DOI 10.18471/rbe.v31i4.20458 Original Article

PREDICTING FACTORS FOR ADMISSION OF NEWBORNS IN NEONATAL INTENSIVE CARE UNITS

FATORES PREDITORES PARA A ADMISSÃO DO RECÉM-NASCIDO NA UNIDADE DE TERAPIA INTENSIVA NEONATAL

FACTORES PREDICTORES PARA LA ADMISIÓN DEL RECIÉN-NACIDO EN LA UNIDAD DE TERAPIA INTENSIVA NEONATAL

Lediana Dalla Costa[1]
Vanuza Fatima Andersen[2]
Alessandro Rodrigues Perondi[3]
Vivian Francielle França[4]
Jolana Cristina Cavalheiri[5]
Durcelina Schiavoni Bortoloti[6]

How to cite this article: Costa LD, Andersen VF, Perondi AR, França VF, Cavalheiri JC, Bortoloti DS. Predicting factors for admission of newborns in neonatal intensive care units. Rev baiana enferm. 2017;31(4):e20458.

Objective: determine the association between predicting factors for newborn admission in Neonatal Intensive Care Units and maternal characteristics. Method: analytical, documental, retrospective, quantitative study followed by field research, which evaluated 119 medical records in period of May and August 2016. Results: observed in mothers between the ages of 20 and 25 years (31.1%); had elementary education (42.0%); 49.6% were married and 80.7% had a caesarean section. Pre-natal exams were conducted in 95.0% of pregnant women and 97.5% showed gestational pathologies. Among the newborns, 51.3% were female; 88.2% were discharged to remain with their mothers at the hospital, 71.4% were hospitalized for premature birth, 40.3% for respiratory problems and 28.6% for hipoglycemia. Conclusion: the hospitalization of newborns in Neonatal Intensive Care Units is consequently related to maternal characteristics and pathologies developed in the gestational period.

Descriptors: Neonatal care. Newborn. Neonatal Intensive Care Units. Neonatal nursing.

Objetivo: determinar a associação entre os fatores preditores para a admissão do recém-nascido em Unidade de Terapia Intensiva Neonatal e as características maternas. Método: estudo analítico, documental, retrospectivo, quantitativo, seguido de pesquisa de campo, que avaliou 119 prontuários, no período de maio a agosto de 2016. Resultados: observaram-se mães com idade entre 20 e 25 anos (31,1%); nível fundamental (42,0%); 49,6% eram casadas e 80,7% tiveram parto cesárea. O pré-natal foi realizado por 95,0% das gestantes e 97,5% apresentaram patologias gestacionais. Dos neonatos, 51,3% eram do sexo feminino; 88,2% receberam alta para o alojamento conjunto com a mãe, 71,4% internaram por prematuridade, 40,3% por problemas respiratórios e 28,6% por hipoglicemia. Conclusão: a internação do recém-nascido na Unidade de Terapia Intensiva Neonatal está consequentemente relacionada às características maternas e às patologias desenvolvidas no período gravídico.

Descritores: Cuidado pré-natal. Recém-nascido. Unidades de Terapia Intensiva Neonatal. Enfermagem neonatal.

[1] Master in Labor Health and Management. Professor at the Nursing school of Universidade Paranaense. Campus of Francisco Beltrão, Paraná, Brazil. lediana@unipar.br
[2] Acadêmica do curso de Enfermagem da Universidade Paranaense. Unit of Francisco Beltrão, Paraná, Brasil.
[3] Master in Labor Health and Management. Professor at the Nursing school of Universidade Paranaense. Campus of Francisco Beltrão, Paraná, Brazil.
[4] PhD in Nutrition. Professor at the Nutrition school of Universidade Paranaense. Campus of Francisco Beltrão, Paraná, Brazil.
[5] Specialist in Medical and Surgical Clinic Management. Professor at the Nursing school of Universidade Paranaense. Campus of Francisco Beltrão, Paraná, Brazil.
[6] PhD in Health Sciences. Professor at the Physical Education school of Universidade Paranaense. Campus of Francisco Beltrão, Paraná, Brazil.

