

PROFILE OF NEWBORNS UNDERGOING EARLY STIMULATION IN A NEONATAL INTENSIVE CARE UNIT

Perfil dos recém-nascidos submetidos à estimulação precoce em uma unidade de terapia intensiva neonatal

Perfil de los recién-nacidos sometidos a la estimulación precoz en una unidad de cuidados intensivos neonatal

Original Article

ABSTRACT

Objective: To describe the profile of newborns undergoing early stimulation in a neonatal intensive care unit, characterizing the study population according to their neonatal variables and risk factors indicative for the early stimulation treatment. **Methods:** Cross-sectional and analytical study, held in a reference hospital of Fortaleza, in the period from February to March 2011, with sample consisting of 116 medical records of newborns indicated for the early stimulation treatment. The following variables were analyzed: weight, sex, gestational age, Apgar score, diagnosis of Respiratory Distress Syndrome and Intracranial Hemorrhage, use of mechanical ventilation and continuous positive airway pressure (CPAP). The variables were analyzed using Microsoft Excel™ 2007 software to obtain mean and mode. **Results:** Among the studied variables, there was a prevalence of low birth weight, prematurity and male newborns. According to the Apgar score, scores of 1st and 5th minutes showed increasing values. Regarding the studied pathologies, the Respiratory Distress Syndrome stands out as the most prevalent, followed by Intracranial Hemorrhage. Concerning the use of mechanical ventilation, CPAP was the most frequently indicated modality, followed by mechanical ventilation. **Conclusion:** The profile of newborns investigated in this study, which underwent early stimulation in a neonatal intensive care, is represented by male, premature, low weight and high rate of Apgar score at 1st and 5th minutes, with prevalence of respiratory distress and increased use of CPAP.

Descriptors: Infant; Newborn; Intensive Care Unit; Neonatology.

RESUMO

Objetivo: Descrever o perfil dos recém-nascidos submetidos à estimulação precoce em uma unidade de terapia intensiva neonatal, caracterizando a população do estudo segundo suas variáveis neonatais e fatores de risco indicativos para o tratamento de estimulação precoce. **Métodos:** Estudo do tipo transversal e analítico, realizado em hospital de referência de Fortaleza, no período de fevereiro a março de 2011, cuja amostra constou de 116 prontuários de recém-nascidos indicados para o tratamento de estimulação precoce. Analisaram-se as seguintes variáveis: peso, sexo, idade gestacional, índice de Apgar, diagnóstico de síndrome do desconforto respiratório e de hemorragia intracraniana, uso de ventilação mecânica e pressão positiva contínua das vias aéreas (CPAP). As variáveis foram analisadas pelo programa Microsoft Excel® 2007 para obtenção de média e moda. **Resultados:** Das variáveis estudadas, houve um predomínio do baixo peso ao nascer, prematuridade e sexo masculino. Segundo o índice de Apgar, os escores do 1º e do 5º minutos mostraram valores ascendentes. Quanto às patologias estudadas, destaca-se a síndrome do desconforto respiratório como a mais prevalente, seguida da hemorragia intracraniana. Com relação à utilização do suporte ventilatório, o CPAP apresentou-se como a modalidade mais indicada, seguida da ventilação mecânica. **Conclusão:** O perfil dos recém-nascidos investigados no presente estudo, submetidos à estimulação precoce em uma unidade de terapia intensiva neonatal, é representado pelo sexo masculino, prematuro, com baixo peso e índice de Apgar elevado no 1º e 5º minutos, com prevalência da síndrome do desconforto respiratório e aumento do uso da pressão positiva contínua das vias aéreas.

Descritores: Recém-Nascido; Unidade de Terapia Intensiva; Neonatologia.

