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MODERN APPROACHES TO THE INTRODUCTION OF SUPPLEMENTARY FEEDING TO NEWBORNS AND CHILDREN OF THE FIRST YEAR OF LIFE. HOW RIGHT

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Abstract. Over the past decades, under the auspices of the World Health Organization, a lot of work has been done in all countries of the world to support breastfeeding among medical institutions and public organizations. The importance of the formation of a dominant lactation and the provision of professional assistance to a nursing woman is determined. These measures allow you to resolve temporary difficulties and maintain long-term breastfeeding. If there are objective reasons for additional feeding of the child, the appointment of infant formula should be justified and personalized.

Keywords: *newborns, breastfeeding, supplementary feeding, infant formula*

СОВРЕМЕННЫЕ ПОДХОДЫ К ВВЕДЕНИЮ ДОКОРМА НОВОРОЖДЕННЫМ И ДЕТЯМ ПЕРВОГО ГОДА ЖИЗНИ. КАК ПРАВИЛЬНО

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Резюме. На протяжении последних десятилетий под эгидой Всемирной организации здравоохранения во всех странах мира ведется большая работа по поддержке грудного вскармливания среди медицинских учреждений и общественных организаций. Определена важность формирования доминанты лактации и оказания профессиональной помощи кормящей женщине. Данные мероприятия позволяют разрешить временные сложности и сохранить длительное грудное вскармливание. При наличии объективных причин для докорма ребенка назначение детских молочных смесей должно быть обоснованным и персонифицированным.

Ключевые слова: *новорожденные, грудное вскармливание, докорм, детские молочные смеси*

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INTRODUCTION

The problem of nutrition of children of the first year of life is particularly relevant in the modern pediatrics [1, 2].

Increasing the prevalence of breastfeeding (BF) is a target indicator of population health indicators. Modern science defines breastfeeding as the most important postnatal factor of long-term metabolic programming and a factor of protection against "civilization's diseases" in later life [3, 4]. Breast milk (BM) is recognized as the normative standard in infant nutrition [5, 6].

Timing of breastfeeding and type of feeding are key aspects in shaping a healthy generation in the future. The task of all obstetric institutions is to provide timely and professional medical care for mother and child, as well as support breastfeeding, including the organization of optimal feeding for newborns who cannot be breastfed [7].

It should be noted that in recent years there has been data on the not necessarily prescription of formula feeding (FF) in obstetric centers. Thus, according to foreign studies, about half of newborn premature infants received supplementary feeding in the early neonatal period. In more than half of these cases, there were no objective medical indications for the administration of supplementary feeding. These data should be in the centre of attention because the administration of supplementary feeding, regardless of the amount of formula in the first 48 hours, sharply reduces the readiness for breastfeeding in the subsequent period [8].

In Russia, the practice of prescribing FF to healthy newborns without clear justification also occurs at the maternity hospital stage. The prescription of FF in obstetric institutions should be considered as part of therapeutic measures [9].

The association of early introduction of infant formula feeding with the risk of infectious diseases and increased cases of food allergy has been determined [10, 11]. Artificial formula feeding increases the risk of metabolic syndrome, type 1 diabetes mellitus, and cardiovascular diseases [12–14].

A World Health Organisation meta-analysis showed an association between breastfeeding and a low prevalence of overweight or obesity in later life. Perhaps one mechanism for this protective effect is related to protein intake and energy metabolism, which are lower in children who receive breast milk compared to those fed cow's milk [13, 14].

Based on the results of scientific studies, it has been suggested that the development of cardiovascular diseases is programmed in infancy, and a possible reason for the development of pathology is the lack of breastfeeding in the first year of life [13, 14].

Data from epidemiological scientific studies have shown a correlation between cow's milk consumption and the incidence of type 1 diabetes mellitus (DM). It is now suggested that the introduction of infant formula into the diet of children during the first months of life is a trigger that may provoke the development of type 1 DM [15, 16].

Administration of supplementary feeding in obstetric institutions: in the form of mixtures based on cow's milk proteins increases the risk of developing allergy to these proteins by 7 times [17]. It has been established that even a single use of formula leads to an increased risk of allergy development regardless of the amount of formula [18].

There is strong evidence on the role of the gut microbiota in the development of food allergy. Gut microbiota is involved in the formation of oral tolerance. Altered gastrointestinal flora is one of the links in the pathogenesis of a food allergy. There is an evidence that the addition of formulas affects the composition of gut microbiota of the child. The result of this effect is a decrease in the number of bifido- and lactobacilli necessary for competition with opportunistic microorganisms, for the production of short-chain fatty acids and, most importantly, for the stimulation of mucosal immunity [10, 19, 20].

The influence of breastfeeding on the formation of child behaviour and intelligence has been proven. Numerous mechanisms of this influence have been described. The concept of the microbiota-gut-brain axis deserves special attention [21, 22].

Breastfeeding contributes to optimal physical and psychological health and enhances the child's mental and cognitive abilities [23, 24]. A well-known large-scale prospective study found a direct correlation between the duration of breastfeeding during the first year of life, speech development and intellectual ability [23, 25].

It should be noted that not all mothers are able to breastfeed after birth, and not all children are able to breastfeed.

