

# HIGH-RISK NEWBORN: PROFILE OF FACTORS THAT CONTRIBUTED TO ADMISSION TO NEONATAL INTENSIVE CARE UNIT

LUDYMILLA CÂNDIDA RIBEIRO DA SILVA <sup>1</sup>, IGOR DA SILVA <sup>2</sup>, TÁRIK KASSEM SAIDAH <sup>3</sup>,  
PATRICIA GONÇALVES EVANGELISTA <sup>4</sup>

## ABSTRACT

**Introduction:** Deaths within the hospital environment now account for the largest proportion of infant deaths. There are several pre or perinatal situations that lead the NB to be considered at risk and require more specialized monitoring, sometimes requiring admission to a neonatal intensive care unit. **Objectives:** To describe the factors that take newborns to the intensive care unit.

**Methods:** Quantitative and retrospective cross-sectional study, carried out in a public maternity of reference in Goiânia-GO.

**Results:** The period analyzed was from January to December 2017 with a total of 259 newborns that passed through the Hospital's ICU during this period. The maternal profile is made up of women between 18 and 30 years old, 65% (167), primiparous 44% (115), without prenatal care 47% (121), and those who underwent prenatal care had less than 7 visits with 44% (114), the route of delivery was surgical (cesarean) with 54% (140), with gestational hypertensive disease being the most incident risk factor with 19% (50) followed by urinary tract infections also with 19% (49). The profile of the NBs, on the other hand, is male with 56% (146), with gestational age less than 36 weeks 77% (199), apgar first minute less than 7 with 57% (147) and fifth minute greater than 8 with 81% (2009), as risk factors present jaundice 88% (228), acute respiratory infection with 77% (199) and INN in 70% (181), with AIG presentation IN 80% (205) and with weight less than 2,500 grams 72% (182). **Conclusion:** The maternal profile is of women between 18 and 30 years old, primiparous, without prenatal care, born by cesarean section, with gestational hypertensive disease as the main risk factor. The profile of the NBs is of boys, with gestational age less than 36 weeks, apgar first minute less than 7 and apgar fifth minute greater than 8, icteric, with acute respiratory infection and neonatal infection, AGA and with weight less than 2,500 grams.

**KEYWORDS: NEWBORN, ICU. FACTORS. RISKS.**

## INTRODUCTION

The relevant technological advances in the health area in the last decades have determined the survival of a much larger number of newborns (NBs) considered at risk. However, the mortality rates of these newborns have been significant<sup>1</sup>.

Neonatal mortality gained relevance with the decrease in the infant mortality rate due to the decrease in the post-neonatal component. Deaths within the hospital started to account for the largest proportion of infant deaths<sup>2</sup>.

Even with advances in perinatology, the reduction of neonatal infant mortality is still difficult, as it is strongly linked to both biological factors and prenatal care, childbirth and the newborn<sup>3</sup>. Its prevention involves mainly investments in hospital services requiring more complex technology, as well as educational and public health actions<sup>4</sup>.

There are several prenatal or perinatal situations that lead the NB to be considered at risk and need more specialized monitoring, sometimes requiring admission to a neonatal intensive care unit (NICU)<sup>5</sup>. Among these we can

mention: prematurity, low or very low birth weight, congenital malformations, genetic syndromes, congenital infections, signs of perinatal asphyxia and other complications such as symptomatic hyperbilirubinemia, hypoglycemia and polycythemia<sup>6</sup>.

Prematurity alone constitutes a major public health problem, as it is a determinant of neonatal morbidity and mortality, especially in underdeveloped countries<sup>7</sup>.

Currently, the WHO adopts the classification related to the gestational age of the NB specifying that preterm is the child born with less than 37 weeks of gestational age (or with less than 259 days of gestation), at term those born between 37 and 41 weeks and six days of gestational age, and post-term those born with 42 weeks or more of gestational age. In this sense, general immaturity can lead to dysfunction in any organ in the body system<sup>9</sup>. Thus, the premature neonate is at risk of suffering a wide range of problems, including respiratory distress syndrome, apnea, bronchial pulmonary dysplasia, patent ductus arteriosus, ineffective term regulation, hyperglycemia, intraventricular hemorrhage

1 – Pediatrics resident at SMS/ HMDI  
2 – Gynecology and obstetrics resident at SMS/HMDI  
3 – PhD in Health Sciences at UFG  
4 – Doctoral candidate at UFG



## ADDRESS

PATRICIA GONÇALVES EVANGELISTA  
Alameda Emílio Póvoa, 165 - Vila Redenção,  
Goiânia - GO, 74845-250  
E-mail [centrodeestudosdmi@gmail.com](mailto:centrodeestudosdmi@gmail.com)

ge, gastrointestinal dysfunction, retinopathy, hyperbilirubinemia and infection<sup>7</sup>.

