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Department of Gynecology and Obstetrics, Clinical Medical Center Rijeka

BREAST-FEEDING IN PRETERM INFANTS

DOJENJE PREMATURUSA

Aleksandra Frković, Antonija Dujmović, Elizabeta Tomašić-Martinis

Original paper

Key words: preterm infants, maternal milk

Summary. ***The aim.*** If maternal milk is the best food for a term infant, for a preterm infant it will also be the best for the growth and development of an immature child. The aim of this work was to examine, by retrospective analysis, the frequency of breast-feeding in preterm infants and relate it with some epidemiologic variables (demographic, social, medical). ***Material and methods.*** In the period from 1993 to 1999 we analyzed the frequency of breast-feeding in all preterm deliveries from 22 to 36 weeks of gestation except for multiple pregnancies. The clinic for Gynecology and Obstetrics of Clinical Hospital Center Rijeka is the first maternity hospital in Croatia that was proclaimed »Baby Friendly Hospital« by the UNICEF in 1996. We analyzed the following parameters in mothers: the age, matrimonial status, education, course of pregnancy, mode of beginning and delivery termination. In newborns: weight, Apgar score ≤7 at the first and fifth minute, acidosis, intracranial hemorrhage, early neurological signs, respiratory distress syndrome and infections. ***Results.*** In the examined period there were 22 119 deliveries out of which 923 (4.17%) were preterm deliveries. Out of the total of 923 preterm infants 453 (49.07%) were breast-fed: from 29 to 32 weeks of gestation 20 (4.41%) newborns, and from 33 to 36 weeks 433 (95.58%) newborns. Apgar score ≤7 at the first minute was present in 97 (21.41%) cases. Apgar score ≤7 at the fifth minute was present in 37 (8.16%) cases. No newborn had acidosis, 8 (1.76%) newborns had intracranial hemorrhage, one had (0.22%) early signs of cerebral disorder, 33 (7.28%) respiratory distress syndrome and 35 (7.72%) infection. Fifty percent of our preterm infants were fed with maternal milk and we continue to make additional efforts to reduce the percentage of non breast-fed children. Mothers who were breast feeding were more frequently primiparae aged from 26 to 35, married, employed and smoked up to 10 cigarettes a day. In mothers who were breast-feeding no children died. ***Conclusion.*** Feeding preterm infant with maternal milk should be a part of the intensive care and therapy of such a child.

Izvorni članak

Ključne riječi: majčino mlijeko, prematurus

Sažetak. ***Cilj rada.*** Ako je majčino mlijeko najbolja hrana za donošeno dijete, onda je i za prijevremeno rođeno dijete, majčino mlijeko najbolje za rast i razvoj nezrelog novorođenčeta. Namjera ovog rada je ispitati retrospektivnom analizom učestalost dojenja kod prematurusa te povezati ih s nekim epidemiološkim varijacijama (medicinskim, socijalnim, demografskim). ***Metode.*** U razdoblju od 1993. do 1999. godine analizirali smo frekvenciju dojenja svih prematurusa od 22. do 36. tjedna gestacije, osim multiplih trudnoća. Klinika za ginekologiju i porodništvo Kliničkog bolničkog centra Rijeka, prvo je rodilište u Hrvatskoj proglašeno »Bolnicom prijateljem djece« od UNICEF-a godine 1996. Analizirali smo prateće parametre u majki: životnu dob, bračno stanje, školovanje, tijek trudnoće i poroda. U novorođenčeta: rodnu masu, Apgar zbroj (7 ili manje od 7 u prvoj i petoj minuti), zatim acidozu, rane neurološke simptome, respiratorni distres sindrom i infekcije. ***Rezultati.*** U ispitivanom razdoblju bilo je 22.119 poroda od toga 927 (4,17%) prijevremenih poroda. Od 923 prematurusa, 453 (49,07%) bilo je hranjeno majčinim mlijekom. Od 29. do 32. tjedna trudnoće 20 (4,41%) novorođenčadi, a od 33. do 36. tjedna gestacije njih 433 (95,58%). S Apgar zbrojem ≤7 u prvoj minuti bilo je 97 (21,41%) djece, a Apgar zbrojem ≤7 u petoj minuti bilo je 37 (8,16%) djece. Ni jedno od istražene djece nije imalo acidozu, 8 (1,76%) je imalo intrakranijalno krvarenje, jedno dijete rane neurološke simptome, 33 (7,26%) respiratorni distres sindrom, a 35 djece imalo je infekciju. Pedeset posto nedonoščadi hranjeno je majčinim mlijekom, a činimo dodatne napore za smanjenje postotka nedojene djece. Majke koje su dojile svoju prijevremeno rođenu djecu češće su bile prvorotkinje, životne dobi od 26 do 35 godina, udane, zaposlene, pušile su manje od 10 cigareta dnevno. Od dojene djece ni jedno nije umrlo u neonatalnom razdoblju. ***Zaključak.*** Hranjenje nedonoščadi majčinim mlijekom moralo bi biti sastavni dio intenzivne njege i terapije.

