ORIGINAL ARTICLE

PROFILE OF HIGH-RISK NEWBORNS HOSPITALIZATION AT A NEONATAL INTERMEDIATE CARE UNIT

PERFIL DE INTERNACIÓN DE RECIÉN NACIDOS DE ALTO RIESGO EN UNA UNIDAD DE CUIDADO INTERMEDIARIO NEONATAL

RESUMO

Objetivo: traçar o perfil dos neonatos de alto-risco. Método: estudo documental, retrospectivo e transversal, com abordagem quantitativa, no qual foram utilizados 211 prontuários de neonatos internados em uma unidade de cuidado intermediário neonatal. As variáveis estudadas foram: gênero; peso; doença de base; e motivo da alta. Os dados coletados foram analisados no Statistical Package for the Social Sciences, versão 20, com base em frequências simples e absoluta e por meio de análise comparativa. Resultados: quanto ao gênero, o sexo masculino foi o mais prevalente com 55,45%; sobre o tipo de afecção, predominou a taquipneia transitória do recém-nascido com 26,06%; a respeito do peso, 78,67% dos recém-nascidos estavam dentro da normalidade; já em relação ao tipo de alta, a maioria apresentou alta com melhora clínica (93,36%); e os casos de óbitos corresponderam a 3,32%. Conclusão: conhecendo o perfil desses neonatos colabora para o planejamento de políticas públicas que reduzam os óbitos neonatais. Descriptors: Perfil de Saúde; Enfermagem Neonatal; Neonatal Mortalidade.

ABSTRACT

Objective: to describe the profile of high-risk neonates. Method: transversal, retrospective and documentary study with quantitative approach, in which 211 medical records of newborns admitted to a neonatal intermediate care unit were used. The variables studied were: gender; weight; underlying disease; and discharge reason. The data collected were analyzed using the Statistical Package for the Social Sciences, version 20, based on simple and absolute frequencies, and through comparative analysis. Results: as for gender, males were the most prevalent with 55.45%; regarding the type of disease, transient tachypnea of the newborn predominated with 26.06%; with respect to weight, 78.67% of the newborns were within the normal range; in relation to the type of discharge, most of the newborns had been discharged with clinical improvement (93.36%); and cases of deaths corresponded to 3.32%. Conclusion: knowing the profile of these newborns collaborates for the planning of public policies aimed at reducing neonatal deaths. Descriptors: Health profile; Neonatal Nursing; Neonatal Mortality.
INTRODUCTION

Infant mortality rate is considered one of the most important epidemiological indicators, because it reflects the socioeconomic development, social inequality, and the levels of health and living conditions of a region. It corresponds to the number of deaths of children under one year of age and the number of live births in certain location and time period, calculated on the basis of every thousand live births. This coefficient can be classified as perinatal mortality (fetal deaths with 28 or more weeks of gestation or born alive with less than 7 days of life) and neonatal (deaths of children with less than 28 days of life).

Neonatal mortality can be classified as: early (between 0 and 6 days of life); late (between 7 and 27 days of life); or post-neonatal (between 28 and 364 days of life). In 2004 in Brazil, infant mortality rate was 22.59 deaths per thousand live births, whereas in 2008 it was estimated at 19.38 with reduction in all regions of the country. According to these data, infant mortality rate had 50% reduction between 1990 and 2008. Despite the decline observed over the years in Alagoas, infant mortality remains a public health problem, since its level is still high and inconsistent when compared to the number of deaths occurring in the states of the south and southeast regions.

Neonatal mortality accounts for almost 70% of the deaths in the first year of life. However, other studies have confirmed that the majority of these deaths occurs in the first days of life, in particular on the first day (representing 25%). This way, neonatal mortality became the primary component of deaths in that period.

As shown in the Department of Hospital Epidemiology (NHEP) of Santa Monica Maternity School (MESM), located in the city of Maceió, AL—which is the state reference center, specialized in medium and high complexity care provided to pregnant women and high-risk newborns—168 deaths occurred in the institution in 2011, which is a significant high number.

