

BENEFITS OF BREASTFEEDING FOR MOTHER AND CHILD

Miolski Jelena^{1,2}

¹ Faculty of Medicine, University of Belgrade, Belgrade, Serbia

² Department of Pediatrics with Neonatology, “Stefan Visoki” General Hospital, Smederevska Palanka, Serbia

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Abstract: Breastfeeding is the best way to feed a child from the first six months until the end of the second year. The unbreakable bond during pregnancy between a mother and her child continues during the lactation process, providing numerous benefits for both the mother and the child.

Due to the effects of many hormones after childbirth, lactation offers numerous advantages for the mother. Oxytocin causes reduction of the uterus and bleeding, absence of menstruation, faster return of body weight, lower risk of cancer of the reproductive organs, and prevents the occurrence of osteoporosis and the development of the metabolic syndrome. Breastfeeding certainly ensures a better emotional bond with the child. Specificity in the composition of human milk provides the newborn with short-term and long-term protective effects. Thanks to human oligosaccharides, immunoglobulins, and polyunsaturated fatty acids that influence the composition of the microbiome of the newborn's intestine, as well as the formation of its immune response, breastfed children suffer less from respiratory and digestive infections, food allergies, autoimmune diseases and have been proven to have a higher IQ.

Breastfeeding is the best form of feeding for mother and child. The specificity of the composition of human milk ensures optimal growth and development of the child and a healthier life for its mother.

Keywords: breast milk, breastfeeding, benefits of breastfeeding, mother, oxytocin, human oligosaccharides, newborn.

INTRODUCTION

Numerous international organizations involved in the promotion of breastfeeding give recommendations that mother's milk nutrition is optimal for a child, especially in the first six months of life, and as a supplement until the end of the second year (1-3). All the

nutritional needs of the newborns can be fulfilled with the mother's milk. Its principal role is adequate and optimal growth and development. It is also known to have an imminent role in preventing the development of numerous diseases in the newborn, as well as to participate in the emotional connection between mother and child, **Tables 1** and **2** (4).

Table 1. Benefits of breastfeeding for the mother (5)

Mother's benefits	
1.	Reduction of uterus and bleeding
2.	Reduction of body mass
3.	Postpartum amenorrhea
4.	Absence of stress, relaxation, and calmness of the mother
5.	Absence of depression
6.	Lower incidence of breast cancer
7.	Lower frequency of cancer of reproductive organs (ovaries, uterine endometrium)
8.	Lower risk for osteoporosis
9.	Lower risk of Alzheimer's disease
10.	Lower risk of developing metabolic syndrome
11.	Lower risk of cardiovascular disease
12.	Lower risk of developing rheumatoid arthritis
13.	Lower risk of developing multiple sclerosis

Human milk is a living, biological substance that enables and maintains the unbreakable bond between a mother and her child even after childbirth (6).

To promote and popularize breastfeeding there are numerous recommendations and guides explaining the advantages of breastfeeding for mothers and children. It plays a key role in the early initiation of breastfeeding and its application during the child's stay in the maternity hospital. Great importance is given to

Table 2. *Benefits of breastfeeding for a child (3)*

The benefits of a child are lower risks for	
1.	inflammation of the middle ear
2.	infections of the upper and lower respiratory organs
3.	child's asthma
4.	occurrence of atopic dermatitis
5.	NEC
6.	obesity
7.	celiac disease
8.	type 1 and type 2 diabetes
9.	inflammatory bowel diseases
10.	leukemia (AML)

pediatricians and gynecologists who work in maternity hospitals as educators of mothers and promoters of breastfeeding through their daily practice. It is necessary to acquaint future parents with the advantages of breastfeeding that both mother and child will have, as well as the entire social community (3).

