



Nutrition, Weight Gain, and Length of Stay of the Nicu Infants Who were not Placed in their Mothers' Arms

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Abstract

Most neonatal deaths in the world occur in low- and middle-income countries. It is possible to prevent at least two-thirds of these deaths with the right approaches and breast milk. Setting and Sampling. One hundred infants, 59% male and 41% female, participated in the study. These babies were hospitalized in the Newborn Intensive Care Unit without being placed in their mothers' arms. Weight gain and hospitalization periods were followed according to the nutritional status of the babies. While 54% of the patients were fed only with breast milk, 42% were mixed-fed with a combination of breast milk and formula, and 4% of the patients who did not have mothers' milk were fed only with the formula. There was no statistically significant difference between the weight differences and rank averages of the babies according to the status of feeding ($U=108.5$, $p=0.142$). The discharge times of babies who are breastfed in the NICU are significantly higher than those who do not receive breastmilk. In other words, breastfeeding status in the NICU was found to affect the length of time that infants were hospitalized in the NICU ($U=62$, $p < 0.05$). This study examined the nutrition, weight gain and length of stay of NICU infants. Babies who are taken to intensive care without ever reaching their mother are a difficult group to evaluate. We have shown that even for NICU infants who are not placed in their mothers' arms, breast milk is quite superior in both weight gain and hospitalized stay. Early and advanced-pregnancies and cesarean births in all age groups, unfortunately, increase the risk of complications that may occur in the mother and baby after birth. The rapid weight gain of the baby with formula foods is not a health indicator.



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Introduction

The neonatal period covers the first 28 days of life. This first 28-day period is the period when the risk of death in children is highest. Neonatal deaths account for 45% of all under-five deaths worldwide. This means 2.7 million deaths every year¹

Most neonatal deaths in the world occur in low- and middle-income countries. Improving the survival and health of the newborn, it is possible to provide both prenatal and postnatal care for both mother and baby. It is possible to prevent at least two-thirds of these deaths with the right approaches and breast milk²

Every term-born baby loses extracellular fluid after birth, and its weight decreases by 4%-7%. This value should not exceed 10%-12%. It is easy to encourage breast milk and to control the baby's weight in healthy babies who are given to the mother's lap after birth, but babies who are transferred to the neonatal intensive care unit (NICU) without being placed in the mother's lap due to health problems constitute a more difficult group in terms of nutrition and weight gain. Additionally, breast milk affects the general health of the baby and the length of stay in the NICU³

This study examines the nutrition, weight gain status, and length of stay of infants transferred to the NICU without being placed in their mothers' arms until discharge.

Materials and Methods

Setting and Sampling

The research was conducted between January 1, 2018, and December 31, 2020, between 35 and 42. A total of 100 infants, 59 (59%) male, and 41 (41%) female, participated in the study. These babies are patients who were hospitalized in the Newborn Intensive Care Unit of Training and Research Hospital without being placed in their mothers' arms. The information is presented by following each baby's feeding method, food intake - residue amount, and anthropometric measurements.

To avoid intraobserver and interobserver differences, the measurements were taken with a single method (infantometer, food measuring cup, etc.) and averaged twice by a single researcher.

Statistical Analyses

The data obtained in the research were analyzed in a computer environment using SPSS 22 (Statistical Package for the Social Science for Windows).

Descriptive statistics are given as median, minimum and maximum values for data that are not normally distributed. The normality of the data was tested. The Mann-Whitney U test was applied for two independent groups that were not normally distributed. The Kruskal-Wallis test was applied for more than two independent groups that were not normally distributed. The relationship of the variables was tested with the Spearman correlation method. The level of significance was taken as 0.05 in the analyses.

Results

When the patients admitted to the Neonatal Intensive Care Unit are examined in terms of gender, 41% of the babies are girls and 59% are boys. (n=100)

It was determined that 1% of the births were premature births within the 35th week, and 13% of them were premature births within the 36th week. Forty percent of deliveries are due at 37 weeks, 33% are term at 38 weeks, 9% are term at 39 weeks, 3% are term at 40 weeks, and 1% are at 41 weeks. It was found that there was a term birth.

It was determined that 9% of the mothers of babies admitted to the Neonatal Intensive Care Unit were adolescent mothers under the age of 18, 52% were between the ages of 19-34 and 39% were over the age of 35.

Forty-seven percent of births were in the form of normal spontaneous delivery, and 53% of them were in the form of cesarean delivery.

Seven percent of the babies were found to be between 1500 and 2500 gr, 86% between 2500 and 4000 gr, and 7% over 4000 gr.

Four percent of babies' heights were between 47 and 48 cm, 15% were between 48 and 49 cm, 42% were between 49 and 50 cm, 19% were between 50 and 51 cm, 16% were between 51 and 52 cm, 3% and 1% were between 53 and 54 cm (Table 1).

