

THE IMPACT ON THE STATE OF HEALTH DUE TO THE SEPARATION OF MOTHER/INFANT

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Abstract

Introduction: Early maternal/infant separation can result in a series of traumatic emotional reactions from both the newborn and the mother. **Material and methods:** The authors propose conducting a study on the influence of mother/newborn separation in a neonatology and premature department. To undergo the study, a questionnaire was prepared and distributed both to mothers admitted separately from newborns and to mothers admitted in the same ward as newborns. The study included a group of 60 mothers, the group being divided into two groups: separated mothers/newborns and unseparated mothers/newborns. **Results:** The study reported that the separated mothers/newborns group had an average hospital stay of more than 10 days compared to the group of unseparated mothers/newborns where the average duration of hospitalization was 7 days. 83.3% of unseparated newborns had a favorable clinical course and only 6.67% had complications. In the group of separated newborns, 40% had a favorable evolution and 30% had complications. Regarding the behavioral changes occurred in the newborns, comparing the results of the two groups, it appears that the group of separated newborns showed the most behavioral changes. The most common were crying (66.7%), followed by decreased appetite (13.3%), sleep disorders (10%) and weight loss (6.67%). The most common behavioral changes seen in mothers were decreased / lost of milk, anxiety states and sleep disorders. **Conclusions:** Maternal-infant separation has not only a negative impact on the child, but also on the mother with both short- and long-term effect.

Keywords: mother-infant separation, neurodevelopmental risk, breastfeeding, maternal separation anxiety

Introduction

The transformation that a woman goes through to bring a child into the world is the most complex and common developmental event in the entire human experience.

Establishing a relationship between mother and newborn is a vital process that begins in the womb and continues for several postpartum months. The newborn is prepared from the first minutes to create the bond with the mother, but for the mother feelings evolve in a different way [1].

Since the 20th century, the hospital has become in most developed countries the main birthplace. In this new practical situation, newborns are kept separately in newborn wards. Since 1991, following the initiative of UNICEF and the WHO, the friendly hospitals for newborns have been designed, being included the notion of rooming-in (mothers and newborns are together in the ward 24 hours a day) [2].

There are situations in which the mother-child connection cannot be achieved from the moment of birth due to an acute suffering of the newborn, being necessary to hospitalize him in a suitable hospital compartment, implicitly with the separation of the mother in the first weeks/months of life.

Maternal and infant separation is an important and topical issue because most pathological neonatology departments, and especially Neonatal Intensive Care Units, are set up in such a way that the child is separated from the mother during hospitalization. The access of the mothers is made at a regular time interval, under certain conditions of hygiene and for a short period of time.

Aims of the study

The authors aim to achieve a study on the influence of mother / newborn separation in a neonatology and premature clinic. We looked at how separation emotionally affects both the mother and the newborn. Another aspect to consider is the influence that separation has on the clinical evolution of the newborn. At the same time we will try to highlight the positive impact of keeping the mother / newborn binomial during hospitalization.

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Materials and Methods

The study was performed in the Neonatology and Premature Clinic of the Emergency Clinical Hospital for Children "Louis Țurcanu" in Timișoara.

In order to carry out the study, a questionnaire was drawn up, which was distributed both to mothers hospitalized separately from newborns and to mothers hospitalized in the same ward as their child. The study involved a group of 60 mothers admitted to the clinic between 2020 and 2021. Of these, 30 were hospitalized separately from the newborns, having access to a regular time interval for a short period of time, the remaining 30 mothers being hospitalized in the same ward with their children in permanent contact with them.

From the questionnaire distributed to the mothers, the following questions were considered to be the most relevant for the study:

1. What was the average duration of hospitalization?
2. What was the child's clinical development during the hospitalization?
3. Have you noticed any different behavior in your child?

4. Have any change occurred in your case?

All responses received were analyzed. The total group of mothers/ ewborns studied was divided into two groups: separated mothers/newborns and unseparated mothers/newborns.

Finally, the two groups were compared in order to be able to establish the impact that the maternal-infant separation has on the newborn and the mother. The average duration of hospitalization between the two groups was compared using the unpaired T test in order to obtain the statistical p value. The value of $p < 0.05$ was considered statistically significant. The chi-square test was used to compare the clinical evolution of newborns separated from mothers with those not separated from mothers.