Objetivo: determinar la asociación entre los factores predictores para la admisión del recién-nacido en la Unidad de Terapia Intensiva Neonatal y las características maternas. Método: estudio analítico, documental, retrospectivo, cuantitativo, seguido de investigación de campo, que evaluó 119 historias clínicas, en el periodo de mayo a agosto de 2016. Resultados: fueron observadas madres con edad entre 20 y 25 años (31,1%); escolaridad básica (42,0%); 49,6% eran casadas y 80,7% tuvieron parto por cesárea. El prenatal fue realizado por 95,0% de las gestantes y 97,5% presentaron patologías gestacionales. De los neonatos, 51,3% eran del sexo femenino; 88,2% recibieron alta junto con la madre, 71,4% fueron internados por prematuridad, 40,3% por problemas respiratorios y 28,6% por hipoglicemia. Conclusión: la internación del recién-nacido en la Unidad de Terapia Intensiva Neonatal está consecuentemente relacionada con las características maternas y las patologías desarrolladas en el periodo gestacional.

Descriptores: Cuidado Prenatal. Recién-Nacido. Unidades de Terapia Intensiva Neonatal. Enfermería Neonatal.

Introduction

Neonatal Intensive Care Units (NICU) are characterized as a place specialized in the treatment of newborns (NB) whose lives are at risk within health institutions. With capable professional teams and advanced technical equipment, NICUs make possible greater survival of premature newborns and/or newborns with associated pathologies, promoting their physiological well-being[1].

Neonatal assistance starts with family planning, basic attention, when the couple is preparing for a future pregnancy. The performance of quality and humanized prenatal care, with at least six consultations during the gestational period and the easy access to health services enable the pregnancy to occur in a healthy manner, as quality assistance during the gestational period facilitates the detection of irregularities which may prolong or anticipate the birth of newborns[2].

Prenatal follow-up is essential to guarantee a healthy pregnancy and a safe delivery, besides providing the means to clarify questions future mothers may have. Aiming at improving access, coverage and quality of this service, the Ministry of Health launched in 2000 the Neonatal Humanization and Delivery Program (NHDP)[3]. This program stimulates pregnant women to reach out to the Unified Health System (SUS) and establishes that at least six consultations should be performed: one in the first trimester of the pregnancy, two in the second and three in the third.

The Neonatal period comprises from zero to 28 days of life of the NB and is characterized as the period of greater vulnerability, with occurrences of several anatomical, physiological and family adaptations. However, when a NB shows life threatening clinical conditions, such as: prematurity, malformations of the cardiovascular, gastrointestinal, neurological systems and respiratory pathologies, among others, the NB is hospitalized in NICUs[4].

Some risk factors may be related with neonatal hospitalization: the weight, the prematurity, the Apgar (1st, 5th and 10th minutes) and socioeconomic conditions[5]. Maternal characteristics also influence directly the hospitalization of NBs in NICUs, such as: race, age, multiple gestation, interval between deliveries, history of premature delivery, stillborn, miscarriage, type of delivery, besides other diseases such as hypertension, diabetes, urinary infection, anemia, malnutrition, obesity, the use of drugs, alcohol and tobacco[5].

A study carried out in Brazil in 2015 describes that the main characteristics of newborns admitted in NICUs were: mostly males (53.1%), premature (92.1%), low birth weight (80.5%), with Apgar indices greater than seven in the 1st and 5th minutes of life (63.2% and 86.1%, respectively) and not have been ministered therapy with exogenous pulmonary surfactant at birth (54.7%)[6].

We add that in southwest region of Parana state, there is scarcity of epidemiologic studies about the factors that influence in the hospilatization of NBs in NICUs. Consequently, it is believed that the results of this study will be able to contribute in the future for the implementation of public policy, as well as training of multidisciplinary teams with the collected data.

Therefore, this research has the goal of determining the association between the predicting factors for admission of newborns in NICUs and maternal characteristics.

Method

Analytical, documental and retrospective study followed by field research through a quantitative method, which was developed at Regional Hospital of Southwestern Paraná, Brazil, a reference unit in neonatal services and high risk and intermediate risk pregnancy. The study sample was comprised of 119 records from the maternity and from the NICU, from mothers who delivered at that institution in 2015. We opted for this year for presenting the highest number of hospitalization since its opening and better consolidation of services in the region.

Inclusion and exclusion criteria were used to limit the sample. The inclusion criteria were all the maternity records whose deliveries took place at the institution and whose NBs were hospitalized at the NICU. The exclusion criteria used in the study were other records whose deliveries did not take place at the maternity under study and all the NBs admitted from other institutions.