The rationale for this study is based on the relevance of the problem, since Maceió has high rates of infant mortality for many years, which is one of the largest in the country, especially in the neonatal period corresponding to the mortality rate of 11.4/1,000 live births in 2011. The Computer Department of the Unified Health System (SUS) recorded 210 cases of neonatal deaths in Maceió, the capital city of Alagoas, in 2011 and 156 cases in 2012 with 70 early neonatal deaths.

Although neonatal mortality rate remains high, it is important to note that neonatal care has advanced considerably in recent decades with the introduction of more effective therapeutic and technological resources and specialized human resources. However, in order to provide appropriate nursing care, technical knowledge about diseases, complementary examinations, and treatment are not enough; there is also a need to know effectively the target population to be cared for regarding their relevant characteristics that may aggravate patients’ clinical and hemodynamic picture.

From this point of view, it is possible to infer the need to characterize what a low- and high-risk newborn is. On the other hand, there is a need to first conceptualize the term ‘risk’, since it is the probability that an individual or group of people have to present damage to their health in the future.

A low-risk newborn is considered that who is born with gestational age between 37 and 42 weeks, good vitality, adequate intrauterine growth, and absence of pathologies or malformations. On the other hand, a high-risk newborn is only considered that with birth weight less than or equal to 2000 g and/or Apgar score less than seven in the fifth minute of life. This children population has an increased risk for changes in growth and development. From this context, this study aims to describe the profile of high-risk neonates.

METHOD

This is a transversal, retrospective and documentary study with quantitative approach, in which we used a total of 211 medical records, including all newborns aged between zero and seven days admitted upon self-referral at the Neonatal Intermediate Care Unit (NICU) of the Santa Maria Simple Society Children’s Clinic Ltd., which is a reference institution of medium-complexity care provided to to high-risk newborns in Maceió, from January to June 2011 and 2012.

The variables studied were: gender; weight; basic pathology by means of medical diagnosis; and discharge reason. The diseases were identified according to the International Classification of Diseases and Related Health Problems, also known as the International Classification of Diseases - ICD 10, which aims at standardizing the coding of diseases and other harms to health.

Regarding the statistics, all data were expressed as total gross and percentages. The...
data collected were analyzed using the SPSS (Statistical Package for the Social Sciences) version 20, based on simple and absolute frequencies, and through comparative analysis between the results, taking into consideration the nature of the distributions of the variables values, and subsequently presented in tables and figures.

Prior to this study, the project was approved by the direction of the clinic after the presentation of the acceptance of the research term. We did not conduct interviews and questionnaires were not applied to humans. This field research consists of the survey of documents that the institution keeps in its computerized database. The project was not forwarded to the Committee of Ethics in Research because this is a documentary study without direct contacts with the subjects of the research.

**RESULTS**

We recorded 98 hospitalizations in the first half of 2011; among which 54 were male and 44 female. In the same semester of 2012, 113 newborns were admitted, of which 63 were male and 50 female, totaling 211 admissions. With respect to genre, according to the population studied in 2011 and 2012, 55.45% were male and 44.55% female.

<table>
<thead>
<tr>
<th>Newborns' gender</th>
<th>2011</th>
<th>2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Newborns=98</td>
<td>Newborns=113</td>
<td>Newborns=211</td>
</tr>
<tr>
<td>Male</td>
<td>Newborns (%)</td>
<td>Newborns (%)</td>
<td>Newborns (%)</td>
</tr>
<tr>
<td>Male</td>
<td>54 (55.10%)</td>
<td>63 (55.75%)</td>
<td>117 (55.45%)</td>
</tr>
<tr>
<td>Female</td>
<td>Newborns (%)</td>
<td>Newborns (%)</td>
<td>Newborns (%)</td>
</tr>
<tr>
<td>Female</td>
<td>44 (44.89%)</td>
<td>50 (44.24%)</td>
<td>94 (44.55%)</td>
</tr>
</tbody>
</table>

Table 1. Sociodemographic characteristics of the newborns at the NICU admitted in the first half of 2011 and 2012.

