

# Breastfeeding success in low birth weight infants

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## ABSTRACT

*Breastfeeding is a fundamental public health issue since it promotes health, prevents disease and helps contribute to reducing health inequalities. It provides the foundation for a healthy start in life and prevents disease in the short and long-term for babies and their mothers. The aim of the study was to point out the incidence of breastfeeding among low birth weight (LBW) infants and factors that can influence it. We want to show that breastfeeding can be set independently of serious medical complication even in LBW infants.*

*All LBW preterm (birth weight of up to 1500 g) admitted to the neonatal intensive care unit (NICU) from 2009 to 2011 were investigated. All LBW preterm infants had their mothers with them.*

*The study included 69 preemies with a gestational age from 25 to 32. About 36% of infants were breastfed, 29% were fed with their mother's milk, and 35% were fed a combination of mother's milk and industrial preparations. Severe medical complications were not connected with successful breastfeeding in our study. Success of breastfeeding is statistically connected only with the gender of the preemie or a premature infant, and with the duration of bottle feeding.*

*In observing the impact of complication (cerebral haemorrhage, asphyxia, mechanical ventilation and infection) on the success of breastfeeding there was no statistically significant difference. The manner in which breastfeeding begins is very important in LBW infants. When a premature baby begins to breastfeed, it is best to not to add milk from the bottle (despite weight loss).*

**Key words: breast feeding, low birth weight infants (LBW), mechanical ventilation, cerebral haemorrhage, kangaroo care**

## Introduction

Any amount of breastfeeding has benefits for both the child and mother, and the longer the duration of breastfeeding, the greater the effect on improving the child's health. All mothers can breastfeed, provided they have accurate information and the support of the healthcare system and society. Not all mothers will choose to breastfeed, and they should be supported by the neonatology team regardless

of what their infant feeding choice may be. Feeding at the breast has a positive effect on health and wellbeing and is associated with significantly improved health outcomes for both infants and mothers. Human milk provides infants with all nutrients they need for healthy growth and development. Breast milk is also easy to digest. The establishment of early breastfeeding is especially important for preterm infants. They benefit from the antibodies, hormones, enzymes and growth factors contained in breast milk. These infants have less chance of being constipated, less likelihood of becoming obese (and therefore lower likelihood of developing type 2

diabetes and other illnesses in life), and less chance of developing eczema and allergies. Breastfed preterm infants also have less risk of stress, less weight loss and faster weight gain, as well as earlier hospital discharge. The maternal perception of breastfeeding as being "very important" is connected with breastfeeding duration. This can be identified and addressed during pregnancy and in the postnatal period. (1)

Breast milk is a unique, constantly changing, protective substance that includes antibodies from the mother that help babies to combat infection. Breastfed babies have less chance of gastrointe-

stinal and ear infections, fewer allergies, lower incidence of certain cancers, and less chance of hospitalisation as a result of these illnesses. Babies born early are particularly vulnerable to certain dangerous medical conditions, such as necrotising enterocolitis. Preemies benefit most from the protection of infection that human milk provides. The antibodies in mother's milk coat the inside of the baby's intestines, thus sealing off tiny openings where germs could otherwise make their way to the bloodstream. Some components of mother's milk directly kill germs, while others make it difficult for them to grow. Mother's milk helps premature babies develop the ability to fight infection on their own by turning on certain genes and processes that control the immune system's defences against infection. Human milk also adjusts to the individual baby's needs regardless of when they are born, meaning there is no need for concern in meeting the baby's nutritional needs. Breastfeeding can help provide some of the nutrients that can minimise the risk of many of the complications of prematurity; it can facilitate a mother's bonding with her baby, and can support and promote a good parent-child relationship. Developing a warm relationship with a baby can provide benefits for emotional health and wellbeing throughout childhood and adult life. Breast milk also benefits brain growth and development. (2)

Benefits for women include a lower risk of osteoporosis, type 2 diabetes and female cancers (breast, uterine and ovarian), and women who breastfeed their children are able to lose weight gained during pregnancy more easily. Breastfeeding should be a positive experience for mothers. Premature babies can breastfeed even if they are born very early and need special care.

