REVISTA ONLINE DE PESQUISA

CUIDADO É FUNDAMENTAL

Universidade Federal do Estado do Rio de Janeiro • Escola de Enfermagem Alfredo Pinto

RESEARCH

DOI: 10.9789/2175-5361.2019.v11i3.588-593

Primitive Reflexes of Neonates Born in a Maternity in the *Rio Grande do Sul* State

Reflexos Primitivos de Neonatos Nascidos em uma Maternidade no Sul do Brasil

Reflexiones de los Recién Nacidos Primitivos Nacidos en un Maternidad en el Estado de Rio Grande do Sul

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How to quote this article:
Centenaro O, Getelina CO, Cargnin MCS, *et al*. Primitive Reflexes of Neonates Born in a Maternity in the *Rio Grande do Sul* State. Rev Fund Care Online.2019. Apr./Jul.; 11(3):588-593. DOI: http://dx.doi.org/10.9789/2175-5361.2019.v11i3.588-593

ABSTRACT

Objective: Identifying what are the associations between the newborns' primitive reflexes with sex, color, height, cephalic perimeter, thoracic perimeter, Apgar index, gestational age, type of delivery, and intercurrences during labor. **Methods:** It is a documentary study with a quantitative approach. The medical records of both pregnant women and newborns were analyzed. The newborns considered in this study were born over the period from August to November 2014, in the maternity ward of a hospital in the Northern region of the *Rio Grande do Sul* State, Brazil. **Results:** 164 medical records were studied assessing whether there were presence or absence of primitive reflexes on the birth assessment sheet. The presence of primitive reflexes of the neonates presented significance in terms of height, head circumference, thoracic perimeter, and intercurrences in labor and gestational age. **Conclusion:** The presence of primitive reflexes in newborns has a direct relationship with gestation, delivery and postpartum, so the need to develop effective prenatal and delivery assistance actions is verified.

Descriptors: Neonate, Primitives, Nursing.

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RESUMO

Objetivo: Quais as associações entre os reflexos primitivos de neonatos nascidos com sexo, cor, estatura, perímetro cefálico, perímetro torácico, índice de apgar, idade gestacional, tipo de parto, intercorrências durante o trabalho de parto **Método:** estudo quantitativo do tipo documental. Foram analisados os prontuários de gestantes e neonatos que nasceram nos meses de agosto a novembro de 2014 na maternidade de um hospital do norte do estado do Rio Grande do Sul. **Resultados:** Foram estudados 164 prontuários avaliando se nestes constava presença ou ausência de reflexos primitivos descritos na ficha de avaliação do nascimento. A presença de reflexos primitivos do neonatos apresentou significância no que se refere a estatura perímetro cefálico perímetro torácico intercorrências no trabalho de parto e idade gestacional. **Conclusão:** a presença de reflexos primitivos em neonatos tem uma relação direta com a gestação, parto e pós-parto, assim verifica-se a necessidade de desenvolver ações efetivas de assistência ao pré-natal e parto.

Descritores: Neonato; Primitivos; Enfermagem.

RESUMEN

Objetivo: ¿Cuáles son las asociaciones entre los reflejos primitivos de los recién nacidos que nacen con sexo, color, talla, circunferencia de la cabeza, circunferencia de pecho, las puntuaciones de Apgar, edad gestacional, tipo de parto, complicaciones durante el método de parto y el parto: estudio el tipo de documento. Las historias clínicas de las mujeres embarazadas y los recién nacidos que nacieron en los meses de agosto a noviembre de 2014 en la sala de maternidad de un estado al norte del hospital de Rio Grande do se analizaron Sul **Resultados:**. Se estudiaron 164 registros evaluar si estos presencia consistido o ausencia de reflejos primitivos descritos el nacimiento de la forma de evaluación. La presencia de reflejos primitivos de los recién nacidos mostró importancia en relación con la altura del cabezal complicaciones circunferencia circunferencia en el trabajo y la edad gestacional. **Conclusión:** La presencia de reflejos primitivos en los recién nacidos tiene una relación directa con el embarazo, parto y post-parto, por lo que existe la necesidad de desarrollar medidas eficaces de asistencia a la atención prenatal y el parto.

Descriptores: Neonato, primitiva, enfermeira.