Benefits of breastfeeding for the mother

Oxytocin is a neuropeptide hormone synthesized in the supraoptic and paraventricular nuclei of the hypothalamus. During the breastfeeding process, the stimulation of the breast nipple affects the increased secretion of oxytocin and the production of milk. Under the influence of hormones, the mother will create positive emotions. She has a feeling of happiness and satisfaction, a positive facial expression, stress, and anxiety are reduced, and positive feelings towards the child increase. It is believed that the changes in oxytocin concentrations that accompany the breastfeeding process are actually a protective mechanism in the psychological changes that occur in mothers (7).

The released oxytocin supports the postpartum contractility of the uterus and its faster return to the state before childbirth. There is a decrease in bleeding, which prevents the occurrence of postpartum anemia. High concentrations of oxytocin ensure a higher pain threshold for the mother, preparing her for faster postpartum recovery (5). Two years after giving birth, changes in the brain structure were recorded in women. The postpartum decrease in the volume of the gray matter of the brain represents an additional protective mechanism for the woman, preparing her for motherhood (8).

Breastfeeding is important for maintaining a mother's mental health. The positivity of breastfeeding will influence the establishment of a better cycle of sleep and wakefulness, providing mothers with ad-

equated rest and relaxation. Studies show that breastfeeding reduces the incidence of postpartum depression. If depression does occur, early recognition of the symptoms and seeking professional help will reduce the possibility of early termination of breastfeeding your child (9).

Mothers who exclusively or predominantly breastfed their children compared to those who did not or partially breastfed have a higher chance of continued lactational amenorrhea (10). The absence of menstrual cycles during breastfeeding, interruption of ovulation, and thus protection against possible new pregnancies, can be explained by high concentrations of prolactin (5).

The protective effect of breastfeeding on ovarian and breast cancer is reflected in the suppression of gonadotropin production and lower estrogen concentrations. The cumulative effect of breastfeeding for more than a year significantly affects the reduction of estrogen concentration levels and the suppression of the proliferation and differentiation of cancerous cells. The positive influence of breastfeeding on the occurrence of possible cancerous cell mutations and malignant transfers in the female reproductive organs has also been demonstrated (11).

During pregnancy and the period of lactation, due to a greater need for calcium, increased bone absorption may occur. The daily production of up to 800 ml of milk per day can cause a loss of up to 200 mg of calcium in the mother. Low concentrations of estrogen during lactation inhibit the formation of periosteal bone less, resulting in the formation of denser bone mass. In about a year after the cessation of breastfeeding, thanks to adaptive mechanisms, bone mass is restored, and the protective mechanism for the occurrence of osteoporosis remains for many years (5, 10).

The breastfeeding process requires about 2100 kcal/day, so the weight of the mother, which was accumulated during pregnancy, will be gradually lost during the lactation period. Higher caloric consumption during lactation was proven mainly in mothers with normal weight, but not in obese mothers, who had a BMI > 35 kg/m². Ethnicity, BMI, nutrition, physical activity, and education of mothers are often cited as confounding factors in the correlation between weight loss and breastfeeding (3, 11, 12). Cardiologists suggest that breastfeeding has a protective effect on the development of coronary artery disease. Breastfeeding in the mother can cause changes in fat and sugar metabolism, as well as regulation of blood pressure values. The release of oxytocin during lactation contributes to faster glucose metabolism, which reduces the onset of insulin resistance and type 2 diabetes, as well as the amount of visceral fat (11). The develop-

ment of maternal metabolic syndrome is inversely proportional to the length of lactation. This syndrome is characterized by central obesity, hypertension, insulin resistance, dyslipidemia, and high risks for cardiovascular disease and mortality (5).

The reduction in the onset of Alzheimer's disease in nursing mothers is attributed to the effect of estrogen on receptors located in the brain. A lower risk of developing autoimmune diseases, such as multiple sclerosis, was associated with the length of breastfeeding in mothers. Studies have also shown a lower risk for the development of rheumatoid arthritis unrelated to the length of time mothers are breastfeeding (5).