### Materials and Methods

The study was conducted in the Neonatal Intensive Care Unit at the University Hospital Osijek. All premature babies up to 1500 grams (in total 64), who were hospitalised from 2009 to 2011 and who had their mothers with them, were

**Table 1. Breastfeeding success and demographic and clinical parameters of the study group.**

	Sucking Number (%) N = 23	Doesn't suck Number (%) N = 41	Total Number (%) N = 64	p
Residence				
Urban	10 (38)	16 (62)	26 (41)	> 0.05
Rural	13 (34)	25 (66)	38 (59)	
Gender				
Male	15 (44)	19 (56)	34 (53)	< 0.05
Female	8 (27)	22 (73)	30 (47)	
Order of pregnancy				
First	17 (39)	27 (61)	44 (69)	> 0.05
Second	4 (36)	7 (64)	11 (17)	
Third and more	2 (22)	7 (78)	9 (14)	
Birth weight				
Up to 1000g	2 (15)	11 (85)	13 (20)	> 0.05
1001-1200g	7 (37)	12 (63)	19 (30)	
1201-1500g	14 (44)	18 (56)	32 (50)	
Year of birth				
2009	5 (28)	13 (72)	18 (28)	> 0.05
2010	9 (33)	18 (67)	27 (42)	
2011	9 (47)	10 (53)	19 (30)	

included. The study was retrospective and the medical records of the department and the nursing lists were used as a source of data. The following parameters in mothers were analysed: age, number of births, order of pregnancy and place of residence. In newborns the parameters analysed were: Apgar score, birth weight, gestational age, gender, early neurological symptoms (asphyxia, cerebral haemorrhage), presence of respiratory distress syndrome and infection. Not one preterm infant from the study died. Premature babies were divided according to asphyxia in three groups: without asphyxia, blue asphyxia and white asphyxia. According to the severity of cerebral haemorrhage, three additional groups were formed: without cerebral haemorrhage, with light (I and II stage) cerebral haemorrhage, and severe (III and IV stage) cerebral haemorrhage. A preterm baby was placed in the group with infection if two of the following conditions existed: clinical signs of infection, positive blood

culture or urinalysis, C reactive protein higher than 5 mg/L, high leukocytes or leucopenia, or other changes in the differential blood steams (according to recommendations for newborns).

Preemies were fed by gavages till up to 33 or 34 weeks of gestation, and after that with their mother's milk by bottle. When the preterm baby sucked (from the bottle) about 120 ml/kg in a day, the mother would put them on the breast and the baby would no longer be bottle-fed. Feeding by bottle lasts approximately two or three days, depending on the baby. Kangaroo care was practiced for preemies up to 33 or 34 weeks.

Statistical analysis was performed using the SPSS software system, along with the chosen level of significance of p=0.05. Comparison of variables was tested by  $\chi^2$  test with Yates's correction.

### Results

The study included 64 preterm infants of low birth weight. The survey covered only LBW premature infants whose

**Table 2. Connection of breastfeeding success and the presence of complications in infants.**

	Sucking Number (%) N=23	Doesn't suck Number (%) N=41	Total Number (%) N=64	p
Mechanical ventilation				
Yes	13 (32)	27 (68)	40 (63)	> 0.05
No	10 (42)	14 (58)	24 (57)	
Cerebral haemorrhage				
Without	16 (47)	18 (53)	34 (53)	> 0.05
Leight	4 (21)	15 (79)	19 (30)	
Hard	3 (27)	8 (73)	11 (17)	
Asphyxia				
Without	11 (32)	23 (68)	34 (53)	> 0.05
Blue	9 (43)	12 (57)	21 (33)	
Pale	3 (33)	6 (67)	9 (14)	
Infection				
Yes	15 (35)	28 (65)	43 (67)	> 0.05
No	8 (38)	13 (62)	21 (33)	

mothers were in hospital boarding with them. The study included preterm infants of gestational age of 25 to 32 weeks. The largest number of preterm infants (50%) had birth weight between 1201 and 1500 grams. The majority of infants (69%) were the first child in the family, but no statistically significant difference was observed between breastfeeding and the order of pregnancy. Difficulty in establishing breastfeeding in extreme preterm babies was observed. However, gestational age and birth weight did not have significant correlation with successful breastfeeding. An increase in breastfeeding trends in 2011 compared to 2009 was observed, but statistical treatment of the data did not show a significant difference between the year of birth and breastfeeding success. A statistically significant difference in breastfeeding was observed between boys and girls. The place of residence is not connected significantly with the percentage of breastfed preterms. (table 1).

A number of complications were identified in preterm infants. The most severe were: respiratory distress syndrome, cerebral haemorrhage, asphyxia and

infection (connatal, perinatal or hospital). The establishment of breastfeeding did not differ significantly due to the presence of asphyxia. Mechanical ventilation did not have significant correlation with successful breastfeeding. Of the 43 LBW premature infants who have some type of infection, 35% were breastfed, 30% were fed with breast milk from the bottle, and 35% with industrial preparations. Of 34 preterm infants who did not have cerebral haemorrhage, 47% were breastfed, 21% were fed with breast milk from a bottle and 32% with industrial preparations (table 2).

