



The State of Calcium Metabolism in Dental Diseases in Children with Artificial Feeding

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Abstract: Natural feeding has a biological advantage over artificial feeding and ensures the proper and full development of the child. The development of the doctrine of natural feeding went in parallel with the intensive search for ways to abandon it. Artificial formula feeding has become so simple and safe that the problem of breastfeeding has ceased to exist, and this has been one of the reasons for the catastrophic decline in the duration and prevalence of breastfeeding in most developed countries. In this regard, the scientific substantiation of new approaches to breastfeeding support is of particular importance, an important place among which is occupied by programs aimed at eliminating risk factors for early transfer of children to artificial feeding. The absence or insufficient breastfeeding can lead to the development of dysbiosis, contribute to the occurrence of periodontal and dental diseases, negatively affect the digestive processes.

Keywords: Diseases, children.

Introduction: Natural feeding has a biological advantage over artificial feeding and ensures the proper and full development of the child. The development of the doctrine of natural feeding went in parallel with the intensive search for ways to abandon it. Artificial formula feeding has become so simple and safe that the problem of breastfeeding has ceased to exist, and this has been one of the reasons for the catastrophic decline in the duration and prevalence of breastfeeding in most developed countries. In this regard, the scientific substantiation of new approaches to breastfeeding support is of particular importance, an important place among which is occupied by programs aimed at eliminating risk factors for early transfer of children to artificial feeding. The absence or insufficient breastfeeding can lead to the development of dysbiosis, contribute to the occurrence of periodontal and dental diseases, negatively affect the digestive processes.

It is known that parathyroid hormone (PTH) is a peptide hormone that is produced in the parathyroid glands. It regulates the exchange of calcium and phosphorus, while providing the optimal amount of calcium ions in the blood. PTH also regulates the processes of calcium release from bones, absorption of calcium from the intestine and removal of calcium from the body with urine. If the amount of calcium in the blood decreases, then parathyroid hormone is additionally produced, which returns balance. PTH induces vitamin D synthesis [1.3.5.7.9].

In order to study calcium metabolism in children, the concentrations of serum calcium, parathyroid hormone and vitamin D₃ (25OH) in the blood were studied.

The concentration of total calcium in serum is the main indicator of calcium metabolism. The need for calcium increases significantly during critical periods of the body's development, especially during the period of intensive growth in children, strenuous educational processes in preschool age require additional sources of calcium and mineralization of bone matter also significantly delays serum calcium.

The purpose of the study: Optimization of methods of prevention of dental diseases in children, taking into account the type of feeding at an early age.

Material and methods of research. To study the significance of risk factors for the development of dental diseases in children, depending on the type of feeding in early childhood, a survey and objective dental examination of 1066 preschool children organized in preschool institutions of the Bukhara region were conducted. To study the biochemical status, the sick children were divided into 3 groups:

1. control group - 30 healthy children;
2. the main group – 70 children who were on artificial and mixed feeding;
3. comparative group – 70 children who were naturally fed.

The parameters of calcium metabolism in the blood (parathyroid hormone, serum calcium, vitamin B3 (25ON)) were studied in all selected children.

The criteria for inclusion in the study were preschool children aged 3 to 7 years, who had acquired diseases of the dental system and were on natural or artificial feeding.

The exclusion criteria were: injuries and congenital pathologies of the maxillofacial region and other endocrine diseases.

In the study, hypocalcemia was observed in patients with dental diseases with artificial and mixed feeding in early childhood - 1.96 ± 0.02 mmol/l ($P < 0.01$). The result obtained is 1.14 times less than the indicators of the control group 2.23 ± 0.07 mol/l (Table 1).

Table 1. Indicators of calcium metabolism in children with artificial and mixed feeding in early childhood

Indicator	1st control group n=60	2 –group (artificial and mixed feeding) n=120
Blood serum calcium (mmol/L)	$2,23 \pm 0,07$	$1,96 \pm 0,02^*$
Parathyroid hormone (pg/ml)	$54,8 \pm 2,9$	$74,5 \pm 1,29^*$
Vitamin B3 (25ON) (ng/ml)	$40,7 \pm 3,3$	$27,9 \pm 0,71^*$

Note: * - differences in relation to the data of the control group are significant

(* - $P < 0.05$, ** - $P < 0.01$, *** - $P < 0.001$)

The study of the concentration of parathyroid hormone at the same time showed a sharp increase in its level to 74.5 ± 1.29 mmol / l, against the control - 54.8 ± 2.9 pg/ ml. The result obtained is 1.35 times lower than the control values and has a statistical significance of $P < 0.05$.

The high concentrations of RTN in our studies are explained by the development of secondary hyperparathyroidism in patients, which is facilitated by diseases of the intestinal tract, in particular changes in the gastrointestinal tract during artificial and mixed feeding, which can form in the form of dysbiosis, constipation, diarrhea, gastrointestinal dysfunction and other gastrointestinal diseases.