In the Russian Federation, the absolute contraindications for breastfeeding a child from the mother's side are: HIV infection, acute mental disorders, particularly dangerous infections, open form of tuberculosis, carrier of T-lymphotropic virus, treatment with cytostatic and radioactive drugs. The presence of a number of congenital metabolic diseases in children are absolute contraindications to breastfeeding [26, 27].

The awareness of a lactating woman about the occurrence of lactation crises is important for the preservation and maintenance of lactation. It is known that lactation crises occur 3–4 weeks after delivery, in the 3–4th and 7–8th months. The duration of lactation crises is 3–5 days. As a rule, already after 6–8 days more milk is being produced.

During this period of life, it is recommended to frequently apply the baby to the breast, adequate rest, plenty of warm drink, contrast shower on the area of the mammary glands before feeding, light massage of the mammary gland. A positive attitude of the mother and orientation of all family members to support breastfeeding are important, which will help to avoid unjustified transfer of the child to formula feeding [26, 28].

SUPPLEMENTARY FEEDING

The program for optimising infant feeding in the first year of life provides clear recommendations on the introduction of supplementary feeding in newborns and children in the first year of life [26]. When introducing supplementary feeding in the neonatal period, the physician should first of all be guided by the initial weight loss of the child, which normally should not exceed 10% by the third day [29].

The causes of pathological loss of initial body mass on the part of both mother and child (e.g. hypogalactia, anatomical features of the mammary gland, dysphagia, newborn depression syndrome) should also be taken into account.

The protocol of the International Academy of Breastfeeding Medicine emphasises that the first choice of supplementary feeding is decanted mother's milk, donor milk and, only in exceptional cases, infant formula. At the same time, mixtures based on partial protein hydrolysis are the most preferable [30].

It has been established that if supplementary feeding is necessary for a child from 2–3 days of life (loss of 5–6% of body mass 1 day after birth, 7–8% — after 2 days), supplementary feeding in the amount of 10 ml does not affect lactation [31]. In case of ≥10% body mass loss, the amount of supplementary feeding per feeding can be at least 20 ml [32].

On the 1st September 2021, new sanitary and epidemiological rules and regulations SanPiN 3.3686–21 came into effect, according to which the decanted milk of the mother can be used for delayed feeding of the child without subjecting breast milk to special treatment [33].

In 2014, the Scientific Centre for Child Health of the Russian Ministry of Health opened the first donor breast milk bank in the Russian Federation (RF), and then two more breast milk banks were opened (in Ufa and Chelyabinsk) [33].

Another negative aspect of early introduction of supplementary feeding is the decrease in the prevalence and duration of breastfeeding. A systematic review and meta-analysis of 9 prospective studies on the effect of introducing breastmilk substitutes to newborns between 4 days and 4 weeks postpartum on the results of breastfeeding duration showed that this practice is a statistically significant risk factor for shorter breastfeeding duration [34].

According to the Programme for the Optimisation of Infant Feeding in the First Year of Life, insufficient weight gain in the first month of life is the basis for the introduction of supplementary feeding (a gain of less than 400 g in the first month of life is pathological). Children with weight gain for the first month of life in the range from 400 to 600 g, require an individual approach. This allows timely prescription of measures aimed at stimulating lactation and, if necessary, supplementation with infant formula [26, 35].

A rising weight curve centred on standardised growth scales is used to assess and correct any supplementary feeding interventions. Check-weighing can be performed either weekly or daily, depending on the achievement of optimal weight gain (26–30 g/day should be considered normal) [26, 36].

The approximate normal weekly weight gain in the first 3 months of life is 180–200 g per week, and 120–130 g per week at the age of 3–6 months [26]. Control weights are not an objective indication of lactation adequacy and allow to estimate only the amount of breast milk received by the child.

It is necessary to take into account the degree of morphofunctional maturity of the child, features of his physical development, allergological anamnesis, and the presence of functional disorders during choosing a product for supplementary feeding [37]. An important criterion for the correct choice of an infant formula is its good tolerability: an absence of dyspeptic disorders and allergic rashes.

There is no convincing evidence on the advantages of any of the used methods of supplementary feeding, as well as the presence of risks in their use. A baby can be fed in different ways, either from a bottle or from a cup/spoon. In each case, the doctor makes a decision depending on the individual characteristics of the child and the mother's preferences [26].

It is necessary to strive to ensure that infant formula feeding is temporary, administered in a limited amount, carried out against the background

of lactation stimulation and cancelled in a timely manner if the child has stable (over several days) weight gain of at least 20–30 g/day [26].

CONCLUSION

The introduction of supplementary feeding or complete conversion of a child to formula feeding should be strictly justified and carried out only when the need to introduce formula into the child's diet is objective, and the entire arsenal of means aimed at stimulating lactation has proved ineffective. None, even the most modern formula can serve as a full-fledged substitute for mother's milk [37].

An effective measure to support lactation in the mother and to maintain successful breastfeeding in case of inability to breastfeed is feeding the child with decanted breast milk. The use of decanted breast milk without heat treatment maximises the preservation of its biological value. The existing developed and approved recommendations on the organisation of individual breast milk banking in children's medical institutions and at home will certainly contribute to increasing the prevalence of breastfeeding in the Russian Federation [33]. Only the joint work of medical and public organisations will make it possible to maximise the implementation of the program to optimise the breastfeeding of children in the first year of life [38].

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

Competing interests. The authors declare that they have no competing interests.

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Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

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