About 36% of preterm infants were breastfeeding. The others were fed by bottle, half of them with mother's milk, and the others with a combination of mother's milk and industrial preparations. During the study it was observed that the success of breastfeeding depends largely on the method and the time when the mother begins to place the infant on her chest. In the survey 23 premature infants were subjected to tactile stimulation and the smell of milk in their very first days of life. They were placed on the chest to gradually get them accustomed to the breast even

though they were still not coordinated in swallowing and sucking. This proved to be a crucial way of eating after the child pulls on the bottle 120 ml/kg. In this group, after the child was fed enough milk from the bottle, they were placed on the chest and then fed only on the chest, even if at the beginning they started to lose weight. Of these 23 premature infants, breastfeeding was the only way to feed in 78% of cases. The remaining 41 premature infants were bottle-fed breast milk for a long period of time, partly due to medical complications or due to fear and distrust of the mother. In this group exhibited significantly less success in breastfeeding (only 12% of preterm infants). Applying the chi-square test shows a statistically significant correlation between the two groups (table 3).

## Discussion

There are scientifically based evidence on the benefits of breastfeeding for the health of children, mothers, families and society as a whole. It has been shown that breastfed children are healthier and rarely suffer from asthma, diabetes, or inflammation of the urinary and the respiratory systems. Breastfeeding also has benefits for mothers, as it reduces the risk of osteoporosis in later life. (3,4) The aim of the study was to show that the breastfeeding of low birth weight preterm infants can be set independently of medical complications provided there is major involvement by the mother and the medical staff.

In our study 36% of LBW premature babies were breastfed. We found better results in literature among preterm infants with gestational age below 28 weeks - about 41% (5), and higher than 80% among full term newborns, but these results contain all infants fed with mother's milk (even with a bottle). (6,7) One study based on questionnaires conducted by a Danish national cohort found 68% of the preterm infants who were breastfed. (8) Our preemies in the NICU have a short period of kangaroo skin-to skin contact, and the data from literature shows that this increases the duration of breastfeeding. (9)

**Table 3. Breastfeeding success considering to the transition to the chest**

	Sucking Number (%)	Doesn't suck Number (%)	Total Number (%)	p
When reach 120 ml/kg/day by bottle - next days only sucking	23 (36)	41 (64)	64 (100)	
When reach 120 ml/kg/day feeding combined - bottle and sucking	18 (78)	5 (22)	23 (36)	
	5 (12)	36 (88)	41 (64)	> 0.05

Many medical complications were identified during the study in preterm infants: respiratory distress syndrome, cerebral haemorrhage, asphyxia and infection. Processing data using chi-square test did not show statistical significance, these complications do not affect the success of breastfeeding. The results correspond to the research results from a study conducted in Rijeka. (10) It was observed that the success of breastfeeding depends largely on the method and time when the mother starts to put the baby on the breast. Children, who are long-time meals to the probe of bottle, if they are not putting on the chest, have failed to learn to suck. At first, just placing a baby on the breast, especially one born with a gestational age below 32 weeks, can be very frustrating for both the baby and the mother, since the baby can suck very hard. It may happen that a child cannot properly cover the nipple, or falls asleep as soon they are placed on the chest. In such situations it is important to not despair, and to provide a second chance to mother

and child. Breastfeeding should follow the child's head and shoulders, making sure you are in the line of his body. It is desirable to express a small amount of milk from the nipple so that the baby can smell and taste it. Sometimes it will take many attempts before the baby may open its mouth enough to be able to catch the breast and started to suck. An important role is played by tactile stimulation and early habituation to the breast, but proved to be the most important way of feeding once the child withdrew 120 ml/kg per vial. Success is lower if the child continues to feed from a bottle after having been bottle-fed 120 ml/kg. These results coincide with the results of research conducted in Brazil. (11) Success is lower if the child continues to feed from a bottle after having been bottle-fed 120 ml/kg. This happens because the mother is afraid about the weight of the baby, sometimes noticing that the baby "does not grow well". In the neonatal intensive care unit, further educational efforts are needed to address the specific breastfeeding

needs of parents with preterm infants. Mothers who deliver prematurely have not made a final decision on whether to breastfeed their infant and may not have the necessary information to make an informed decision. The clinical staff should discuss the benefits of human milk, including the long-term effects of exclusive breastfeeding. (2) Parents, especially mothers, should be supported by the medical staff to breastfeed their premature infants. (12) Further studies are needed because of the small number of LBW infants.

### Conclusion

Breastfeeding can be successfully established even with a very small preemie, and despite medical complications, if the mother chooses this and if she has some help from the medical staff. It was observed that placing a low birth weight preterm baby on the mother's chest is of great importance for the successful establishment of breastfeeding, and that duration of bottle-feeding also impacts the success rate for the establishment of breastfeeding.

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