Results

The following results were obtained from the analysis of the answers provided by the 60 mothers.

The question, "What was the average duration of hospitalization?" in the analysis performed is a very important variable because it can reveal how the separation negatively influences this duration (Table 1).

Table 1. Average days of hospitalization of newborns.

	<7 days n (%)	7-10 days n(%)	>10 days n (%)	p-value
Separated mothers / newborns (n=30)	6 (20%)	7 (23.3%)	17 (56.7%)	p <0.001
Unseparated mothers / newborns. (n=30)	25 (83.3%)	5 (16.7%)	0 (0%)	

The group of separated mothers/newborns had mainly an average duration of hospitalization of more than 10 days compared to the group of unseparated mothers/newborns where the average duration of hospitalization was mainly 7 days. Given the p value <0.001 resulting from the comparison of the two groups, it appears that the difference is extremely significant from a statistical point of view, this confirming the negative impact that maternal-infant separation has on the newborn. A shorter period of hospitalization is a beneficial factor for both the baby and

the mother, being important that the newborn returns as soon as possible to the familiar environment for further harmonious development.

The second question of the study was "What was the child's clinical development during the hospitalization?". Even if this variable is also influenced by the pathology that the newborn has, respectively acute or chronic, it must be taken into account when comparing the evolution of the newborn separated from the mother with that of the newborn that is not separated from the mother (Table 2).

Table 2. Clinical evolution of hospitalized newborns.

	Favorable n (%)	Progressive n (%)	Complications n (%)	p-value
Separated mothers / newborns (n=30)	12 (40%)	9 (30%)	9 (30%)	p <0.0024
Unseparated mothers/newborns (n=30)	25 (83.3%)	3 (10%)	2 (6.67%)	

The highest percentage (83.3%) of newborns who had a favorable clinical evolution was recorded in newborns not separated from mothers compared to that of separated newborns, which was only 40%. The result obtained highlights a very important aspect: most children who are not separated from mothers get over the episode of illness faster and do not develop complications that can endanger their health. Even though 10% of newborns not separated from mothers have had a progressive evolution, the result is incomparably lower than the group of separated newborns.

The things that can lead to such a high percentage of children with a favorable evolution are multiple, but the most important is the active involvement of the mother in the care of the child.

From a statistical point of view, following the application of the chi-square test, the value of p is 0.002451, the result having a statistically significant value. The result of this test only confirms again the idea of the study, namely that maternal-infant separation has a negative effect on the clinical and emotional evolution of the newborn.

Regarding the changes in the behaviors of the child, the mothers answered the question "What changes in behavior have you noticed in your child?". Within our ward, even if the mothers are hospitalized separately from the child, they have the right to enter the newborn's ward at the time of feeding. In those moments they can observe the behavior

different from normal and signal the changes that have occurred. It was considered the easiest to notice the changes related to crying, appetite, sleep disorders and weight loss. It is important to note that mothers had the opportunity to choose several options (Table 3).

Table 3. Behavioral changes of newborns.

	Crying more often/stronger n (%)	Whimsical appetite n (%)	Sleep disorders n (%)	Loss weight n (%)	„I did not notice a different behavior in the baby” n (%)
Separated newborns (n=30)	20 (66.7%)	4(13.3%)	3(10%)	2 (6.67%)	1 (3.3%)
Unseparated newborns (n=30)	1 (3.3%)	6 (20%)	1(3.3%)	0 (0%)	22 (73.3%)

Comparing the results of the two groups, it appears that the group of unseparated newborns shows fewer behavioral changes, which is due to the fact that any baby feels safe with his own mother and the relationship between the two can overcome the changes in the environment and the routine at home. In the hospital the child is given medication, meals are at fixed hours, including the crib in which he sleeps is different. All these changes could lead to behavioral changes, but according to the responses received from mothers, unseparated newborns have adapted more easily compared to separated ones.