At the same time, with prolonged hypocalcemia, a compensatory state is formed, the so-called second hyperparathyroidism. That is, calcium deficiency itself contributes to the development of second hyperparathyroidism, which is confirmed in our studies.

The condition of secondary hyperparathyroidism can also be promoted by vitamin D deficiency. Analysis of the level of vitamin D3 (25OH) revealed its decrease in the blood of children with dental diseases to 27.9 ± 0.71 ng/ml compared with the control group of 40.7 ± 3.3 ng/ml, ($P < 0.05$).

In general, the obtained results of the study of calcium metabolism in children with dental diseases with artificial and mixed feeding in early childhood confirm the relative deficiency of vitamin D3 in children with pathology of the dental and maxillary system. This condition is assessed as a latent calcium deficiency, which does not manifest clinically manifest symptoms of hypocalcemia, but is expressed in insufficient mineralization of bone tissue.

Therefore, when diagnosing stomatological diseases in preschool children, it is very important to take into account the type of feeding in early childhood. All the results show the need to improve preventive dental measures, as well as the development of clinical recommendations for the improvement of sick children with artificial feeding [2.4.6.8.10.12.14.16.18].

A comparative analysis of calcium metabolism indicators depending on the type of nutrition in early childhood in preschool children showed a significant decrease in calcium both against the control and against the indicators of group 2 (Table 2)

Table 2. Indicators of calcium metabolism in preschool children, depending on the type of feeding in early childhood

Indicator	1st control group n=60	2 –group (artificial and mixed feeding) n=120	3-group (natural feeding) n=120
Blood serum calcium (mmol/L)	2,23 ±0,07	1,96 ±0,02*	2,03 ± 0,02*
Parathyroid hormone (pg/ml)	54,8±2,9	74,5±1,29*	60,8±1,0*
Vitamin B3 (25ON) (ng/ml)	40,7±3,3	27,9±0,71*	31,2±0,58*

Note: * - differences relative to the control group data are significant (* - P<0.05, ** - P<0.01, *** - P<0.001)

At the same time, the concentration of calcium in children of group 3 is 1.04 times lower in relation to the indicators of group 2. This confirms the formation of a state of latent calcium deficiency, regardless of the type of nutrition in early childhood.

The concentration of PTH was also reduced to 60.8±1.0 pg/ml against the indicators of group 2. In relation to the control values (54.8± 2.9 pg /ml), it tends to increase to 60.8± 1.0 pg / ml, which shows the compensatory state of the parathyroid hormone, depending on the degree of calcium deficiency in the blood. Consequently, the deeper the calcium deficiency, the higher the concentration of PTH in the blood.

PTH as an inducer of vitamin D synthesis in our studies in children with dental diseases with natural feeding in early childhood was at the level of 31.2 ±0.58 ng/ml in relation to the indicators of the control group-40.7±3.3 ng/ml (P<0.05). The result obtained against the control was significantly lower by 1.3 times. At the same time, a significant increase in the level of PTH was also found against the values of the 2nd group of patients - 27.9± 0.71 ng/ml (P<0.05).

Conclusion. Thus, the obtained results of the study regarding the concentration of calcium and vitamin D show statistical significance both against the control and against the indicators of group 2. And the concentration of parathyroid hormone was significantly increased in relation to the indicators of the 2nd group of patients. Everything obtained shows the state of the compensatory response of the body to calcium deficiency in the blood. Consequently, the importance of the type of feeding in early childhood is high, which has a great contribution to the development of dental diseases in preschool children[11.13.15.17.19].

The state of relative vitamin D3 deficiency in children with pathology of the dental-maxillofacial system is assessed as latent calcium deficiency, which does not manifest clinically manifest symptoms of hypocalcemia, but is expressed in insufficient mineralization of bone tissue, including in the dental-maxillary tissue. All this underlines the importance of taking into account the type of nutrition of children, especially during teething and bite formation.

LIST OF LITERATURE:

1. Галактионова Марина Юрьевна, Измestьева Оксана Владимировна Сроки прорезывания временных зубов и характер вскармливания детей первого года жизни // МиД. 2012. №1.