INTRODUCTION

Primitive reflexes are involuntary reactions in response to an external stimulus and consist of the first forms of human movement. They serve as the primary source of information, which is stored in the developing cortex.

"Primitive reflexes are called this way because they are controlled by the most primitive parts of the brain. By six months the child loses these reflexes and replaces them with more complex brain functions."[1] Among the primitive reflexes, the following stand out: "sucking, babinski, corneate, crawling, cross extension, doll eyes, defense (tonic neck), galant, seizure, moro, pupil, head rotation or search, fright, walk".[2] "The absence of these reflexes at ages when they should be present or, the persistence of those at the age when they should have disappeared, may indicate neurological impairment.[3]

In the first months of life, the presence, intensity, and symmetry of these reflexes can be used to assess the integrity of the central nervous system and to detect peripheral abnormalities, such as congenital musculoskeletal changes or nerve damage. On the other hand, the persistence of most of these reflexes in the second half of life also indicates developmental abnormalities.

The assessment of primitive reflexes in neonates is a major factor in the fight against neonatal mortality, since the absence of any of them may characterize abnormalities that may lead to the death of the child. "Nowadays, neonatal mortality is responsible for almost 70% of deaths in the first year of life, and proper care for the newborn has been one of the challenges to reducing infant mortality rates in our country."[4] Bearing this in mind, nurses play an important role in the evaluation of early reflexes in neonates, making possible an early diagnosis of abnormalities at the neurological level.

Given the aforementioned, the research problem is the following: What are the associations between the newborns' primitive reflexes with sex, color, height, cephalic perimeter, thoracic perimeter, Apgar index, gestational age, type of delivery, and intercurrences during labor?

The study's purpose was to identify either the presence or absence of early reflexes, and also factors associated with it, in children born in a maternity ward of a hospital in the Northern region of the *Rio Grande do Sul* State, Brazil.

METHODS

It is a documentary study with a quantitative approach. The medical records of both pregnant women and newborns were analyzed. The newborns considered in this study were born over the period from August to November 2014, in the maternity ward of a hospital in the Northern region of the *Rio Grande do Sul* State, Brazil.

Data were collected during the period from August to November 2014, in the maternity hospital by means of an instrument elaborated by the researchers in which the presence or absence of the primitive reflexes was identified, along with the records, as well as: the type of delivery, gestational age, Apgar index, length, cephalic perimeter, thoracic perimeter, the newborn urinated or evacuated in the delivery room and if necessary the referral to Intensive Care Unit.

The inclusion criteria were: the records of newborns between 0 and 28 days old, children born from August to November 2014 in the hospital. Exclusion criteria were children born before August and after November 2014.

The data were analyzed in the statistical program Statistical Package for Social Sciences (SPSS), version 21.0. Categorical variables were described by means of absolute and relative frequency and compared by Pearson's chi-square test. Aiming to complement this analysis, the adjusted residue test was applied. The level of significance was set at 5% ($p \leq 0.05$).

The ethical and legal principles according to the Resolution No. 466/2012 were respected and the project was approved by the Research Ethics Committee from the *Universidade Regional Integrada do Alto Uruguai e das Missões under the Certificado de Apresentação para Apreciação Ética (CAAE)* [Certificate of Presentation for Ethical Appreciation] No. 34609914.0.0000.5352.

RESULTS AND DISCUSSION

A total of 164 medical records of neonates born from August to November 2014 were analyzed. Male neonates 85 (51.8%), white 132 (80.5%), cesarean births 112 (68.7% %), Apgar index of 6 or more in the 1st minute 149 (92.5%). These and other data are described in **Table 1**.

Table 1 – Characteristics of neonates born in the maternity ward of a hospital in the Northern region of the Rio Grande do Sul State, Brazil, 2014.