For these considerations, it is necessary within this unit to know the factors that watch over neonates in the Intensive Care Unit and thus establish the best care strategies seeking to improve the quality of care provided.

Therefore, the objective here is to describe the factors that take newborns to the Intensive Care Unit.

**METHODS**

Cross-sectional quantitative and retrospective study, carried out in a public maternity of reference in Goiânia-GO. The hospital is part of the Municipal Health Network of Goiânia and it specializes in humanized care in low, medium and high risk gynecology, obstetrics and neonatology and aims to develop health care for women and children, exclusively for users of the Unified Health System (Sistema Único de Saúde - SUS), it also acts as a teaching, research and extension hospital for courses related to health at the Federal University of Goiás (UFG).

The sample consisted of NBs admitted to the Neonatal Intensive Care Unit at the institution of choice, from January to December 2017, including all NBs who passed through the ICU in the established period. NBs whose collected data sheets were incomplete were excluded (Annex 1).

The maternal variables surveyed were maternal age, number of children, number of prenatal visits, maternal risk factors and type of delivery. Neonatal variables were Apgar score in the first and fifth minutes of life and gestational age, sex, risk factors and weight.

**RESULTS**

The period analyzed was from January to December 2017 with a total of 259 newborns who passed through the Hospital's ICU during this period.

	Number of patients (N=259)	
	N	%
<b>MATERNAL AGE</b>		
> 17	27	10
18 – 30	167	65
31 <	65	25
<b>NUMBER OF PREGNANCIES</b>		
1	115	44
2-3	103	40
<4	41	16
<b>PRENATAL CONSULTATIONS</b>		
> 7	114	44
8 <	24	9
0	121	47
<b>TYPE OF BIRTH</b>		
Cesarean	140	54
Normal	119	46
<b>MAIN RISK FACTORS</b>		
SHDP	50	19
Urinary tract infection	49	19
Water breaking	23	9
Smoker	11	4
Diabetes	7	3

Etiism	6	2.5
Illicit drugs	6	2.5
HELLP Syndrome	5	2
Oligohydramnios	3	1

Source: Research data, 2018

**Table 1 - Distribution of maternal characteristics of NBs in the HMDI ICU, Goiânia (GO), Brazil, 2017.**

	Number of patients (N=259)	
	N	%
<b>SEX</b>		
Female	113	44
Male	146	56
<b>GESTATIONAL AGE</b>		
< 36 weeks	199	77
> 37 weeks	60	23
<b>APGAR 1<sup>st</sup></b>		
< 7	147	57
8 >	112	43
<b>APGAR 5<sup>th</sup></b>		
< 7	50	19
8 >	209	81
<b>ICTERUS</b>		
Yes	228	88
No	31	12
<b>ACUTE RESPIRATORY INFECTION</b>		
Yes	199	77
No	60	23
<b>NEONATAL INFECTION</b>		
Yes	181	70
No	78	30
<b>PRESENTATION IN RELATION TO GESTATIONAL AGE</b>		
AGA	205	80
LGA	22	8
SGA	32	12
<b>WEIGHT RANGE (IN GRAMS)</b>		
<2.500	186	72
>2.501	73	28

Source: Research data, 2018.

**Table 2 - Distribution of the characteristics of the NBs admitted to the HMDI ICU, Goiânia (GO), Brazil, 2017.**

**DISCUSSION**

In Brazil, neonatal intensive care has progressed remarkably in the last 20 years, somewhat following the global trend. Assessing risk becomes a very difficult task, since the concept of risk is associated with the possibilities and the link between a risk factor and damage is not always explained. Specifically, the concept of risk newborns emerges so that it is possible to identify the degrees of vulnerability in the periods of pregnancy, as well as those prior to them, in addition to the birth conditions of these children<sup>13</sup>. Among the considerations, risk newborns are those who have problems in their development, surviving events that lead to traumatic or premature birth, resulting from the influence of biomedical factors, such as biological, genetic and perinatal factors, in addition to environmental factors such as parent-baby interaction, socioeco-

conomic situation, family situation, among others<sup>15</sup>.

The maternal profile is made up of women between 18 and 30 years old, 65% (167) and 44% primiparous (115). Brauner et al (2015) believes that the maternal age group that most predominates is 30 to 39 years old and primiparous, which comprises the woman's fertile age.

The way of delivery was surgical (cesarean) with 54% (140). Studies by Lima et al (2015) to describe the clinical aspects of newborns admitted to the NICU of a reference hospital in the northern region of the country found young adult mothers, with inadequate prenatal care (72.6%), cesarean deliveries (56.0%) corroborating this research. Silva et al (2015) reveals that the operative mode of delivery can be considered a relevant procedure for the reduction of perinatal disorders, which increases the survival of newborns, a fact also found in the studies by Tragante (2009) and Pieszak et al., (2013).