A form developed by the authors based on studies on the subject was used for data gathering. Later, data that listed variables of the sociodemographic profile and maternal characteristics (age, origin, zone, education, marital status, prenatal follow-up and number of consultations, type of delivery and gestational pathologies) were collected.

In the NB records, the following characteristics were collected: sex, gestational age, birth weigth, Apgar in the 1st and 5th minutes of life, initial entry diagnostic at the NICU and clinical evolution.

The records were analyzed anonimously, random numbering was assigned to them to preserve the privacy of the identity of the NBs and their respective mothers. Data gathering took place between the months of May and August 2016, at the Medical Records and Statistic Services of the hospital, which provided the records.

After data gathering, the information was compiled to the software Microsoft Excel 2010 and to the software of statistical analysis *Statistical Package for Social Science* (SPSS). Descriptive statistics was used for sample characterization and frequency distribution of the different analyzed variables. Furthermore, we carried out the Chi-squared test to assess the association between the nenoate and the gestational age, weight at birth and Apgar in the 1st minute. Additionally, we used the Spearman correlation test between the number of appointments and maternal age, and the gestational age, weight at birth and Apgar in the 1st and 5th minutes. The adopted level of significance was $p < 0.05$. All data were presented in tabular form.

The study was forwarded to the Ethical Committee for Research on Human Beings according to Resolution no. 466/2012 of the National Health Council which issue a favorable statement as per Protocol no. 1.526.543.

Results

The number of NBs admitted to the NICU during 2015 was 167; from those, 119 records were selected for research for meeting the inclusion criteria of the study.

Regarding the variable of sociodemographic profile and maternal characteristics of the NBs admitted to the NICU, it was noted that 31.1% were between 20 and 25 years of age, 28.6% were between 41 and 45 years of age. Regarding origin, 26.9% resided in the municipality where the research was being carried out, followed by other municipalites in the region.

Regarding the Health Region, 96.7% belonged to the Eighth Regional, which includes 27 municipalities of the southwestern Parana; in addition, 79.8% resided in an urban region.

Regarding maternal education, it was noted that 42.0% had elementary education. Regarding marital status, 49.6% were married. From those women, 80.7% transitioned to caesarean section (Table 1).

Table 1 – Variables of sociodemographic profile and characteristics of mothers whose NBs were admitted to the NICU. PR, Brazil – 2016 (n = 119)

Variable	n	(%)
Age brackets (years)		
13 to 19	18	15.1
20 to 25	37	31.1
26 to 30	30	25.2
41 to 45	34	28.6
Education		
Illiterate	3	2.6
Elementary	50	42.0
High School	49	41.2
College	15	12.6
Technical	1	0.8
Graduate	1	0.8
Marital Status		
Married	59	49.7
Separated	3	2.5
Single	23	19.3
Consensual Union	33	27.7
Registry Absence	1	0.8
Health Regional		
Eighth Health Regional	115	96.7
Seventh Health Regional	3	2.5
Tenth Health Regional	1	0.8
Origin		
Francisco Beltrão	32	26.9
Santo Antônio do Sudoeste	10	8.3
Dois Vizinhos	7	5.8
Realeza	6	5.0
Marmeleiro	6	5.0
Other municipalities	58	49.0
Zone		
Rural	24	20.2
Urban	95	79.8
Type of Delivery		
Caesarean	96	80.7
Vaginal	23	19.3
Diagnostics		
One diagnostic	30	25.2
Two diagnostics	56	47.1
Three diagnostics	29	24.4
Four diagnostics	3	2.5
Five or more diagnostics	1	0.8

Source: Developed by the Authors.