In the group of newborns separated from mothers, the most frequent changes were crying (66.7%), followed by

whimsical appetite (13.3%), sleep disorders (10%) and weight loss (6.67%). These percentages indicate the negative impact that maternal-infant separation has on the emotional state of the child and the unfavorable evolution of the disease. The appearance of capricious appetite can be related to the breastfeeding that is interrupted and the child is fed with milk formula during the hospitalization, which makes him refuse the milk he needs.

The last question of the study was related to the changes that the mother noticed in her. The most common changes reported were decreased/loss of milk, anxiety states and sleep disturbances (Table 4).

Table 4. Behavioral changes in the case of mothers.

	Decreased/lost of milk, (%)	Anxiety states n (%)	Sleep disorders n (%)	„No changes have occurred in my case” n (%)
Separated mothers (n=30)	18 (60%)	6 (20%)	5 (16.7%)	1 (3.3%)
Unseparated mothers (n=30)	0 (0%)	5 (16.7%)	1(3.3%)	24 (80%)

In the group of mothers separated from newborns, anxiety and sleep disorders occur in similar percentages 20% respectively 16.7%, which suggests that separation from their own child can lead to a generalized anxiety disorder. One thing that can help mothers better manage their emotional state is to build a strong relationship with their child's doctor. The doctor must provide them with information that is easy to understand for their level of education, about their child's condition and encourage their visits because only in this way can they establish a connection with their own child.

Discussion

Maternal-infant separation for newborns has been the standard of care since the last century, which is constantly changing following new studies. The endowment of the Neonatal Intensive Care Units with state-of-the-art technology allowed the survival of low birth weight preterm infants and full-term newborns with various serious

pathologies. On long term, however, these particularly vulnerable newborns, following separations from their mothers, showed varying degrees of deficiency in psychosocial development [3]. Poor results are largely attributed to toxic stress. It is defined as the absence of protection and support provided by adults, implicitly by the mother. Understanding toxic stress comes from discoveries about our genome and epigenetics, microbiome, neuroscience of brain development and connections. This may also explain the increased incidence of cognitive and neural developmental disorders in children who have been separated from the mother [4].

The medical world is an absolute supporter of the concept of mother-infant binomial and does its best to form a close bond from the very first moments through skin-to-skin contact, and then through all the gestures they make for better communication [5]. Encouraging this practice over the years has led to numerous medical records that further outline the fact that from birth the child manages to

communicate with his mother through the simplest gestures, and the mother manages to transmit to him all the emotions she goes through [6].

In the current context of the COVID-19 pandemic, numerous studies have been carried out to establish whether the positive mother should be separated from the newborn and whether this is a benefit or not. The fact that not much was known about the transmission of this virus made things very strict so that there was no risk of transmission of infection between the mother and the newborn. The Center for Disease Control and Prevention (CDC) advised that institutions "temporarily consider separating the mother from her child" until the mother was no longer considered contagious [7]. A study published at the end of March 2020 on 33 children born in Wuhan, China, whose mothers had COVID-19 with a positive test for SARS-CoV-2, showed that separation does not prevent infection of the newborn [8]. The World Health Organization puts the care of the newborn by the mother and does not recommend their separation: newborns and mothers with suspected or confirmed COVID-19 being allowed to stay together and practice skin-to-skin contact, different types of care like "Kangaroo-care" and to accommodate to each other during hospitalization [9].

From birth, the child has the ability to feel the stimuli of the environment in which he is located, this influencing the interaction between mother and child. If this interaction is interrupted, especially if the newborn needs care in a neonatal intensive care ward, his or her emotional development can be negatively influenced.

In our study, were noted numerous behavioral changes at the newborns from the separated mothers/newborns group, the most common being sleep disorders, crying more often and capricious appetite. In a study conducted in 2011 by Morgan BE and collaborators, the baby's heart rate and crying were monitored for an hour when he is separated and sleeps alone. The values of these parameters were then compared with the values obtained when the child sleeps in the arms of the mother. The conclusion of the study reveals an increase in heart rate and crying during sleep, due to the separation from the mother, and this behavioral change are caused by the central anxiety the child experiences [10]. Another study focuses on the respiratory and cardiac function of the newborn, as well as the level of glucose in the blood. According to the study, infants separated from their mothers had a higher heart and respiratory rate and lower blood glucose levels [11].