URL: <https://cyberleninka.ru/article/n/sroki-prorezyvaniya-vremennyh-zubov-i-harakter-vskarmlivaniya-detey-pervogo-goda-zhizni>

2. Safarova M.S., Kamalova F.R. Maktabgacha yoshdagi bolalarda asosiy stomatologik kasalliklarning oldini olish // Scientific progress Issue 6. - 2021. Vol. 2. - P. 1111-1115.
3. Гарифуллина Аьбина Жамильевна, Скрипкина Галина Ивановна, & Бурнашова Таисия Игоревна (2018). Сравнительная Оценка стоматологического здоровья детей школьного возраста г. Омска с помощью Европейских индикаторов. Проблемы стоматологии, 14 (4)
4. Сафарова М.С., Хамитова Ф.А. Непосредственное влияние заболеваний челюстно-лицевой области и зубов на психику и внутренние органы// Тенденции и перспективы развития науки и образования в условиях глобализации. – 2015. - №2 – С. 4-6.
5. Сафарова М. С., Камалова Ф. Р. Профилактика основных стоматологических заболеваний у детей дошкольного возраста //Вопросы науки и образования. – 2021. – №. 25 (150). – С. 14-20.
6. Safarova M. S., Kamalova F. R. МАКТАБГАЧА YOSHDAGI BOLALARDA ASOSIY STOMATOLOGIK KASALLIKLARNING OLDINI OLISH //Scientific progress. – 2021. – Т. 2. – №. 6. – С. 1111-1115.
7. Сафарова М. С. Влияние искусственного вскармливания на развитие челюстно-лицевой области и на организм детей в целом //Интегративная стоматология и челюстно-лицевая хирургия. – 2022. – Т. 1. – №. 1. – С. 91-94.
8. Сафарова М. С., Хамитова Ф. А. Непосредственное влияние заболеваний челюстно-лицевой области и зубов на психику и внутренние органы //Тенденции и перспективы развития науки и образования в условиях глобализации. – 2015. – №. 2-С. – С. 4-6.
9. Axtamovich R. A. Improvement of Treatment and Prevention of Fluorosis in Children of School Age //Middle European Scientific Bulletin. – 2022. – Т. 22. – С. 170-172.
10. Axtamovich R. A. Evaluation of the Results of Primary Cheiloplasty in Children with Congenital Bilateral Cleft Lip and Palate //Middle European Scientific Bulletin. – 2022. – Т. 22. – С. 173-177.
11. Ражабов А. А., Ражабов А. Б. ОЦЕНКА РЕЗУЛЬТАТОВ ПЕРВИЧНОЙ ХЕЙЛОПЛАСТИКИ У ДЕТЕЙ С ВРОЖДЕННОЙ ДВУСТОРОННЕЙ РАСЩЕЛИНОЙ ВЕРХНЕЙ ГУБЫ И НЁБА //Новый день в медицине. – 2019. – №. 3. – С. 214-217.
12. Эронов Ё. К. ANALYSIS FOR DETERMINING THE FEATURES OF LOSHLY-YUSHENKO-KRASNAGORSKY IN CHILDREN CEREBRAL PERSPECTIVE WITH CHARACTERISTICS OF THE STRAIN COMPOSITION //Новый день в медицине. – 2020. – №. 2. – С. 272-274.
13. Эронов Ё. К., Ражабов А. А. ESTIMATING THE PREVALENCE OF CARIES IN CHILDREN WITH CEREBRAL PALSY //Новый день в медицине. – 2020. – №. 2. – С. 634-635.
14. Eronov Y. Q., Mirsalixova F. L. TREATMENT OF CHRONIC CATARRHAL GINGIVITIS IN CHILDREN WITH DISABILITIES IMPROVEMENT //World Bulletin of Social Sciences. – 2021. – Т. 3. – №. 10. – С. 71-74.
15. Eronov Y. Q., Mirsalixova F. L. DIAGNOSIS, PROPHYLAXIS AND TREATMENT OF CHRONIC CATARRHAL GINGIVITIS IN CHILDREN WITH DISABILITIES IMPROVEMENT //World Bulletin of Social Sciences. – 2021. – Т. 3. – №. 10. – С. 67-70.
16. Eronov Y. Q., Mirsalixova F. L. Dynamics of the prevalence of diabetes and the study of dental status in children of the bukhara region //International Journal of Applied Research. – 2019. – Т. 5. – С. 151.

17. Eronov Y. K., Mirsalikhova F. L. Indications for the comprehensive prevention and treatment of dental caries in children with cerebral palsy //Annals of the Romanian Society for Cell Biology. – 2021. – Т. 25. – №. 1. – С. 5705-5713.
18. Eronov Y. Q., Kamalova M. Q. Evaluation of caries prevalence in children with cerebral palsy //Academicia: an international multidisciplinary research journal. – 2020. – Т. 10. – С. 85-87.
19. Эронов Ё., Мирсалихова Ф. ИМКОНИЯТИ ЧЕКЛАНГАН БОЛАЛАРДА СУРИНКАЛИ КАТАРАЛ ГИНГИВИТЛАРНИ ЗАМОНАВИЙ ДАВОЛАШ УСУЛЛАРИ //Медицина и инновации. – 2021. – Т. 1. – №. 4. – С. 681-685.