Variable	Total sample*	n	%
Gender	164 (100%)		
Male		85	51.8
Female		79	48.2
Skin color	164 (100%)		
White		132	80.5
Black		2	1.2
Brown		2	1.2
Indian		28	17.1
Height	158 (96.3%)		
30 to 39 cm		1	0.6
40 to 49 cm		84	53.2
50 to 59 cm		73	46.2
Cephalic Perimeter	160 (97.6%)		
20 to 29 cm		5	3.1
30 to 35 cm		115	71.9
36 to 40 cm		40	25.0
Thoracic Perimeter	160 (97.6%)		
20 to 29 cm		13	8.1
30 to 35 cm		132	82.5
36 to 40 cm		15	9.4
Apgar Index	161 (98.2%)		
0 to 5 in the 1st minute		12	7.5
6 or more in the 1st minute		149	92.5
Evacuated	93 (56.7%)		
Yes		30	32.3
No		63	67.7
Urinated	99 (60.4%)		
Yes		30	30.3
No		69	69.7
Childbirth type	163 (99.4%)		
Cesarean		112	68.7
Normal		51	31.3
Intensive Care Unit	147 (89.6%)		
Yes		31	21.1
No		116	78.9
Gestational Age	164 (100%)		
20 to 25 weeks		2	1.2
26 to 30 weeks		5	3.0
31 to 37 weeks		44	26.8
38 to 42 weeks		113	68.9
Primitive Reflexes	163 (99.4%)		
Yes		132	81.0
No		31	19.0

*The total sample might vary due to missing data (whoever collected the data either forgot or it was not recorded in the medical record).

The present study found that neonates with primitive reflexes presented a higher proportion of height equal or superior to 50 cm, nonetheless, a study shows that "neonates in Brazil are born with 49 cm of height on average".[5]

The research shows that 132 (81%) of the newborns born from August to November 2014 presented primitive reflexes, whereas 31 (19%) did not show it.

Table 2 – Association between Variables of Interest and Neonates' Primitive Reflexes, 2014.

Variable	Primitive Reflexes		p
	Present (n=132) n (%)	Absent (n=31) n (%)	
Gender			0.594
Male	67 (50.8)	18 (58.1)	
Female	65 (49.2)	13 (41.9)	
Skin color			0.601
White	107 (81.1)	24 (77.4)	
Black	2 (1.5)	0 (0.0)	
Brown	1 (0.8)	1 (3.2)	
Indian	22 (16.7)	6 (19.4)	
Height			<0.001
30 to 39 cm	0 (0.0)	1 (3,4)*	
40 to 49 cm	59 (45.7)	25 (86,2)*	
50 to 59 cm	70 (54.3)*	3 (10,3)	
Cephalic Perimeter			<0.001
20 to 29 cm	1 (0.8)	4 (13.3)*	
30 to 35 cm	90 (69.2)	25 (83.3)	
36 to 40 cm	39 (30.0)*	1 (3.3)	
Thoracic Perimeter			<0.001
20 to 29 cm	2 (1.5)	11 (36.7)*	
30 to 35 cm	113 (86.9)*	19 (63.3)	
36 to 40 cm	15 (11.5)*	0 (0.0)	
Apgar Index			0.698
0 to 5 in the 1st minute	9 (6.9)	3 (10.0)	
6 or more in the 1st minute	122 (93.1)	27 (90.0)	
Childbirth type			0.079
Cesarean	86 (65.6)	26 (83.9)	
Normal	45 (34.4)	5 (16.1)	
Referral to the Intensive Care Unit			<0.001
Yes	2 (1.7)	28 (90.3)	
No	113 (98.3)	3 (9.7)	
Gestational Age			<0.001
20 to 25 weeks	2(1.5)	0(0.0)	
26 to 30 weeks	1 (0.8)	4 (12.9)*	
31 to 37 weeks	18 (13.6)	25 (80.6)*	
38 to 42 weeks	111 (84.1)*	2 (6.5)	

*Statistically significant association by the residuals test adjusted to 5% of significance.

The purpose of this study was to analyze the correlation between the previously described variables related to primitive reflexes. After the analysis of all the data it was possible to verify that there was a predominance of male neonates, according to data from the *Instituto Brasileiro de Geografia*

e Estatística (IBGE) [Brazilian Institute of Geography and Statistics], 2013 "the rate of children 0 to 4 years old male ratio in Brazil is equivalent to a percentage of 3.85% and the rate of female children is equivalent to 3.68% ";[6] so, we conclude that more men are born than women in Brazil.