Table 2 – Variables regarding having prenatal consultation, presence of gestational pathologies and diagnostics. PR, Brazil (n =119)

Variable	YES n (%)	NO n (%)
Had prenatal consultation	113 (95.0)	6 (5.0)
Presence of gestational pathology	116 (97.5)	3 (2.5)
Intrauterine growth restriction	31 (26.1)	88 (73.9)
Premature amninorrhexis	17 (14.3)	102 (85.7)
Maternal syphilis	15 (12.6)	103 (86.6)
Amniotic fluid pathologies	14 (11.8)	105 (88.2)
Urinary tract infection	11 (9.2)	108 (90.8)
Gestational diabetes	8 (6.7)	111 (93.3)
Premature placental abruption	7 (5.9)	112 (94.1)
Previous caesarean sections	6 (5.0)	113 (95.0)
Hemodynamic fetal centralization	6 (5.0)	113 (95.0)
Chorioamnionitis	4 (3.4)	115 (96.6)
Istmo cervical incompetence	4 (3.4)	115 (96.6)
Anemia	3 (2.5)	116 (97.5)
Hydronephrosis	2 (1.7)	117 (98.3)
Outros	11 (9.2)	108 (90.8)

Source: Developed by the Authors.

Maternal data regarding the gestational period showed that 95.0% of mothers had prenatal consultations and 97.5% developed some kind of pathology during pregnancy. Among gestational pathologies, premature delivery (PD) accounted for 47.1% followed by gestational specific hypertensive disease (GSHD) (Table 2).

Among the variables related to NBs, it was noted more admission of females at 51.3%. Regarding gestational age, 79.8% were pre-term; on weight, 73.1% weighed under 2.5 kg. Regarding newborn evolution, 89.9% were discharged from intensive care to remain with the mother at the hospital and 7.6% died (Table 3).

Table 3 – Characteristics of New Borns admitted to the NICU. PR, Brazil – 2016 (n = 119)

Variables	n	(%)
Sex		
Female	61	51.3
Male	58	48.7
Gestational age		
Pre-term	95	79.8
At term	24	20.2
Birth weight		
< 2,500 g	87	73.1
≥ 2,500 g	32	26.9
Diagnostics		
One diagnostic	27	22.7
Two diagnostics	42	35.3
Three diagnostics	40	33.6
Four diagnostics	8	6.7
Five or more diagnostics	2	1.7
Evolution		
Discharged to remain with mother at the hospital	107	89.9
Death	9	7.6
Transferred to another hospital	3	2.5

Source: Developed by the Authors.

Regarding the initial admission diagnostic at the NICU, hospitalization for prematurity at 71.4% and respiratory problems at 46.1% predominated.

Table 4 – Diagnostics of hospitalization of newborns at the NICU. PR, Brazil – 2016 (n = 119)

Diagnostic	Yes n (%)	No n (%)
Prematurity	85 (71.4)	34 (28.6)
Respiratory problems	59 (46.1)	60 (53.9)
Hypoglicemia	34 (28.6)	85 (71.4)
Congenital malformation	23 (19.3)	96 (80.7)
Infections	14 (11.8)	105 (88.2)
Hyaline membrane disease	13 (10.9)	106 (89.1)
Changes in the heart beat	10 (8.4)	109 (91.6)
Precocious sepsis	8 (6.7)	111(93.3)
Intrauterine growth restrictions	4 (3.4)	115 (96.6)
Potentially infected	4 (3.4)	115 (96.6)
Convulsion	2 (1.7)	117 (98.3)
Coagulatory disorder	2 (1.7)	117 (98.3)
Meconium aspiration	2 (1.7)	117 (98.3)
Others	6 (5.0)	113 (95.0)

Source: Developed by the Authors.

Regarding the measurement of tendencies, Table 5 shows the proportion of variability of the variables maternal age, number of prenatal consultations, gestational age (GA), birth weight and Apgar on the 1st and 5th minutes.

Regarding the association to the evolution of the NB with GA, birth weight and Apgar in the 1st minute, the $\chi 2$ test did not show a statistically significant association (Table 6).

In the search of correlations with the variable number of consultations, no positive and *Spearman* coefficient dependent relations were found. Thus, the older the mother, the greater the number of consultations. Regarding the correlation of the variable maternal age, there was also no significant relation (Table 7).

Discussion

Several conditions, habitually known, may result in death risks during the neonatal period, such as prematurity, low birth weight and severe asphyxiation. These NBs need more specialized assistance and may present greater possibility of admission to NICUs. Some factors related to the mothers also contribute directly or indirectly to hospitalization, such as, for example, high number of deliveries, mother's low education, low family income and advanced maternal age[1].

The results obtained in this study reaffirm that sociodemographic factors are related to the hospitalization of NBs at the NICU. As such, it was observed that most mothers of these newborns were between 20 and 25 years of age, with the average of 26.5 years, an age considered ideal for reproduction. However, the age bracket of 41 to 45 years of age also presented itself as a significant number in the research, corresponding to 28.6%[1].