Benefits of breastfeeding for a child

The composition of human milk includes human oligosaccharides (HMO), which are indigestible carbohydrates. Their composition and amount in milk are influenced by the stage of lactation, environmental factors, and genetic factors. Their role is to establish adequate micro colonization of the intestinal tract of newborns, thereby contributing to the development of the child's immune function. Their special role is reflected in stimulating the growth of Bifidobacteria, which affects the modulation of the immune response of newborns. The better immune system of breastfed children provides a lower risk of upper and lower respiratory tract infections. The protective effect of mother's milk on middle ear infections in the first two years of life has been demonstrated. Studies have also proven that the length of breastfeeding affects the lower severity of respiratory infections, and thus the reduced rate of hospitalization and mortality (11, 13).

The protective role of breastfeeding in the occurrence of diarrhea is especially pronounced during the first six months in exclusively breastfed children. The protective role breastfeeding has on the development of gastrointestinal infections is achieved due to the specificity of the ingredients of human milk, but also due to the avoidance of contamination of dishes during other forms of feeding (11).

Breast milk has a special role in regulating the microbiome of the newborn. The mother's microflora, primarily Bifidobacteria, and Lactobacteria, is transferred into the secreted milk and affects the microflora of the nursing infant. The association between the increase in the incidence of type 1 diabetes in children and the decrease in the amount of Bifidobacteria (*Bifidobacterium longum subsp. infantis* (*B. Infantis*)) in the microbiome of newborns has been shown. Microorganisms from the intestinal flora that form a symbiosis with the enterocytes of the newborn maintain an intact intestinal barrier, break down HMO from breast

milk, stimulate the production of immunoglobulins, and increase the concentration of short-chain fatty acids (SCFA). This interaction of the microbiome and enterocytes maintains an adequate immune barrier in breastfed infants providing them with protection if they are genetically predisposed to type 1 diabetes. Breastfeeding in children can affect the development of an adequate microbiome of the newborn with a predominance of *Bifidobacterium spec.* that would prevent pancreatic beta cell autoimmunity and type 1 diabetes in early childhood (14, 15).

In its latest revised guidelines, the European Academy of Allergy and Clinical Immunology (EAACI) suggested avoiding supplementation with cow's milk formulas in breastfed infants during the first week of life. The recommendations are given to avoid the possibility of later allergy to cow's milk proteins (16). To avoid food allergies in breastfeeding children, mothers are suggested to use potential allergens in their diet during pregnancy and breastfeeding (17). Breastfeeding in the first four months provides protection against the onset of atopic diseases until the end of the child's second year, and protection against asthma until the child's fifth year of life (18).

The pathogenesis of the development of Necrotic Enterocolitis (NEC), although still incompletely investigated, suggests that breastfed infants have been protected thanks to the specificity of the composition of the mother's milk. Immunoglobulin A, growth factors, probiotics, and HMO, with their influence on the immune response, represent protective factors for the integrity of intestinal enterocytes and prevent the development of NEC, especially in premature infants.

Thanks to the components from mother's milk in breastfed premature babies, there is less possibility of developing sepsis and invasive fungal infections, and thus the resulting neurodevelopmental disorders (19).

Breastfeeding will have a protective role in the development of celiac disease in predisposed individuals. It was concluded that the effect of breastfeeding is pronounced if gluten is introduced into the diet while the child is still breastfeeding (20).

Breastfeeding as a way of feeding infants had positive effects on metabolic, anthropometric, and genetic factors. Components of breast milk can influence epigenetic changes in the earliest life of the newborn. They initiate the process of DNA methylation, modify histones, and remodel chromatin, thereby participating in the control of gene expression in metabolic pathways and preventing obesity (21). Numerous studies confirm the positive relationship between breastfeeding and its protective role in the development of obesity during the child's life. Breastfeeding can be a protective factor in the rapid growth of a child during

the first year of life, which will prevent obesity from the second year and later in life (22). It affects the reduction of the prevalence of obesity during the period of adolescence, especially if breastfeeding lasted longer than one year (23). Breastfeeding that lasts at least four months has been suggested as a measure to prevent obesity and numerous chronic diseases, especially type 2 diabetes, in children as well as in their mothers. A positive effect for both was observed in the period from the second to the fifth year after childbirth (24).