> The greater mortality of the male population in relation to the female population can be observed from the moment of birth. The probability of a newborn male not completing the first year of life was 16.3 for every 1,000 live births. For females, this value was 13.7 per thousand, a difference of 2.6 deaths. Hence, infant mortality for boys is 1.2 times greater than for girls. Between 1 and 2 years old, this value increases to 1.3 times, remaining at this level up to 9 years. From this age, it grows until it reaches the maximum value between 22 and 23 years old: a man of 22 years is 4.6 times more likely to not reach the age of 23 than a woman, and then decreases according to age increases.[7]

Also related to life expectancy, for the male population in the year 2014 is "71.57 years, and 78.78 years for women. In the *Rio Grande do Sul* State, life expectancy for men is 73.74 years and for women it is 80.60";[6] in other words, women live longer than men.

Concerning the race, the data found are in line with data from the National Household Sample Survey (PNAD) published by the *IBGE*, reveals that in the criterion of declaration of color or race, most of the Brazilian population is " white, representing 45.5%. Already the group of people of brown color represents 45% of the total population of the country, another 8.6% declare of black color. In the South, 76% of the population is made up of white people."[7]

Regarding the height of the newborns, the study shows that the height of a full-term newborn varies between 45 and 53 cm. "The growth potential of a newborn can be interfered by several factors, including: birth weight, gestational age, neonatal intercurrences and maternal schooling".[8]

The cephalic perimeter of the neonates varied more in the range of 30 to 35 cm, in other words, about 115 (71.9%) had cephalic perimeter between these variables. "They corroborate these findings with the study in which it found that the cephalic perimeter appropriate for the age of the child varies between 30 to 36 cm".[9] "The cephalic perimeter is an important growth variable because it reflects brain growth and is significantly associated with cognitive and motor development in the first two years of the child's life."[10]

The growth of the cranial cavity occurs as a function of cerebral volume and cephalic perimeter measurements in the first 2-3 years of age accurately describe this growth.

> In the first trimester, it increases 2 cm/month, second trimester 1cm/month and in the second half 0.5 cm/month in case of variations of these values and the child present a leakage greater than 2 is suggestive of macrocephaly, 2 suggestive of microcephaly.[12]

In the case of the thoracic perimeter, the research shows that the children had the highest index between 30 and 35 cm. About 132 (82.5%) of the neonates prepared this measure. Studies have shown that the "thoracic perimeter in general measures about 2 cm less than the cephalic head, in an average of 30 to 33 cm."[2] "Measurement of the thoracic perimeter is intended to provide parameters for assessing the growth of the chest associated with possible malformations formations and pathologies".[13]

Most neonates did not urinate or evacuate in the delivery room. According to study 12, "the fact of urinating does not show the health of newborns since about 99% urinate in the first 48 hours of life and 23% do so in the delivery room." In the case of bowel movements, "90% of newborns have the elimination of meconium in the first 24 hours of life, if there is a delay in elimination, the most common causes are: intestinal obstruction, hypermagnesemia, Hirschsprung's disease".[12]

About 161 neonates had an Apgar index above 6 in the 5th minute after birth.

> The Apgar index also popularly recognized by parents as the "grade" that the baby receives soon after birth, in the fifth minute between 7 and 10 is considered normal. Apgar 4, 5 or 6 is considered intermediate and is related among others with prematurity, medicines used by the mother, congenital malformation, which does not mean an increased risk for neurological dysfunction. Indices from 0 to 3 in the fifth minute are related to a higher risk of mortality and a slight increase in risk for cerebral palsy.[14]

Regarding the childbirth type, it is in line with what research has already observed that rates of cesarean section have increased considerably in recent years, even with the prior knowledge that normal delivery is safer for both mother and baby.[15] Caesarean rates vary among regions, especially when related to the assistance provided by the *Sistema Único de Saúde (SUS*) [Unified Health System] with private assistance. The rate of cesarean sections in the supplementary health sector reaches close to 80%, while in the *SUS* it is close to 30%, well above that recommended by the World Health Organization (WHO).[16]

Caesarean section is indicated in cases of fetal distress, failure to progress to labor, poor fetal position, cephalopelvic disproportion.[16] The high incidence of "unnecessary cesarean sections is of global concern, as the benefits conferred on the fetus by cesarean section are small."[16] In addition to the procedure associated with" higher maternal mortality rates, approximately four to five times greater than vaginal delivery, it is also associated with increased perinatal morbidity and mortality."[16]