If the newborns have behavioral disorders due to separation from mothers, in the mothers it is found that separation from the child, especially if he is hospitalized in an Intensive Care Unit can be a predisposing factor of behavioral modifications. Any mother is worried when the child is sick, but mothers separated from the child feel this concern at a much higher level. The "fear" about the dangers to which the child may be exposed, the fact that they are not with him, they cannot care for him, they cannot ensure his comfort, are emotional stressors for them. Most commonly these mothers experience anxiety and sleep disorders [12].

Comparing the two groups of the study, the higher percentage of anxiety and sleep disorders was observed in the group of mothers hospitalized separately from the newborns. Mörelius E. and collaborators conducted a study on a group of 17 mothers whose children were premature, concluding that separation is a stress factor for mothers. When mothers held their premature babies to the chest in the Neonatal Intensive Care Unit, heart rate, salivary cortisol levels and stress scores decreased [13]. Separated mothers feel excluded from the process of caring for the newborn, which is responsible for the appearance of the feeling of powerlessness, some mothers also reaching the feeling of not feeling like mothers, even if intellectually they are aware that they have a child [14].

The feeling of exclusion is by far the most studied thing because many of the mothers separated from their child are experiencing it. The lack of interaction between the mother and the medical staff makes her imagine all kinds of scenarios and raise the suspicion of "What do doctors do with my child in my absence?". The fact that they feel powerless, homeless, desperate, disappointed further reinforces the belief that any medical team caring for a child separated from the mother must include her and communicate with her as much as possible [15].

Another change noticed in the group of mothers studied was the decrease/loss of milk. The fact that 60% of mothers hospitalized separately have experienced a decrease/loss of milk is a problem with long-term effects on the healthy development of the newborn. This disorder is given by the fact that during the period of separation lactation is no longer stimulated by the attachment of the baby to the breast, and the use of an artificial pump does not replace this interruption. A child who is put to the breast on demand and feeds properly will stimulate the mammary gland and implicitly the secretion of prolactin, in this way lactation is not lost [16]. In contrast, in the group of mothers not separated from their own child, none of them lost lactation, which demonstrates everything that was specified above.

Studies in the literature prove that the decrease in the duration of breastfeeding is a risk factor for serious pathologies that require hospitalization. A study on infants with pneumonia demonstrated that infants who were not breastfed have a 3.6 times higher risk of being hospitalized for pneumonia compared to infants who have been exclusively breastfed for more than 4 months [17]. Separating the mother from the newborn immediately after birth can make the baby more vulnerable to severe respiratory infections, including COVID-19, in the first year of life [18]. Our study demonstrates that the average length of hospitalization is longer in the group of separated newborns compared to the group of the unseparated.

It is important for the medical world to understand the major role of preserving the mother-child binomial and to find various solutions so that the bond of the two is not completely interrupted.

An ideal way of caring for the newborn even in the hospital period would be the active participation of the father, which is difficult to achieve, but not impossible. It is necessary to implement programs especially in preterm

wards that involve both parents in the process of care and stimulation of the child. They can achieve auditory stimulation by talking to him or her or reading short stories, as well as physical stimulation by gently touching the newborn. The development of the brain is an interactive process, the child smiles, the mother smiles back at him and caresses him. Thus, each small gesture contributes positively to a state of psychological health that the child will have in the future. The positive impact of this is also evident in our study, which means that this behavior must be further encouraged and instituted in all possible situations.

Conclusions

Maternal-infant separation has not only a negative impact on the child, but also on the mother. Disorders

arising from separation can lead to complications in both the short and long term, so this should be avoided as much as possible. Newborns, mothers and their families have the right to high-quality care. High quality on the care of the newborn includes the ability to stay with the parents. The implications of the different practices performed during the hospitalization period are reflected in the health of the child upon discharge and illustrate the importance of a positive experience. More future research is needed and current practices need to be improved to provide newborns with the standard of care they deserve.

Conflict of interests

The authors declare no conflicts of interest regarding the publication of this article.

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