Gestational hypertensive disease was the most incident risk factor with 19% (50) followed by urinary tract infections, with 19% (49) disagreeing with Brauner et al (2015) in his findings where he stated hypertension and smoking as the main risk factors. Prado et al (2017) reveal that pregnant women with hypertension are 3.47 (95% CI: 1.37 - 8.81) times more likely to have a premature child and 2.55 (1.03 - 6.32) times more likely to have a child with low weight than those without risks to pregnancy.

The study showed a profile of women of 47% who did not have prenatal care and those who had less than 7 consultations, showing difficulty in adhering to the prenatal care program which directly impacts the health of the NBs. Kassari et al (2013) reveals that the chance of neonatal deaths is greater in the group of mothers with inadequate prenatal care, revealing how health care during pregnancy plays an important role in the outcome. According to Moura et al (2011) hypertension is still the biggest cause of fetal or newborn deaths, thus being very important to have real knowledge about this gestational pathology.

The profile of the NBs is male, with 56% (146), with gestational age under 36 weeks 77% (199). Nowadays, the birth of preterm children is still an important cause of perinatal mortality. It is estimated that 13 million children worldwide are born prematurely each year<sup>20</sup>. The WHO defines PTNB, the live newborn with less than 37 weeks, that is, less than 259 days of gestation, counting from the first day of the last menstrual period, regardless of birth weight<sup>19</sup>. Among these factors that lead to preterm birth are: race, age, nutritional status, weight gain during pregnancy, socioeconomic level, professional activity, smoking, drug use, obstetric bad past, prenatal follow-up, uterine abnormalities, clinical and obstetric complications, fetal conditions, births, twin or multiple pregnancies, premature rupture of membranes, fetal malformation, polyhydramnios during pregnancy, abdominal surgery during pregnancy, prior conization, chorioamnionitis, maternal hyperthermia, uterine bleeding, among others<sup>22, 23, 24, 25</sup>.

NBs had a prevalence of Apgar 1st minute less than 7

with 57% (147) and 5th minute greater than 8 with 81%. Ribeiro et al (2009) highlights that the low Apgar score in the 5th minute is considered the most accurate index for the prognosis of the child's neurological health and death, the Apgar directly reflects that the vitality conditions of the newborn is related to the quality of care received at delivery, the lower the Apgar score in the 1st and 5th minutes of life, the lower the chances of survival.

In the study, 80% (205) of newborns weighing less than 2,500 grams were found 72% (182). Several authors have studied the impact of birth weight on the levels of morbidity and mortality. This variable has occupied an important place when related to illness and death in the first year of life<sup>20</sup>. Low birth weight occurs due to multiple factors. The risk factors that contribute to this condition are delayed intrauterine growth, prematurity, pre-gestational maternal weight less than 50 kg, interpartum interval less than 18 months, history of maternal malnutrition, previous premature births, multiparity (over three children), primiparous, previous LBW, active and passive smoking, low maternal education, teenage mothers or those over the age of 35, absence or insufficiency of prenatal care, maternal arterial hypertension, among others, which can interfere alone or associated<sup>4</sup>. Prematurity (72%) and low birth weight (69%) in studies by Quaresma et al (2018) were the main diseases associated with hospitalization during the neonatal period.

As risk factors they present jaundice 88% (228). The newborn's hyperbilirubinemia or jaundice is known as a pathological entity that must be promptly identified and differentiated from the physiological jaundice present in many babies<sup>23</sup>. The slightly elevated concentration of indirect bilirubin, seen in two thirds of newborns, does not necessarily indicate a disease. However, it is important to distinguish physiological from pathological jaundice, which is characterized as one of the factors that may lead to the need for the newborn's admission to the neonatal ICU<sup>26</sup>.

Acute respiratory infection was present in 77% (199) and neonatal infections in 70% (181). Infection remains the main determinant of mortality in the neonatal period. Studies carried out by Rolim and Eickmann (2016) showed that maternal factors, understood as the use of antibiotics during pregnancy and the lack of prenatal care, were related to the appearance of neonatal sepsis. For Alves (2011) sepsis is a devastating complication and an important cause of morbidity and mortality, highlighting the emerging need to systematize effective interventions.

## CONCLUSION

The maternal profile is of women between 18 and 30 years old, primiparous, without prenatal care, birth by cesarean section, with gestational hypertensive disease as the main risk factor.

The profile of the NBs is of boys, with gestational age less than 36 weeks, with apgar first minute less than 7 and apgar fifth minute greater than 8, jaundiced, with acute

respiratory infection and neonatal infection, AGA and weighing less than 2,500 grams.

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