Considering the gestational age, births predominated between 38 and 42 weeks of gestation. "The newborn is

considered the term, birth at correct gestational age, in other words, between 37 to 41 weeks."[17]

Preterm birth is currently one of the leading causes of infant mortality in developed countries, with deaths due to other causes as a whole being the main cause of neonatal mortality. "75-80% of perinatal deaths occur in preterm infants".[18] It is also a risk factor for "neonatal morbidity and early childhood can contribute to long-term neurodevelopmental disorders, socio-emotional difficulties, and behavioral disorders, as well as affect health status in adult life."[18]

Neonates with primitive reflexes had a cephalic perimeter equal to or greater than 36 cm. "Monitoring the growth of the head circumference at regular intervals makes it possible to verify whether or not brain development is adequate, since there is a strong correlation between cephalic growth and brain development."[19]

Herein, there was significance between the presence of primitive reflexes with the thoracic perimeter of 30 cm or more. According to the study, "Thoracic mobility is related to the integrity of the respiratory muscles, which assists in the expansion and retraction of the thoracic cavity."[20] This measure is used to "assess parameters such as thoracic amplitude, lung volumes and capacities, lung compliance, thoracoabdominal mechanics, diaphragmatic function, muscle work and dyspnea."[20] "Chest mobility and lung function may change not only with the growth and appearance of respiratory diseases, but also with other factors such as body composition, sex, age, height, and ethnicity.[20]

The research demonstrated significance between the presence of primitive reflexes and the gestational age of 38 to 42 weeks. "Neonatal morbidity and mortality increase as gestational age decreases."[21]

> Preterm neonates have a global hypotonic event, because of the lower the gestational age, the greater the range of motion that the baby's body segments will reach, being these in extension and abduction, being unable to overcome the effects of gravity. This is justified by the time spent inside the womb, not experiencing a restricted space of space that would cause him to develop an increased tone. A full-term child has a physiological hypertonia, keeps its limbs flexed, has a resistance to passive extension and there is voluntary spontaneous movement.[22]

Intercurrences in labor that culminated in the referral of the neonates to the Intensive Care Unit (ICU) showed a correlation with the absence of primitive reflexes. In a study, it was demonstrated that the "absence of primitive reflexes has a direct relation with the precocious gestational age, meconium-stained amniotic fluid, resuscitation maneuvers and in many cases, referral to the ICU".[10]

CONCLUSIONS

This work came to contribute to the qualification, commitment, attention and application of the primitive reflexes, not only by the medical professionals but also by us nurses who have the right knowledge of this subject.

In this study, the characteristics of the neonate were analyzed, where the sample was composed of 164 newborns. There was predominance of white color (80.5%), cesarean section (68.7%), Apgar index of 6 or more in the 1st minute (92.5%) and male prevalence (51.8%), according to **Table 1** described above, and after evaluation of the association of the primitive reflexes with the variables studied in **Table 2**.

When analyzing the association between the primitive reflexes and the study variables, there was a significant association with height, cephalic perimeter, thoracic perimeter, intercurrences in labor and gestational age. Neonates with primitive reflexes presented a higher proportion of height equal or superior to 50 cm, cephalic perimeter equal to or greater than 36 cm, thoracic perimeter with 30 cm or more, without intercurrences in labor and gestational age between 38 and 42 weeks.

The seriousness and commitment that we present regarding maternal health and the health of the child are verified. In the case of maternal health, it is important to emphasize the importance of accompanying and orienting about healthy eating, physical exercise, clarification about childbirth, as well as the accomplishment of prenatal consultations for the exact verification of the gestational age and also a monitoring of the development of the fetus.

Conclusively, the nurse has a primordial role in the realization of the reflexes, since it has knowledge for the accomplishment of the same, thus obtaining a compromise as to the effectiveness of the reflection, being able to intermediate and assist this newborn in an early diagnosis if the same do not present the reflexes.

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Received on: 06/23/2017
Required Reviews: 09/11/2017
Approved on: 11/03/2017
Published on: 04/02/2017

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The authors claim to have no conflict of interest.