Breast Milk Micronutrients and Child Health

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ABSTRACT

The World Health Organization expresses concern about the problem of nutrition and micronutrient status of children and their mothers. Given that the nutrition of a nursing mother significantly affects the health of a newborn child through breast milk, increased attention should be paid to the nutrition of women of reproductive age. The article presents convincing data on the importance of individual microelements and vitamins for a growing child. The relevance of studying the micronutrient status of nursing mothers and infants is emphasized.

Keywords: breastfeeding, vitamin D, infant, breast milk, micronutrients

Introduction

Natural feeding is becoming increasingly important today, and attention to breast milk is growing rapidly. It is a source of unique components that ensure healthy growth and development of the future generation. Thanks to mother's milk, the digestive system and intestinal microbiota, immune and anti-infective protection, and the development of the nervous and cardiovascular systems of the child occur. Children who are exclusively breastfed develop better and faster, they are more adapted to environmental conditions, and also demonstrate a more stable psycho-emotional state. After all, breastfeeding is not only nutrition, but also close contact with the mother [1].

Materials And Methods

The long-term prospects of breastfeeding are also known. Such children, as adults, are less likely to develop obesity, type 2 diabetes and cardiovascular pathology. In addition, breastfeeding has a beneficial effect on the health of the mother. Women who breastfeed are less likely to suffer from such ailments as breast, ovarian and uterine cancer [2]. According to WHO, the number of children who are exclusively breastfed is rapidly declining by the age of 6 months, which could not but cause concern on the part of public organizations that emphasize its importance: "Breastfeeding is a unique process that ensures ideal nutrition for young children, their normal growth and development, reduces the frequency and severity of infectious diseases, reduces child mortality, and promotes the social well-being of both the family and the country as a whole. As a global goal to achieve optimal maternal and child health and nutrition, all women should be able to practice breastfeeding for all children from birth to two years of age and beyond" [3].

Results And Discussion

Thus, proper organization of breastfeeding is an important factor among preventive measures aimed at strengthening health and reducing childhood morbidity. The composition of breast milk may change depending on the nature of the mother's diet. Also, its composition, in particular microelement composition, depends on such factors as the environment (soil and water composition), bad habits, the number of pregnancies and the interval between them, the duration of lactation, etc. [2]. Despite this, there is convincing evidence of the relative constancy of the microelement composition of breast milk [4]. Today, there is no doubt that micronutrients play an important role in the vital processes of the human body. Although the content of some microelements is small, their importance is difficult to overestimate. For normal growth and development, optimal functioning of all organs and systems and the course of a number of biochemical processes, not only adequate intake of them with food is necessary, but also the correct ratio. The mechanisms of synergism and antagonism between some microelements are well known, which turns out to be an additional factor in the development of microelementoses. For example, excess phosphorus and iron can disrupt the utilization of calcium and promotes its removal from bone tissue, and excess calcium in turn leads to a deficiency of zinc and phosphorus [2].

The child's body, due to its high rate of development, is most sensitive to changes in homeostasis. Insufficient, as well as excessive, intake of certain micronutrients can lead to the development of pathology, impaired growth and development, and the formation of chronic pathology in adulthood.

The most vulnerable in this regard are the intrauterine period and early childhood. According to studies, insufficient intake of certain microelements during pregnancy can lead to the development of “minor” and “major” fetal malformations [2]. The body of a pregnant woman undergoes a number of changes and requires an increased intake of plastic elements, ensuring the laying down and development of the main vital systems of the fetus. At the same time, about a third of women enter pregnancy already in a deficient state. And the deficiency of such microelements as iron, iodine, selenium, zinc and magnesium appears by the second trimester. This in turn can lead to complications during pregnancy and childbirth, the development of intrauterine pathology of the fetus.

The first year of life is the “foundation” of health, so it is so important to pay great attention to nutrition during this period. Breast milk is an ideal product for a child, and its qualitative and quantitative composition is of great importance. The micronutrient supply of a nursing mother directly affects the amount of them in milk, and therefore the supply of them to the child through breast milk. A child in the first half of life is provided with many microelements and vitamins only through the mother, where their bioavailability is higher than from other food products. It is known that the digestibility of iron from breast milk reaches 50%, and the availability of iodine is directly proportional to that of the mother. There is evidence that adding vitamin and mineral complexes to the diet of nursing mothers increases their content in mature breast milk [2]. However, it is desirable that the maintenance of micronutrient balance in the body of both be achieved through a complete and varied diet of the mother.

Iron, copper, zinc, vitamins A, C, D, E, K, B, and a range of micronutrients are all found in colostrum. These are vitamins and minerals that our bodies cannot make (with the exception of vitamin D, which is synthesized by the skin when exposed to sunlight).

Macronutrients—carbohydrates, proteins, and fats—make up the bulk of breast milk. Of the more than 200 fatty acids present, most are triglycerides, which release energy as they are broken down. In fact, 100 ml of breast milk contains 3–5 g of fat, which is 40–55% of the calories in breast milk.

Breast milk also contains more than 400 different types of proteins. Proteins and other macronutrients are essential for the development of the gastrointestinal tract and act as prebiotics, which help establish a healthy gut microbiome (i.e., all the microorganisms that live in the intestines). This is another factor that increases a child’s ability to fight infection

and maintain a healthy metabolism. Even into adulthood!

The influence of the mother's nutrient status on the health of her child has been repeatedly confirmed in studies. Iron deficiency can cause delayed psychomotor development in children and the development of anemia. Zinc deficiency is associated with low birth weight and symptoms of immaturity, and at an older age - with sensory, emotional and motor development disorders. Low iodine intake causes motor disorders and mental retardation. Deficiency of phosphorus, calcium and vitamin D potentiates the development of rickets and delays in physical and psychomotor development [3]. Vitamin D deficiency is not limited to bone manifestations. Due to the many receptors in the organs and tissues of the body, it can affect the regulation of the immune, cardiovascular, reproductive systems, and carbohydrate metabolism [4].

Conclusion

Thus, the vitamin and mineral status of pregnant and lactating women affects the growth and development of the breastfed child, and therefore determines his health for the rest of his life.

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