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RESUMEN

Objetivo: Describir el perfil de los recién-nacidos sometidos a la estimulación precoz en una unidad de cuidados intensivos neonatal, caracterizando la población del estudio según sus variables neonatales y factores de riesgo indicativos del tratamiento de estimulación precoz. **Métodos:** Estudio del tipo transversal y analítico realizado en un hospital de referencia de Fortaleza entre febrero y marzo de 2011 con una muestra de 116 historias clínicas de recién-nacidos indicados al tratamiento de estimulación precoz. Las siguientes variables fueron analizadas: peso, sexo, edad gestacional, índice de Apgar, diagnóstico de síndrome de incomodidad respiratoria y de hemorragia intracraniana, el uso de ventilación mecánica y presión positiva continua de las vías respiratorias (CPAP). Las variables fueron analizadas con el programa Microsoft Excel® 2007 para la obtención de la media y moda. **Resultados:** De las variables estudiadas hubo el predominio de bajo peso al nacer, prematuridad y sexo masculino. En el índice de Apgar, las puntuaciones del 1° y 5° minutos mostraron valores ascendientes. Respecto las patologías estudiadas, el síndrome de incomodidad respiratoria se destaca como el más prevalente, seguido de la hemorragia intracraniana. Respecto la utilización del soporte ventilatorio, el CPAP se presentó como la modalidad más indicada, seguida de la ventilación mecánica. **Conclusión:** El perfil de los recién-nacidos investigados en este estudio sometidos a la estimulación precoz en una unidad de cuidados intensivos neonatal está representado por el sexo masculino, prematuro, con bajo peso y índice de Apgar elevado en el 1° y 5° minutos, con prevalencia del síndrome de incomodidad respiratorio y aumento del uso de la presión continua de las vías respiratorias.

Descriptor: Recién Nacido; Unidades de Cuidados Intensivos; Neonatología.

INTRODUCTION

The increase in life expectancy of newborns at risk hospitalized in the neonatal intensive care unit (NICU) is the subject of study in Neonatology and several related areas, being a major challenge to public health⁽¹⁾.

The newborn at risk, focus of care at the NICU, is one that has undergone complications in pregnancy, pre or postpartum period, liable to damage structures of the central nervous system (CNS), which is not yet fully developed in functional and anatomical terms, thus may suffer changes in its development⁽²⁾. There are several risk factors that affect the quality of life of newborns in the NICU, among which are mentioned: conditions at birth (birthweight, gestational age, Apgar score, gender), conditions associated with this period, use of ventilatory modalities, among others⁽²⁾.

The probability of the newborn to express changes in their motor, cognitive and psychosocial abilities increases with the presence of these risk factors^(3,4). Thus, to perform

early intervention in the developmental delays, it is indispensable the early identification of neurodevelopmental disorders, which may trigger limitations in the functional acquisitions of these children^(5,6).

Early stimulation consists in planning specific psychomotor techniques for each age group, through the teaching of sensory stimuli that influence the child to have more interaction with their environment, according to their constitution, with freedom of expression for all their perceptions. These activities are consolidated with the execution of sensory integration activities that are incorporated in sensorimotor programs.

Early stimulation is an important tool to determine the appropriate stimuli and training in early years of life, in order to ensure the child as normal as possible evolution. Defining how will the child be and what capacity they will develop in the course of their existence, this process will favor the mother-infant interaction, seeing it as a basis for developing the potential and the remaining senses^(7,8).

In this context, it becomes relevant to investigate this population at risk. Since national and regional data on perinatal care and the profile of newborns undergoing early stimulation are still scarce, and given the changes that have been taking place in the epidemiologic profile of these children due to the continuous incorporation of new therapeutic techniques in the area of neonatology, it is necessary to know the changes that have been affecting the profile of infant morbidity.

The aim of this study was to describe the profile of newborns undergoing early stimulation in a neonatal intensive care unit, characterizing the study population according to their neonatal variables and risk factors, indicative for the early stimulation treatment.

