ng/ml; p=0.008) and gum bleeding (yes - 14.97± 6.46 ng/ml, no - 20.73±7.05 ng/ml; p=0.056). In addition, a relationship was established between a reduced level of vitamin D3 and rapid muscle fatigue (fatigue - 14.33±4.31 ng/ml, control - 20.08±7.92 ng/ml; p=0.065). These associations are quite understandable, since vitamin D3 is the central factor of calcium metabolism, which is not only responsible for the formation of the structure of the dentin of the teeth, but also maintains the physiological muscle tone [18].

**Conclusion:** Calcium is an integral component of the body's calcium homeostasis, which is regulated by the parathyroid gland and vitamin D3. reducing the risk of developing dental pathology. Significant changes in the level of calcium in the blood in the maternal body can lead to significant changes in the endocrine regulation of calcium metabolism in the fetus. In addition, a violation of calcium metabolism in the mother's body during pregnancy can have a significant impact on the risk of developing dental pathology. in offspring in postnatal ontogenesis. Thus, the number of dentoalveolar anomalies is growing every year. Therefore, we chose to conduct an experiment with one of the possible reasons that could be one of the main factors in the appearance of dentoalveolar anomalies - this is the mother's calcium metabolism, since calcium is one of the important elements in the odontogenesis of the unborn baby.

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