Table 1: Distribution of Participants and their Birth Characteristics

Features	Frequency(n)	Percentage(%)
Gender		
Girl	41	41,0
Boy	59	59,0
In Which Week of Birth Occurred		
In 35th week	1	1,0
In 36th week	13	13,0
In 37th week	40	40,0
In 38th week	33	33,0
In 39th week	9	9,0
In 40th week	3	3,0
In 41th week	1	1,0
Mother`s age		
<18	9	9,0
19-34	52	52,0
>35	39	39,0
Type of delivery		
Normal spontaneous birth	47	47,0
Cesarean birth	53	53,0
Birth Weight		
1500-2500 gr	7	7,0
2500-4000 gr	86	86,0
>4000 gr	7	7,0
Height at Birth		
From 47 to 48 cm	4	4,0
From 48 to 49 cm	15	15,0
From 49 to 50 cm	42	42,0
From 50 to 51 cm	19	19,0
From 51 to 52 cm	16	16,0
From 52 to 53 cm	3	3,0
From 53 to 54 cm	1	1,0

Fifty-four percent of the reasons for infants to be hospitalized in the NICU without being placed in their mother's arms are neonatal transient tachypnea, 22% meconium aspiration, 17% asphyxia, and 7% respiratory distress.

The discharge weight of the patients was determined as a minimum of 2430 g and a maximum of 4360 g. The mean discharge weight was found to be 3201.50 ± 406.88 g.

While 54% of the patients were fed only with breast milk, 42% were mixed-fed with a combination of breast milk and formula, and 4% of the patients

who did not have mothers' milk were fed only with the formula.

None of the patients indicated prevented feeding. The mean hospitalization period of the patients was determined to be 4.07 ± 1.76 days.

During the hospitalization period, the mean height of the patients was 49.79 ± 1.13 cm (Table 2).

The Wilcoxon signed rank test was preferred instead of the dependent sample t test since the assumption of normality was not provided to determine the difference between the weights of infants at

admission to the NICU and the weights of their discharge from the NICU. As a result of Wilcoxon Reverse Ranks, a statistically significant difference was found between the weight of the babies when they were admitted to the NICU and the weights

at the time of discharge from the NICU ($z=-4.917$, $p=0.000$). Accordingly, a statistically significant increase in weight was observed in infants who received NICU care without being placed on the mother's lap (Table 3).

Table 2: Distribution of Characteristics of the Neonatal Intensive Care Unit (NICU) During and After Hospitalization

Features	Frequency (n)	Percentage (%)
Reason for Admission to NICU without being placed in mother's arms		
Asphicks	17	17,0
Meconium Aspiration	22	22,0
Respiratory Difficulty	7	7,0
Transient tachypnea of the newborn	54	54,0
Weight at NICU admission		
1500-2500 gr	6	6,0
2500-4000 gr	87	87,0
>4000 gr	7	7,0
Number of days spent in NICU		
1 Day	2	2,0
2 Days	19	19,0
3 Days	29	29,0
4 Days	5	5,0
5 Days	27	27,0
6 Days	1	1,0
7 Days	17	17,0
Nutritional Status in NICU		
Breast milk only	54	54,0
Breast milk and formula food	42	42,0
Formula food only	4	4,0
Whether You Have a Condition, That Prevents Nutrition		
Yes	0	0
No	100	100,0
Weight of Discharge from NICU		
1500-2500 gr	5	5,0
2500-4000 gr	89	89,0
>4000 gr	6	6,0
Baby's Height at the Time of Discharge from the NICU		
From 47 to 48 cm	4	4,0
From 48 to 49 cm	15	15,0
From 49 to 50 cm	41	41,0
From 50 to 51 cm	20	20,0
From 51 to 52 cm	16	16,0

The Mann-Whitney test was preferred instead of the independent sample t test since the normality assumption was not provided for the relationship

between breastfeeding status and the weight differences of the infants in the NICU. As a result of the Mann-Whitney test, there was no statistically

significant difference between the weight differences and rank averages of the babies according to the status of breastfeeding in the NICU. (U=108.5, p=0.142). In other words, breastfeeding status in the NICU had no effect on the weight differences (gr) of the babies (Table 4).

The discharge times of babies who are breastfed in the NICU are significantly higher than those who do not receive breastmilk. In other words, breast feeding status in the NICU was found to affect the length of time that infants were hospitalized in the NICU (U=62, p < 0.05) (Table 4).

Table 3: Comparison of the NICU hospitalization weights and NICU discharge weights of infants

Variables	Average weight	Standard Deviation	Rank Status	Number	Rank Mean	Rank Total	Z	p
NICU hospitalization weight (gr)	3108,30	390,11	T<Y	34	26,54	902.50	-4,917	0.000
NICU discharge weight (gr)	3201,50	406,88	T>Y	59	58,79	3468.50	T=7	7

Table 4: The relationship of breastfeeding status in the NICU with the weight differences (gr) of the babies

	Category	N	Mean	Standard Deviation	Rank Average	Rank Total	Mann–Whitney U	p
Difference in weight	Breastfed*	96	97,60	164,71	51,37	4931,50	108,5	0,142
	Not Breastfed	4	-12,50	42,72	29,63	118,50		
Hospitalized time	Breastfed*	96	4,15	1,75	51,85	4978	62	0,019
	Not Breastfed	4	2,25	0,50	18,00	72		