Data similar to these were described in study which ascertained that the majority of newborn mothers were between 19 and 25 years old, with the average age of 24.4 years old[2]. The best maternal age from a reproduction stand point is between 20 and 25 years old, called young adult, a period considered as that of the lowest perinatal risk[7]. However, the extremes of maternal age presented a significant frequency for the

Table 5 – Measurements of central tendencies and variability of the variables maternal age, number of prenatal consultations, gestational age, birth weight and Apgar on the 1st and 5th minutes. PR, Brazil – 2016 (n = 119)

Variable	Average	CI	SD	Min.	Max.
Maternal age	26.57	25.32–27.82	6.88	14.00	42.00
Number of prenatal consultations	7.05	6.41–7.70	3.56	0	15.00
Gestational age	33.66	33.06–34.26	3.29	25.00	41.00
Birth weight	2.038.54	1.898.71–2.178.37	770.26	726.00	4.050.00
Apgar 1st minute	6.80	6.39–7.22	2.28	0	10.0

CI: Confidence Interval; SD: Standard Deviation; Min: Minimum; Max.: Maximum

Source: Developed by the Authors.

Table 6 – Association between NB evolution and the variables gestational age, birth weight and Apgar in the 1st minute. PR, Brasil – 2016 (n = 119)

	NB Evolution			
Variables	**High (n) %**	**Death n (%)**	**Total n (%)**	**X²**
Gestational age				0.481
Pre-term	87 (91.6)	8 (8.4)	95 (100)	
At term	23 (95.8)	1 (4.2)	24 (100)	
Birth weight				0.743
< 2.5 kg	80 (92.0)	7 (8.0)	87 (100)	
≥ 2.5 kg	30 (93.8)	2 (6.3)	32 (100)	
Apgar 1st minute				0.114
0 a 6	77 (95.1)	4 (4.9)	81 (100)	
7 a 10	33 (86.8)	5 (13.2)	38 (100)	

Source: Developed by the Authors.

Table 7 – Correlations between the number of prenatal consultations and maternal age with the variables gestational age, birth weight and Apgar in the 1st and 5th minutes. PR, Brazil – 2016 (n = 119)

Variables	Spearman p	P value	Spearman p	P value
GA	0.277	0.002	-0.065	0.486
Birth weight	0.160	0.083	-0.055	0.552
Apgar 1st minute	0.124	0.181	-0.090	0.332
Apgar 5th minute	0.040	0.671	-0.062	0.502

Source: Developed by the Authors.

needs of NICU, constituting the greatest gestational risk factors and worse perinatal conditions, such as premature delivery, low birth weight and requiring the greatest need of hospitalization of the newborn at the NICU[8].

Low maternal education is another factor which may affect the assistance to pregnant, as it is considered by the Ministry of Health as an obstetric risk factor[9]. Low maternal education is also presented as a danger to the mother and to the NB, as it influences directly in the performance of prenatal consultations, perinatal and neonatal follow-up, thereby increasing mortality at this age bracket among those in unfavorable socioeconomic conditions[2].

Another sociodemographic aspect that has been observed is that the majority of pregnant women live with their partners, which constitutes a positive aspect that was described in another study[1], as living with the child's father may psychologically influence those women by providing emotional, financial and psychosocial safety to them.

Regarding origin, a significant number of 26.9% of women resided in the municipality

where this research was carried out, which may be explained by the location of the maternity under study and the municipality has the greatest number of inhabitants compared to the others. However, the majority of the mothers were from the urban zone and belonged to the Eighth Health Regional, which includes 27 municipalities, including the municipality where the hospital of this study is located, as a reference in high and intermediate risk pregnancy.

The results of the study show a predominance in caesarean section deliveries at 80.7% in high risk pregnancies with diseases and several complications. This data are close to those of a similar study which delineated the epidemiological profile of pregnant women of high risk in the municipality of Francisco Beltrão, served by *Instituto da Mulher*, in the months of January to June 2015, which presented a predominance of caesarean section deliveries of 80.3%[10].

This factor may be explained by the change in birth patterns in Brazil, in which caesarean sections became the most common type of delivery, accounting for 85% of deliveries at private health service providers. At the public health system, the rate is considerably lower, at 40%, although still high when considered the recommendation of the World Health Organization at 15%[9].