METHODS

This is a cross-sectional analytical study, conducted between February and March 2011, in a public educational hospital of high complexity, recognized by the Ministry of Education (MEC) and the Ministry of Health (MOH), a reference in Fortaleza in the areas of Medicine, Surgery, Gynecology, Obstetrics and Neonatology.

Were used as inclusion criteria the medical records of newborns admitted to the NICU, which had an indication for early stimulation in the period from July to December 2010. During this period, 2,614 births occurred, with 2,511 (96.0%) live births and 103 (4.0%) stillbirths. Were transferred to the NICU 1,259 (48.1%), with 59 (2.2%) deaths in this sector.

Exclusion criteria were: medical records that did not have an indication for early stimulation, incomplete records

regarding the variables of the study and infants with any congenital malformation, totaling 123 records, of which 7 were excluded. Of the 123, the sample consisted of 116 records, a percentage of 9.2% of inmates in the NICU during the study period. Data was collected from the discharge report, attached to the medical records.

Analyzed variables: weight⁽⁹⁾, gestational age (GA)⁽¹⁰⁾, Apgar score, sex, diagnosis of respiratory distress syndrome (RDS) or intracranial hemorrhage (ICH) and the use of ventilation modes, such as mechanical ventilation (MV) and continuous positive airway pressure (CPAP).

The information was presented in absolute numbers and simple frequency. For the analysis of Apgar score, the statistical program Graph Pad Prism™, version 5.00, was used, with the Wilcoxon Signed Rank Test, through which were obtained mean, median and margin of error of the studied variable, with a significance level of $p < 0.05$.

The study was approved by the Research Ethics Committee from the General Hospital Dr. César Calls (HGCC), through opinion No. 463/2011.

RESULTS

In Table I, the distribution of newborns according to birth weight, gestational age and sex is observed, showing an ascendancy of newborns with low birth weight, followed by a significant reduction in the normal body weight. As for the GA, prematures were preponderant, totaling 91.2% ($n = 106$). There was a marked reduction of newborns at term and post-term. Regarding sex, there was a predominance of male over female.

In Figure 1, newborns are characterized according to the Apgar score, showing a high mean in the 1st and 5th minutes. The margin of error for the 1st minute was around

Table I – Newborns' characterization according to birth weight, gestational age and sex, in NICU of HGCC. Fortaleza-CE, 2011.

| Variables | Frequency | | Analysis Pattern |
|-----------------|-----------|-------|----------------------------|
| | n | % | |
| WEIGHT | 116 | 100.0 | |
| Low weight | 104 | 89.6 | 500 to 2.499g |
| Normal weight | 12 | 10.3 | 2.500 to 3.999g |
| GESTATIONAL AGE | | | |
| At term | 9 | 7.7 | 37 to 41 week |
| Preterm | 6 | 5.1 | 36 weeks and 6 days |
| Extreme preterm | 39 | 33.6 | 22 to 31 weeks |
| Late preterm | 61 | 52.5 | 32 to 36 weeks |
| Post-term | 1 | 0.8 | Above or equal to 42 weeks |
| SEX | | | |
| Male | 63 | 54.3 | - |
| Female | 53 | 45.6 | - |

Table II - Newborns' characterization according to the conditions and ventilatory assistance adopted, in NICU of HGCC. Fortaleza-CE, 2011.

| Variables | Frequency | | | |
|-----------|-----------|------|-----|------|
| | Yes | | No | |
| | n | % | n | % |
| RDS* | 99 | 85.3 | 17 | 14.6 |
| ICH** | 5 | 4.3 | 111 | 95.6 |
| MV*** | 55 | 47.4 | 61 | 52.5 |
| CPAP**** | 81 | 69.8 | 35 | 30.1 |

*Respiratory distress syndrome; **Intracranial hemorrhage; ***Mechanical ventilation; ****Continuous positive airway pressure.

0.1870; after 5 minutes, it was 0.1173. Median of 7.0 for the 1st, and 9.0 for the 5th minute, with the significance level $p < 0.05$.