* Breastmilk only or Breastmilk + Formula

Discussion

Due to insufficient uterine blood supply in adolescent pregnancies, LBW (low birth weight) poses risks such as mortality in terms of infant health.^{4,5,6,7} In our study, when the distribution of mothers by age categories was analyzed, it was determined that 9% of them were under the age of.¹⁸ This rate was determined to be 5.3% in the TDHS 2018 data.⁸

There is a relationship between the mode of delivery and the baby's first food intake of breast milk. In normal births, the rate of breastfeeding as the first food is higher than the rate of formula feeding.⁹

Reasons such as advanced gestational age, fears of mothers about normal delivery, increased demands for cesarean section to evaluate fetal well-being, and medical developments in the evaluation of fetal well-being play an important role in the increase in cesarean section rate. Cesarean section is the most common surgical operation in the world.¹⁰

Selection of anesthesia type in the Obstetric Anesthesia Guidelines of the American Society of Anesthesiology (ASA) should be done according to the fetal need and the preference of the mother or the anesthetist. In the study of Akıcı Ç., it was seen that spinal anesthesia was preferred with a rate of 51.9% and general anesthesia with a rate of 48.1%.¹¹

Resuscitation at birth is an approach used in the absence or cessation of respiratory or cardiac functions.¹² In the study of Sütçüoğlu *et al.*, the number of patients who underwent resuscitation at birth was 5.46%.¹³

In our study, postnatal resuscitation was applied to 15% of the patients who were hospitalized in the Neonatal Intensive Care Unit without being placed on the lap of their mothers, while resuscitation was not required for 85%. In the study of Sütçüoğlu S., it was seen that most of the patients who underwent resuscitation were premature and had LBW.¹³

The Newborn Resuscitation Guide of the World Health Organization states that approximately 25% of all neonatal deaths are caused by birth asphyxia.¹⁴ In our study, 60% of the patients who underwent resuscitation were diagnosed with meconium aspiration (n=9), approximately 26% with asphyxia (n=4), and approximately 13% with the diagnosis of neonatal transient tachypnea (n=4). He was admitted to the Neonatal Intensive Care Unit.

When the diagnoses of the patients admitted to the Neonatal Intensive Care Unit were examined, 17% (n=17) had asphyxia, 22% (n=22) had meconium aspiration, 7% (n=7) had respiratory distress, and 54% had neonatal temporary tachypnea of the newborn (TTN). In the study of Helvacı H., when the indications for hospitalization were examined, 76.7% of them had respiratory distress, and 2% of them had asphyxia. It was observed that 95.6% of the patients hospitalized with the diagnosis of respiratory distress had TTN.¹⁵ In the study, 42% of the hospitalizations in the NICU were due to prematurity, and 11% were due to LBW.¹⁶ In the study of Horn A., while hyperbilirubinemia was 37.1%, neonatal sepsis was 31.2%, asphyxia was 6.6%, and meconium aspiration was 4.6%.¹⁷ The reason why the rate of respiratory problems was so high in our study is that the babies we included in the study were only taken to the NICU without being placed in the mother's arms, and this was only seen in the case of respiratory problems. In the study of Emran Yakar, 92% of the patients who were admitted to the NICU were hospitalized directly from birth due to respiratory problems, as in our study.¹⁸⁻¹⁹

When the relationship between the weight of the babies at the time of admission to the NICU (gr) and the weight of the babies to be discharged from the NICU was examined, it was observed that there was a statistically significant relationship between the weight of the babies at the time of admission to the NICU and the weight of the discharge from the NICU ($r(100)=0.844$, $p < 0.05$). In Aydın's study, no statistically significant increase was observed between the admission and discharge weights of the patients admitted to the NICU,¹⁹ while in the study of Rodrigo RF., there was a significant difference between the weights of admission and discharge

from the NICU 20. In the study of Namiro F,²⁰ it was stated that discharge occurred without catching birth weight, as in Aydın's study.¹⁹

When the relationship between the weight differences (gr) of babies who received only breast milk or only formula in the nutrition type categories in the NICU was examined, no statistically significant difference was found between the rank averages of the weight differences of the babies according to the type of feeding in the NICU ($H(2)=2.211$, $p = 0.331$). The weight gain of breast milk and formula is similar.

Regarding the relationship between the duration (days) of the babies hospitalized according to their breastfeeding status in the NICU, a statistically significant difference was found between the rank averages of the time (days) the babies were hospitalized in the NICU according to the status of receiving breast milk in the NICU., $p < 0.05$). Breast milk prolongs hospital stay. The reason for this is effective breastfeeding in the Newborn Intensive Care Unit of Kırklareli Training and Research Hospital.

Conclusions

Early and advanced pregnancies and cesarean births in all age groups, unfortunately, increase the risk of complications that may occur in the mother and baby after birth. The rapid weight gain of the baby with formula foods is not a health indicator. Society should be educated on the right age, the right diet, and the indisputable superiority of breast milk.

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Conflict of Interest

The authors do not have any conflict of interest.

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