One must evidence that, when caesarean sections are carried out under specific medical indications, the surgery becomes essential to the health of the mother and the child. However, it may increase the risk of serious complications when performed without the correct indication[9].

From a neonatal standpoint, and mainly because of the performance of unnecessary caesarean sections on women with real gestational age around the 37th week, the procedure becomes an important contributor to the occurrence of neonatal respiratory discomfort and hospitalization in neonatal intensive care units[9].

Another analyzed factor was attendance to prenatal consultations. The study demonstrates a high adhesion rate to prenatal consultations, in which 95.0% of pregnant women attended and only 5.0% did not. In a study entitled Maternal risks associated to the need of neonatal intensive care unit, with 236 pregnant women, the data are similar, insofar as 6.3% of pregnant women did not attend the consulations and 93.7% did[7]. A proper prenatal care consultation must take place as early as possible, having universal access to a minimum number of periodic consultations and executing preventive and educational actions on pregnancy health[11].

The present study may be compared to a research carried out in the municipality of Belém, in Pará state, which ascertained that the majority of women attended prenatal consultations, 89.9%, data which demonstrate an ideal coverage of prenatal assistance for a population under obstetric risk[12].

Regarding pathologies during pregnancy, the ones that stand out are PD (47.1%), GSHD (26.9%) and Intrauterine growth restriction (IGR) (26.1%). Those complications are associated with unfavorable gestational outcomes such as prematurity, low birth weight, premature rupture of membranes and puerperal infection[2]. An equivalent study which delineated the profile of prevalent high risk gestational pathologies at a maternity school in the municipality of Maceió, in Alagoas state, affirms that PD was also the most prevalent pathology at 31.4%[13]. However, systemic arterial hypertension (SAH) is the disease that most frequently poses complications to pregnancies, at the rate of 5% to 10% of pregnancies, and is among the main causes of maternal and perinatal deaths[14].

Thus, GSHD presents potentially the worst maternal-fetal prognostics; as such, fetuses of hypertense mothers have higher risks of prematurity, occurrences of deliveries of fetuses that are small for their gestational age, need of NICU, need of ventilatory support and higher incidence of perinatal mortality[12]. Likewise, IGR, which is defined when the fetus does not reach the genetically determined size for its gestational age, affects about 15% of pregnancies and is associated with mortality and perinatal, child and adult morbimortality[15].

Regarding the NBs who were admitted to the NICU, it was observed that the majority was

female (51.3%), data which corroborate with a study that showed 53.8% of hospitalizations by females[16]. Several studies indicate males as having higher prevalence in hospitalizations, which contradict the current research[2,5,6,17].

Regarding the gestational age variable, the majority of newborns were born pre-term (79.8%). Data may be compared to the ones found in a research which realized the association between the attendance of prenatal consultations and neonatal morbidity, carried out in Santa Maria, Rio Grande do Sul state, which obtained 65.0% of hospitalizations of pre-term newborns[5]. One may affirm that the cause of pre-term birth is multifactorial and complex, subject to social factors such as: low income and low maternal education; psychological, such as depression and anxiety; behavioral, such as smoking; socioeconomic and cultural, including maternal age at the extremes of the period and related to prenatal assistance and biological, such as conceiving twins and malformation[18].

In the current research, one may observe that inadequate birth weight presented itself as very relevant (73.1%). In this sense, a research carried out in a public maternity in Piauí[2] state obtained similar data, in which 83.0% of NBs had birth weights that were lower than 2.5 kg. One may conclude that this tends to be a predisposition factor for serious health problems, as NBs whose birth weight was lower than 2.5 kg present biological disadvantages which involve respiratory, metabolic and immune changes of serious repercussions in the immediate post-delivery, and which may be detrimental to postnatal growth and development[2].

Regarding the evolution of NBs, it was noted that the majority of patients was discharged to remain with the mother at the hospital (89.9%). An insignificant number died. Such high rate is related to technical advancements at the NICU and professional training of team members, along with continuing education. In this regard, a research carried out at the NICU at University Hospital Clemente de Faria (HUCF), of Montes Claros State University (Unimontes), during the period of January 2007 to June 2012, demonstrated that 76.1% of newborns were discharged from the hospital[16] and, in a study carried out by *Santa Casa de Misericórdia do Pará* Foundation (FSCMP), in northern Brazil, it was observed a discharge rate from the NICU of 62.2%[6].