Introduction

If maternal milk is the best food for a term infant, for a preterm infant it is also the best for the growth and development of an immature child. Preterm infants do not have the reflex of sucking and swallowing, so the mother needs help and has to be taught how to breast-feed and be motivated to stay with her child and feed it with her milk. Immediately after delivery the mother has to be assisted with breast-feeding and the newborn fed with mother's milk. Most frequently, the feeding starts with a gastric tube. Premature infants with the birth weight less than 1500 g are obligatorily fed with a probe, along with the usual parenteral nutrition. Gradually, when a child begins to gain weight, becomes mature, develops the ability of swallowing and sucking reflex, we try to establish breast-feeding as a way of nutrition. There are no rules in this suitable adaptation, the procedure is individually adapted to the mother and the child.

Most mothers showed some »effort« associated with breast-feeding their preterm infants, but indicated that overall breast-feeding was a rewarding experience. Kavanaugh et al.[1] data provide scientific support for the promotion and facilitation of breast-feeding for mothers of preterm infants, in which mothers perceive specific emotional advantages that they relate to the breast-feeding experience. Most mothers if correctly informed and en-

couraged, are able to breast-feed exclusively or partially their very low birth weight preterm infants (VLBW), including twins, in the first months of life.[2] The functions of the gut are modulated by the autonomic nervous system and gut peptides, such as somatostatin and cholecystokinin which have opposite functions. Tornhage et al.[3] in their study report plasma somatostatin and cholecystokinin levels in response to feeding in preterm infants. Plasma somatostatin and cholecystokinin increased after feeding in small for gestational age infants on day 1; on days 3 and 4 the responses to feeding seemed to be dependent on the infant's gestational age. Breast-feeding enhanced the release of cholecystokinin but not that of somatostatin. Diaz Gomez et al.[4] in their study suggest that the insulin-like growth factors IGF-1 levels during the neonatal periods are influenced by the maturity stage of the newborn, energy intake and the type of lactation.

Lucas et al.[5] on the basis data on cerebral palsy, offer a new hypothesis that suboptimal nutritional management in preterm newborns during a critical or plastic early period of rapid brain growth could impair functional compensation in those sustaining an earlier brain insult. Although subclinical or biochemical witamin E deficiency was seen in healthy, premature infants fed by breast milk in the first 6 weeks of life in plasma and buccal mucosal cells, the other cells showed no such deficiency.[6] In mothers of preterm infants a high incidence of cytomegalovirus excretion into breast milk was detected. There is evidence that the most immature infants are at the greatest risk to acquire an early and symptomatic CMV infection.[7]

The aim of this work was, by retrospective analysis, to examine the frequency of breast-feeding in preterm infants and relate it with some epidemiologic variables (demographic, social, medical).

Materials and methods

In the seven year-period from 1993 to 1999 we analyzed the frequency of breast-feeding in all preterm deliveries from 22 to 36 weeks of gestation at the Clinic for Gynecology and Obstetrics, Clinical Hospital Center Rijeka, except for multiple pregnancies. It is the first maternity hospital in Croatia that was proclaimed »Baby Friendly Hospital« by UNICEF in 1996. We analyzed the following parameters in mothers: age, matrimonial status, education, occupation, smoking, outcome of previous pregnancies, gestational age, course of pregnancy, mode of beginning and delivery termination. In newborns: weight, Apgar score ≤7 at the first and fifth minute, acidosis, intracranial hemorrhage, early signs of neurological disorders, respiratory distress syndrome, infections.

Results and conclusion

In the examined period there were 22 119 deliveries out of which 923 (4.17%) were preterm deliveries. Out of 923 preterm infants, 453 (49.07%) were fed with mother's milk. The greatest number of pregnant women (235 – 51.87%) was aged 26–35; 364 (80.35%) pregnant women were married, 78 (17.21%) were unmarried, 10 (2.20%) were divorced, and one (0.22%) was a widow; 288 (63.57%) of pregnant women had secondary educational degree, and 79 (17.43%) had high educational degree *(Table 1)*.

Table – Tablica 1. Education – Edukacija (školovanje)

	N	%
Unschooled – Bez škole	7	1.54
Uncompleted – Nepotpuno	15	3.31
Elementary school – Osnovna škola	64	14.12
Secondary school – Srednja škola	288	63.57
College – Viša škola	22	4.85
University – Fakultetsko obrazovanje	57	12.58
Total – Ukupno	453	100.00

Table 2. Smoking in pregnancy (cigarettes/day)
Tablica 2. Pušenje u trudnoći (cigarete/dan)

Group – Skupine	N	%
No – Ne	306	67.54
Sometimes – Ponekad	9	1.98
1–10	109	24.06
11–20	27	5.96
>20	2	0.44
Total – Ukupno	453	100.00

In 304 (67.10%) cases pregnant women were employed. In the examined group 306 (67.54%) pregnant women were nonsmokers. In the group of smokers (147) the majority (109 – 74.14%) smoked up to 10 cigarettes a day *(Table 2)*. 233 (51.43%) pregnant women were primiparae, while 214 (47.24%) had 1–3 deliveries and 6 (1.32%) of them had 4 deliveries. In 74 (16.33%) pregnant women previous pregnancies were terminated with 1 to 3 miscarriages and in 103 (22.73%) cases previous pregnancy terminated with 1 to 3 abortions.

