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Review Article

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Mikrobiyota ve Anne Sütü

Microbiota and Breast Milk

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Özet
Maternal mikrobiyotadan kaynaklanan moleküler sinyaller, gebelik sırasında bebeğe plasenta yoluyla, doğumdan sonra ise anne sütü ile ulaşabilmektedir. Bağırsak mikrobiyota bileşimi bebek ve yetişkin sağlığında önemli rol oynamaktadır. Anne sütü bakterileri, katı gıda alımından sonra devam eden etki ile bebek mikrobiyatasının oluşumunu ve gelişimini etkilemektedir. Hayatın erken dönemlerinde kazanılan bağırsak mikrobiyotasındaki değişiklikler, ilerleyen dönemlerde kısa süreli hastalıklar ve kronik hastalıklar geliştirme riski ile ilişkilendirilmektedir. Anne sütü aracılığıyla bağırsakta bulunan mikroorganizmaların bebeklerin gelişimi ve bağışıklık sistemlerinin olgunlaşması üzerinde etkileri olduğunu ileri sürülmüştür.

Anahtar Kelimeler: Anne sütü, mikrobiyata, bebek

Abstract
Molecular signals originating from the maternal microbiota can reach the baby through the placenta during pregnancy and through breast milk after birth. Intestinal microbiota composition plays an important role in infant and adult health. Breast milk bacteria affect the formation and development of infant microbiota, with an effect that persists after solid food intake. Changes in the gut microbiota gained in the early stages of life are associated with the risk of developing short-term diseases and chronic diseases in the future. It has been suggested that microorganisms found in the gut through breast milk have effects on the development of infants and the maturation of their immune systems.

Keywords: Breast milk, microbiota, infant

GİRİŞ

Microbiota is defined as a community of microorganisms (bacteria, fungi, viruses, archaea, etc.) found in a specific ecological place or environment. The word microbiome, which is often used instead of the word Microbiota, refers to the genetic pool of microbiota living in a particular place and their relationship with the environment (Collado, Rautava, Aakko, Isolauri & Salminen, 2016).

Early life nutrition plays a key role in shaping an infant's future health. Breast milk is considered the gold standard for infant nutrition, as it provides all the nutritional factors necessary for optimum infant development (Beghetti et al., 2019). Along with the various changes that occur in the mother's body from the beginning of pregnancy, there is also a differentiation in the microbiota. It has been reported that the microbiota in the intestinal and mammary glands changes, and some bacteria are present in the breast milk in the last stages of pregnancy (Güney & Çınar 2017).

Breast milk is basically expressed as the gold standard of infant nutrition, which contains carbohydrates, proteins, fats, vitamins, water and minerals necessary for the growth and development of the baby. However, beyond that, it also contains various bioactive components necessary for the health of the baby. Breast milk microbiota, which is formed by many different microorganisms, is one of the most important bioactive

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components (Bode et al., 2014). Recent studies have shown that breast milk contains more than 200 bacterial phylotypes (Bode et al., 2014; Murphy et al., 2017). It has been reported that Staphylococci and Streptococci are mostly found in breast milk, regardless of geographical location and analysis technique used (Fitzstevens et al., 2016). While the basic microbiota of breast milk constitutes 50% of the entire microbiota, the remaining 50% is unique to the mother and varies depending on environmental conditions (Bode et al., 2014).

Reviewing studies examining microorganisms in breast milk, LaTuga et al. most commonly Staphylococcus, Streptococcus, Veillonella, Gemella, Enterococcus, Clostridia, Bifido bacteria, Lactobacillus, Propioni bacteria, Actinomyces, Corynebacterium, Pseudomonas, Sphingomonas, Serratia, Escherichia, Enterobacter, Robstonia, Bradyrvohizatin bacteria are detected in breast milk. Living environment, maternal health status, obesity, atopy, diet, immunological status, mode of delivery, gestational age, antibiotic use and lactation stage are the most important factors affecting the structure of breast milk microbiota (Güney & Çınar 2017).