In Table II, the newborns' characteristics are presented according to the conditions and ventilatory assistance adopted. There was a prevalence of RDS, while the ICH showed a significant reduction. Regarding ventilatory modalities, the use of MV diminished, associated with increased use of CPAP.

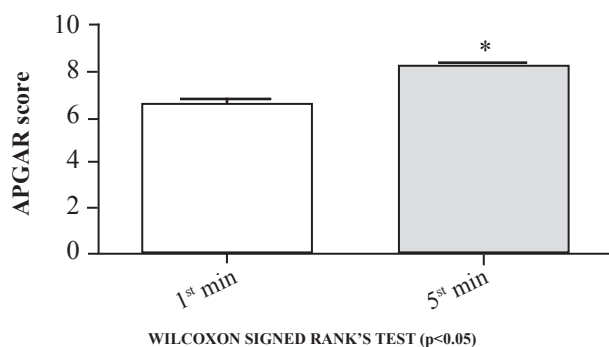


Figure 1 - Newborns' characterization according to the Apgar score in UTIN of HGCC. Fortaleza-CE, 2011.

DISCUSSION

Prematurity and its neonatal variables relating to the risk factors may determine the predominant child development in Brazil, which will be considered indicators of the populations' health status⁽¹¹⁾. Therefore, the present study sought to characterize the study population according to their neonatal variables, thus, knowing the neonatal risk factors that are indicative for early stimulation treatment. This relationship between the newborns' characteristics and biological risk factors has been widespread in the literature.

Low birth weight and prematurity are configured as risk factors, due to the vulnerability of the infant population, especially in the first months of life, namely, the lower the weight and gestational age, the greater the likelihood of morbidity. In this perspective, the high incidence of low birth weight and prematurity are public health problems for many countries, being present in those with less favored socioeconomic conditions, as in the case of Brazil⁽¹¹⁾.

In the present study, an upward increase of newborns with low birth weight and prematurity was observed, setting up worrying data, because this population at risk grows every day, proportionally to its life expectancy, increasingly requiring specialized care.

Results similar to the ones in the current study were found in a survey conducted in Recife-PE, in 2007, in

which were found 45 (52.9%) newborns with low birth weight, and 7 (8.2%) with normal weight⁽¹²⁾. In a similar survey in Fortaleza-CE, 91% of newborns were found with low birth weight, 57.9% with very low weight and 5.8% with extremely low birth weight. These data corroborate the results of the present study⁽¹⁾.

The birth weight and prematurity may be considered, in isolation, one of the main factors correlated with neonatal morbidity and mortality, thus constituting an indicator of the immediate health of the child to be born. It is considered that the low birth weight and prematurity are a problem difficult to control, because the prevention of this picture is a task that involves the population's quality of life^(13,14).

Prematurity and low birth weight represent a gateway to the impairments in neurobehavioral development of neonates⁽¹⁵⁾, because their systems are immature, especially the CNS, and have not yet been exposed to motor and sensory experiences (tactile, thermal, gustatory and other), hampering the interaction between the baby and the environment. Premature infants are more likely to present obstetrics traumas and low Apgar scores, compared with the newborn at term, in view of their greater muscle and bone weakness⁽¹⁶⁾.

Studies associate birth weight and gestational age with suspected neuropsychomotor development delay, confirming the relevance of these Variables, which may be used as a tool in the anticipated evaluation of neonatal morbidity, and in the consequent programming of specialized care related to neurological development of these children, such as early stimulation,^(3,4,15)

Regarding gender, it was observed a predominance of male newborns over females in the present investigation. Similar results were found in the literature^(1,16,17).

Female gender's protective factor is attributed to the faster maturation of the lung because lung maturity of newborn males is slower during fetal growth, resulting in a greater fragility⁽¹⁸⁾. However, another study suggests that male gender shows lower speed in the overall maturation compared to females due to the influences of Y chromosome⁽¹⁹⁾.