From 29 to 32 weeks of gestation 20 (4.41%) breast-fed newborns and from 33 to 36 weeks 433 (95.58%) were delivered. Regarding hemorrhage in pregnancy 41 (9.05%) mothers were bleeding in the first trimester, 11 (2.42%) in the second and 7 (1.54%) in the third trimester. Twenty-four (5.29%) mothers had hypertension, 16 had gestosis (3.53%), 28 uroinfection (6.18%). In 199 (43.92%) cases delivery started with spontaneous labours and in 224 (53.86%) cases with premature rupture of membranes. In 390 (86.09%) cases delivery was terminated vaginally and in 63 (13.90%) cases with caesarean section. In the group weighing from 1000–1499 g only one newborn was breast-fed, and from 1500–2499 g there were 160 (35.32%), and in the group ≥2500 g there were 292 (64.45%). Apgar score ≤7 at the first minute was present in 97 (21.41%) cases. Apgar score ≤7 at the fifth minute was present in 37 (8.16%) cases. No newborn had acidosis, 8 (1.76%) newborns had intracranial hemorrhage, one had (0.22%) early signs of a cerebral disorder, 33 (7.28%) respiratory distress syndrome and 35

(7.72%) infection. No children died post partum. In the examined period in the group of 470 preterm infants who were not breast-fed 81 (17.23%) children died. Fed with mother's milk, premature infants gain weight more quickly, stay in hospital shorter and have all the benefits of breast-fed children. We have very good results with healthy premature infants, while with ill premature infants – infections, respiratory distress, bleeding, malformations – we did not succeed in motivating the mother to collaborate. Mother is psychologically inhibited because of the uncertain outcome of the disease, so breast-feeding is not easily introduced. It is the reason why there is the highest incidence of lethal outcome in the group of not breast-fed newborns.

All the benefits of maternal milk – protection against infections, allergies, better growth and development – are extremely important in preterm infants. It is considered that maternal milk is very important for the brain development and maturation. But, Jacobson et al.[8] on the basis of their results suggest that the observed advantage of breast-feeding preterm children on intelligence quotient is related to genetic and socio-environmental factors rather than to the nutritional benefits of breast-feeding on neurodevelopment.

Preterm twins can be breast-fed as successfully as preterm single infants: as with sufficient assistance and encouragement, their rates of breast-feeding were comparable to those of term infants.[9] Breast-feeding rather than gestational age is strongly related to night waking. More support for dealing with night waking might prevent early termination of breast-feeding.[10] Colonna et al.[2] found that 49% of single and 38% of twins were discharged on feeding maternal milk, 14% and 24% maternal milk and formula milk and 37% and 38% formula milk only. In our examined material 49.07% of preterm infants were fed with maternal milk. Hill et al.[11] examined the feeding patterns of a low birth weight infant (1500–2500 g) on the day of hospital discharge and 4 weeks after birth. 52% of the preterm low birth weight infants had effective vigorous feedings at the breast at hospital discharge as rated by the mothers. Forman et al.[12] examined the rate of breast-feeding among mothers of very low birth weight infants (<1500) and the correlates of breast milk pumping and of nursing are very low. These authors think that specific interventions and better support might improve the success rates. In the group of 1500 to 2499 grams our newborns were breast-fed in 35.32% of cases.

Kangaroo care for preterm infants is becoming well-known in the United States.[13] Based on the general bonding hypothesis, it is suggested that kangaroo mother care (KMC) creates a climate in the family whereby parents become prone to sensitive care giving. The general hypothesis is that skin-to-skin contact in the KMC group will build up a positive perception in the mothers and a state of readiness to detect and respond to infant's cues. On this basis Tessier et al.[14] suggested that KMC should be promoted actively and that mothers should be encouraged to use it as soon as possible during the intensive care period in infants weighing <2000 g.

We can conclude that 50% of our preterm infants were fed with maternal milk and we have to make additional efforts to reduce the percentage of non breast-fed children. Breast-feeding mothers more frequently primiparae aged from 26 to 35, married, employed, smoking up to 10 cigarettes a day. In mothers who were breast-feeding no children died. Feeding preterm infant with maternal milk should be a part of the intensive care and therapy of such a child.

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Address for correspondence: Prof. dr. Aleksandra Frković, Strossmayerova 18, 51000 Rijeka