DEVELOPMENT OF INFANT MICROBIOTA

The effect of breast milk on the development of infant microbiota is associated with the development of healthy microbiota in the baby and the health of the mother's microbiota. In the literature, the effect of microorganisms in breast milk on the development of the infant's microbiota has been shown by various studies. In the studies, microorganisms in breast milk and faeces of mother and baby were compared, and it was determined that some bacterial species were common (Güney & Çınar 2017). In the study of Solis et al., fecal samples of twenty term babies born by vaginal route and their mothers' milk were taken on the 1st, 10th, 30th and 90th days found to be dominant. The most common bacteria in breast milk is Streptococcus, and Lactobacillus and Bifido bacteria were also found. As a result of the analysis, it was determined that the fecal sample of an infant and the Bifido bacteria species in its mother's milk had the same genetic profile. For this reason, it is thought that breast milk contributes to the development of the first microbiota in the newborn. In addition, it has been determined that the Bifido bacterial profile in different babies is different, that is, the Bifido bacterial population is unique to each baby (Güney & Çınar 2017).

The transmission of the mother's milk microbiota to the baby occurs as a result of highly complex and advanced processes. Especially the first 3-4 months have a critical importance in the development of microbiota. Bacteria transmitted from the mother's vaginal, fecal and skin microbiota are the first microorganisms to colonize the newborn's intestine. The microbiota of a baby born by normal birth consists of bacteria such as E. coli, Staphylococcus and Streptococcus, which are initially transferred to the baby while passing through the birth canal. These facultatively anaerobic bacteria multiply and form an anaerobic environment after a few days. This environment allows the colonization and predominance of Bacteroides and Bifido bacteria, which pass from breast milk to the baby and reproduce only in an anaerobic environment. Newborns who are not breastfed, on the other hand, have a greater diversity of bacteria in their intestines and

less Bifi do bacteria. Cessation of breast milk and/or introduction of complementary foods causes a dramatic change in bacterial colonization in the baby's gut. At this stage, there is a decrease in Bifido bacteria and Enterobacteriaceae, while an increase in Bacteroides, Clostridium, Ruminococcus bacteria occurs. Between 12 and 30 months, a microbiota similar to colonization in the adult intestine is reached. Around the age of 3 years, the gut microbiota now resembles that of an adult (Güney & Çınar, 2017)

Babies fed with different foods other than breast milk have a more sensitive structure against pathogenic microorganisms and infections. However, the effect of nutrition on the development of microbiota is still not understood. It was determined that Bifidobacteria increased in the intestinal microbiota content of exclusively breastfed infants, while the intestinal microbiota developed less in infants fed with formula (without prebiotic supplementation). It has been stated that breast milk constitutes one of the main bacterial sources of the breastfed baby's intestine, and a baby consuming approximately 800 ml/day of milk will develop 1x105 to 1x107 bacteria per day. Lactation stage has been defined as a factor affecting microorganisms in milk (Rautava 2016; Romero, et al. 2014). In a meta-analysis study that included seven microbiome studies (1825 stool samples from 684 infants) to compare the gut microbiota of exclusively breastfed and non-breastfed infants; Exclusively breastfed infants have been found to have increased microbial diversity and colonization. In addition, only breast milk was found to have a protective effect on the infant gut microbiota during diarrhea attacks, and the intestinal microbiota difference between infants continued after 6 months (Ho et al., 2018). In a study conducted by Pannaraj et al. with 107 healthy mother-infant couples, it was found that breastfed infants ingest 27.7% of their intestinal microbiota from breast milk and 10.4% from the skin of the areola in the first month of life (Pannaraj et al., 2017) However, there are factors that can negatively change the microbiota in breast milk. These; maternal obesity, gestational age, maternal malnutrition, maternal immunological disorders, delivery with CS, preterm births and maternal antibiotic use (Rigon et al., 2016; Smaill, Grivell, 2014).

CONCLUSION AND RECOMMENDATIONS

Recent studies have shown that the uterine cavity, which is thought to be sterile, has a unique microbial flora. Changes in the microbiota can affect both the pregnancy process and the baby positively and negatively. From the beginning of intrauterine life; maternal vaginal microbiome, maternal obesity, malnutrition, antibiotic use, allergy status, mode of delivery, birth weight of the newborn and breastfeeding status significantly affect the infant microbiota. It is essential that health professionals, who have an important role in improving the health of the society, understand the effect of microbiota on healthy life. Especially those working in the field of women's health have an important role and responsibility in ensuring optimal microbiome development during pregnancy, childbirth and postpartum period. In conclusion, the profound impact of the human microbiome on health requires nurses to understand the basic structures and functions of diverse microbial communities.

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