In this sense, a sharper look to the male gender is recommended, due to their fragility already gained in the conception, needing sensory-motor programs to prevent abnormal patterns in their development.

As for the Apgar score, in the current study increased values were evidenced in both the 1st and the 5th minutes, representing significant result with regard to the newborn's physiological recovery immediately after birth. Similar results were also found in a research conducted in a public hospital in Fortaleza-CE, which highlighted the distribution of newborns according to Apgar score, with a margin

of 53.72% of newborns with values greater than 7 in the 1st minute and 84.14% of newborns with above 7 at 5th minutes⁽¹⁾. Knowing that the Apgar score is an important indicator to detect the newborn's fragility soon after their first hours of life, its use becomes necessary, in order to identify children who need extra care, even in the absence of laboratory tests.

According to this study, the RDS was the most prevalent disease. Also known as hyaline membrane disease, respiratory distress brings great discomfort to the newborn. It is due to lung immaturity, which mostly affects premature infants within the first hours of life, and is characterized clinically by tachypnea, chest retraction and grunting⁽²⁰⁾.

A survey in a NICU of a hospital in Recife-PE found a prevalence of 98.8% of infants with RDS⁽¹²⁾. In another study⁽¹⁾, the incidence of RDS increased with decreasing birth weight and occurred in 54.3% of cases, emphasizing the data found in this study.

These results bring concerns because these newborns are more likely to require ventilatory support and the use of drugs, thereby increasing the length of stay in the NICU and possible impairments in psychomotor development, determining the need for early intervention as a way to prevent the advance of such neurological complications.

As for the intracranial hemorrhage, it had low incidence (n = 5, 4.3%) in the study group, since the data have found discrepancies with the findings of the literature, describing 44.68% of this complication among all preterm infants⁽²¹⁾. However, these results may indicate, with the progress of Neonatology, an improvement in the quality of care for more and more premature newborns, reducing this serious condition. The ICH is one of the main problems the premature faces at birth, directly attributed to the immaturity of the germinal matrix, and can cause serious injury at the neurological level, requiring, in such cases, the indication for early stimulation⁽²²⁾.

Intracranial hemorrhage has greater impact, the lower the GA and the weight are⁽²³⁾. In a study conducted in São Paulo, 87.5% of newborn infants with gestational age of less than 32 weeks were found presenting HIC. In relation to newborns' birth weight, they were divided into three categories: for weight between 1,500g and 2,500g, ICH occurred in 4.8%; between 1.001g and 1.500g, 27%; below 1,000g, in 100% of cases - data that is contrasting with the findings of the present study⁽²³⁾.

According to the ventilation modes used in newborns in our study, evidences of a growing increase in the use of CPAP associated with a reduction in the use of invasive MV were obtained. These data are highlighted by other research, which found 44.7% of newborns who used MV and 55.3% who did not undergo this ventilatory mode⁽²⁴⁾. In this sense,

CPAP has been shown to be a safe therapy, with basically topical complications, related to the length of time using the catheter and, as it does not constrain the infants' oral feeding, it causes them less damage⁽²⁵⁾.

However, it is suggested that any ventilatory mode used in newborns at risk is offered with caution, because they might represent great risk to neurodevelopment in this population, requiring the monitoring by a team of health professionals to reduce the possible damages⁽²⁴⁾.

Based on the neonatal variables and risk factors analyzed, this group of newborns had high probability of triggering deficits in their neuropsychomotor development, making it necessary that early stimulation is provided by a multidisciplinary team in the NICU, through specialized treatments that attenuate each newborn's peculiarities, according to their need.

CONCLUSION

The profile of the investigated newborns, subjected to early stimulation in a neonatal intensive care unit of reference, is represented by the male gender, premature, low birth weight and high Apgar score at 1st and 5th minutes, with a prevalence of respiratory distress syndrome and increase in the use of continuous positive airway pressure.

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