Among the predicting pathologies for hospitalization of NBs at the NICU, the following stand out in the research: prematurity (71.4%), respiratory problems (46.1%), followed by hypoglicemia (28.6%), and congenital malformations (19.3%). A similar study developed in the north of Brazil in 2013 indicated a hospitalization rate of 77.0% for prematurity, 74.8% for respiratory affections and 11.9% for congenital malformations[6]. Another study developed in Santa Maria portrayed prematurity and respiratory problems, both at 57.0%, as the main reasons for NB admissions to NICU[20]. Another research carried out in a public maternity in the state of Piauí exposed respiratory problems (57.2%) and prematurity (35.0%) as reasons for admission to the NICU[2].

Therefore, premature births poses as a great challenge to public health services in all over the world, as it is a determinant of neonatal morbimortality. Prematurity currently is the main cause of neonatal mortality at 75%[21].

A study developed in Maceió shows that respiratory discomfort syndrome (SDS) ranks high in neonatal mortality indices. Among 60% of newborns with gestational age under 30 weeks will develop this pathology, as will approximately 5% of those with more than 37 weeks[22].

This study provided relevant results related to the main causes of NB admission to the NICU, as it is an area of scarce studies on this subject. Therefore, even with study limitations, lack of documentation and record data, for example, the copy of the pregnant woman's identification card and the copy of the declaration of live birth, this research was important so that health professionals understand the main risk factors of prematurity that affect this population.

Conclusion

This study was able to ascertain that NB hospitalization in the NICU is consequently related

to maternal characteristics and the pathologies developed in the gestational period. It is noted that prevention in the birth of those children must be among the priorities in prenatal assistance, as proper prenatal care aims at identifying in advance any changes in the gestational development and possible complications.

The objectives proposed by the research were reached, as, through the study, one may identify the factors that contributed to NB hospitalization in the NICU, as well as point out the elements of the obstetric history related to newborn hospitalization and its characteristics, the predicting factors for NB admission to the NICU and the prematurity rate of the unit in this study.

Therefore, new studies in other regions in Brazil, with more significant samples are necessary to broaden the discussion and further bring new clarifications on this subject.

Collaborators

1. design, project, analiysis and interpretation of data: Lediana Dalla Costa e Vanuza Fatima Andersen.

2. writing of the article, relevant critical review of its intellectual content Alessandro Rodrigues Perondi, Vivian Francielle França, Jolana Cristina Cavalheiri e Durcelina Schiavoni Bortolotti.

3. final approval of the version to be published: Lediana Dalla Costa e Vanuza Fatima Andersen.

References

1. Ribeiro CDS, Sousa JCO, Cunha KJB, Santos TMG, Moura MEB. Caracterização sociodemográfica das mães dos recém-nascidos admitidos na UTI de uma maternidade pública de Teresina-PI. Rev Interdisciplinar NOVAFAPI. 2011 abr-mai-jun;4(2):46-50.

2. Lages CDR, Sousa JCO, Cunha KJB, Silva NC, Santos TMMG. Fatores preditores para a admissão do recém-nascido na unidade de terapia intensiva. Rev Rene. 2014 jan-fev;15(1):3-11.

3. Ministério da Saúde (BR). Brasil incentiva ações e campanhas para garantir pré-natal a gestantes. Brasília, DF: Ministério da Saúde; 2014 [citado 19 set 2016]. Disponível em: http://www.brasil.gov.br/saude/2011/10/brasil-incentiva-acoes-e-campanhas-para garantir-pre-natal-a-gestantes.

4. Nietsche EA, Nora AD, Neves ET, Lima MGR, Bottega JC, Sosmayer VL. Educação em saúde: planejamento e execução da alta em uma unidade de terapia intensiva neonatal. Esc Anna Nery. 2012 out-dez;16(4):809-16.

5. Basso CG, Neves ET, Silveira A. Associação entre realização de pré-natal e morbimortalidade neonatal. Texto Contexto Enferm. 2012 abr-jun;21(2):269-76.