Although the recommendations are that you should exclusively breastfeed for at least six months, there is evidence to support that even a shorter duration of breastfeeding can have a positive impact on the cognitive development of the child (25). The positive impact is primarily reflected in the emotional connection between mother and child during the breastfeeding process. The levels of certain hormones of the mother allow her to be calm, relaxed, and more attached to the child. The positivity of the parent's attitude towards the child will greatly influence the development of his cognitive abilities (26). In premature babies, substances from breast milk can affect the structural development of the brain. Polyunsaturated fatty acids (LCPUFA), especially docosahexaenoic acid (DHA), are considered to play an important role. Numerous hormones and growth factors that primarily affect the growth of glial cells and myelination, increasing the volume of the white young mass, are also highlighted. Research has shown that the development of the white matter of the brain is directly responsible for the in-

tellekt in humans. Children who have been breastfed, especially boys, show faster development and a larger volume of the brain's white matter. This suggests that breastfed children will have better cognitive and other intellectual functions later in life (27).

CONCLUSION

Under the auspices of the World Alliance for Breastfeeding Action (WABA), every year during the first week of August, the public's attention is drawn to the importance and importance of breastfeeding. This year's slogan "Stand up for breastfeeding, educate and support" additionally supports the fact that breastfeeding is an important public health issue, the promotion of which should be especially promoted by pediatricians and gynecologists. Breastfeeding is the best, easiest, most economical, most accessible, cleanest, safest, and most beautiful form of feeding for mother and child. The specifics of the composition of human milk, together with the mother's hormones, offer numerous advantages necessary for the optimal growth and development of the child and the healthier life of its mother.

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Sažetak

KORISTI DOJENJA ZA MAJKU I DETE

Miolski Jelena^{1,2}

¹ Medicinski fakultet Univerziteta u Beogradu, Beograd, Srbija

² Odeljenje za pedijatriju i neonatologiju, Opšta bolnica „Stefan Visoki“, Smederevska Palanka, Srbija

Dojenje je najbolji način ishrane deteta tokom prvih šest meseci života, pa do kraja druge godine. Neraskidiva veza koja je postojala tokom trudnoće između majke i njenog deteta, nastavlja se i tokom procesa laktacije, dajući brojne benefite kako za majku tako i za dete.

Zahvaljujući dejstvu mnogih hormona nakon porođaja, laktacija nudi brojne prednosti za majku. Oksitocin uzrokuje smanjenje materice i krvarenja, izostanak menstruacije, brži povratak telesne mase, manji rizik za nastanak karcinoma reproduktivnih organa, sprečava nastanak osteoporoze kao i razvoja metaboličkog sindroma. Dojenje svakako obezbeđuje i bolju emocionalnu vezu sa detetom. Specifičnost u sastavu humanog mleka novorođenčetu pruža kratkoročna i dugoročna

protektivna dejstva. Zahvaljujući humanim oligosaharidima, imunoglobulinima, polinezasićenim masnim kiselinama koji utiču na sastav mikrobioma creva novorođenčeta, kao i na formiranje njegovog imunog odgovora, dojena deca manje obolevaju od respiratornih i digestivnih infekcija, alergija na hranu, autoimunih bolesti dokazano imaju veći koeficijent inteligencije.

Dojenje predstavlja oblik hranjenja koji je najbolji za majku i dete. Specifičnost sastava humanog mleka obezbeđuje optimalan rast i razvoj deteta i zdraviji život njegove majke.

Cljučne reči: majčino mleko, dojenje, korist dojenja, majka, oksitocin, humani oligosaharidi, novorođenče.

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Correspondence to/Autor za korespondenciju

Jelena Miolski

Address: 147 Vuka Karadžića Street, Smederevska Palanka, Serbia.

Phone: 026/330-300. E-mail: jelena.miolski@doctor.com

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