6. Lima SS, Silva SM, Avila PES, Nicolau MV, Neves PFM. Aspectos clínicos de recém-nascidos admitidos em Unidade de Terapia Intensiva de hospital de referência da Região Norte do Brasil. ABCS Health Sci. 2015;40(2):62-8.

7. Costa AL, Araujo Júnior E, Lima JW, Costa FS. Fatores de risco materno associados à necessidade de unidade de terapia intensiva neonatal. Ver Brás Ginecol Obstet. 2014;36(1):29-34.

8. Ministério da Saúde (BR), Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Gestação de alto risco: manual técnico. 5a ed. Brasília, DF: Ministério da Saúde; 2012.

9. Ministério da Saúde (BR), Secretaria de Ciência, Tecnologia e Insumos Estratégicos Comissão Nacional de Incorporação de Tecnologia do SUS. Diretrizes de Atenção à Gestante: a Operação Cesariana. Brasília, DF: Ministério da Saúde; 2015.

10. Costa LD, Cura CC, Perondi AR, França VF, Bortoloti DS. Perfil epidemiológico de gestantes de alto risco. Cogitare Enferm. 2016 abr-jun;21(2):1-8.

11. Uchimura LYT, Uchimura NS, Santana RG, Felchner PCZ, Uchimura TT. Adequabilidade da assistência ao pré-natal em duas unidades de saúde em Curitiba, Paraná. Cienc Cuid Saúde. 2014 abr-jun;13(2):219-27.

12. Dias RMM, Santos SN. Perfil epidemiológico das mulheres com síndromes hipertensivas na gestação e sua repercussão na prematuridade neonatal em uma maternidade pública de Belém/PA. Enfer Brasil. 2016;15(1):5-11.

13. Santos DTA, Campos CSM, Duarte ML. Perfil das patologias prevalentes na gestação de alto risco em uma maternidade escola de Maceió, Alagoas, Brasil. Ver Brás Med Fam Comunidade. 2014 jan-mar;9(30):13-22.

14. Guerreiro DM, Borges WD, Nunes HHM, Silva SC, Maciel JP. Mortalidade materna relacionada à doença hipertensiva especifica da gestação (DHEG) em uma maternidade no Pará. Ver Enferm UFSM. 2014 out/dez;4(4):825-34.

15. Robalo R, Ribeiro F, Pedroso C, Figueiredo A, Martins I, Martins AT. Restrição do crescimento fetal: casuística de 4 anos. Acta Obstet Ginecol Port. 2013;7(2):78-82.

16. Carneiro JA, Costa FM, Viera MM, Reis TC, Carneiro MA, Caldeira AP. Características de recém-nascidos de muito baixo peso admitidos em unidade de terapia intensiva neonatal. Ver Enferm UFPE online. Recife. 2015 abr;9(4):7207-12.

17. Oliveira CS, Casagrande GA, Grecco LC, Golin MO. Perfil de recém-nascidos pré-termo internados na unidade de terapia intensiva de hospital de alta complexidade. ABCS Health Sci. 2015;40(1):28-32.

18. Balbi B, Carvalhaes MABL, Parada CMGL. Tendência temporal do nascimento pré-termo e de seus determinantes em uma década. Cienc Saúde Coletiva. 2016;21(1):233-41.

19. Santos DTA, Campos CSM, Duarte ML. Perfil das patologias prevalentes na gestação de alto risco em uma maternidade escola de Maceió, Alagoas, Brasil. Ver Brás Med Fam Comunidade. 2014 jan-mar;9(30):13-22.

20. Arrué AM, Neves ET, Silveira A, Pieszak GM. Caracterização da mormortalidade de recém-nascidos internados em unidade de terapia intensiva neonatal. Rev Enferm UFSM. 2013 jan/abril;3(1):86-92.

21. Almeida AC, Jesus ACP, Lima PFT, Araújo MFM, Araújo TM. Fatores de risco maternos para prematuridade em uma maternidade pública de Imperatriz-MA. Rev Gaúcha Enferm. 2012 jun;33(2):86-94.

22. Nascimento Júnior FJM, Silva JVF, Ferreira ALC, Rodrigues APRA. A síndrome do desconforto respiratório do recém-nascido: fisiopatologia e desafios assistenciais. Ciências Biológicas e da Saúde. 2014 nov;2(2):189-98.

Received: December 12, 2016
Approved: October 10, 2017
Published: January 25, 2018