According to data obtained in this research, the number of hospital admissions from May to June 2012 was the highest. Regarding distribution, as to the types of conditions that prevailed in neonates in the first half of 2011, the main were: transient tachypnea of the newborn (TTNB) (23.47% / 23 cases); neonatal infection (15.31% / 15 cases); congenital syphilis (15.31% / 15 cases); prematurity (12.24% / 12 cases); septicemia (12.24% / 12 cases); neonatal jaundice (12.24% / 12 cases); pneumonia (5.10% / 5 cases); and anoxia (4.08% / 4 cases).

![Figure 1. Distribution of newborns' diseases at the NICU, admitted in the first half of 2011. Source: Computerized database of Santa Maria Simple Society Children's Clinic Ltda., 2012.](image)

No major changes occurred in the first half of 2012. The disease with greater prevalence continued to be TTNB (28.32% / 32 cases), followed by neonatal infection (17.70% / 20 cases), pneumonia (13.27% / 15 cases), prematurity (10.62% / 12 cases), septicemia (10.62% / 12 cases), neonatal jaundice (10.62% / 12 cases), congenital syphilis (7.08% / 8 cases), intestinal infection (5.10% / 5 cases), and finally anoxia (0.88% / 1 case), congenital syphilis (15.31% / 15 cases); prematurity (12.24% / 12 cases); septicemia (12.24% / 12 cases); neonatal jaundice (12.24% / 12 cases); pneumonia (5.10% / 5 cases); and anoxia (4.08% / 4 cases).

These were the most prevalent diseases in high-risk neonates, since they have survived a traumatic or premature birth, especially due to the fact that most mothers had undergone a high-risk pregnancy.
With respect to weight, in the first half of 2011, the newborns with appropriate birth weight (>2,500 g) achieved a higher prevalence corresponding to 82.65% (81 newborns), followed by 16.32% (16 newborns) who had low birth weight (≤2,500 g), and only 1.02% (01 newborn) with very low birth weight (≤1,500 g).

In 2012, 85 newborns with appropriate birth weight—corresponding to 75.22% of neonates who were admitted during this period—and 28 newborns with low birth weight (24.77%) were recorded. Figure 4 shows the distribution of subjects with respect to the type of discharge. In most medical records, newborns showed higher prevalence of discharge with clinical improvement (93.36%). Transfer cases due to the need of more advanced support corresponded to 3.32% (7 cases), coinciding with the amount of deaths (3.32% / 7 cases). It is worth mentioning that more hospitalizations with less deaths and transfers occurred in 2012 in comparison to 2011.
Regarding the distribution of deaths that occurred in the first half of 2011 and 2012 among the 211 participating patients, the results show that all cases (7 deaths) fall in early neonatal mortality, ranging from one to five days of life and most of them were male.

**DISCUSSION**

With respect to gender, males were the most prevalent with 55.45% of the population studied. The demand was higher in both semesters, reaching the highest indicators in May and June 2012. A research conducted in 2006 with 760 newborns at the Maringá University Hospital, located in the State of Paraná, revealed that 391 (51.5%) of them were male. However, it is worth noting that male newborns have a higher probability of acquiring a disease mainly during the first 28 days of life. This results has also been found in another study in the national literature.

With regard to hospitalizations by age group in Alagoas, it can be observed that children under one year of age being admitted are mostly male. This is an important datum pointed out in this study.

In the distribution as to the type of disease that affects neonates, the predominant were: TTNB (55 cases); neonatal infection (35 cases); prematurity (24 cases); sepsisemia (24 cases); neonatal jaundice (24 cases); congenital syphilis (23 cases); and pneumonia (20 cases). When comparing the first halves of 2011 and 2012, it can be observed that there has been a reduction in the number of cases of congenital syphilis in 2012 and that the most prevalent disease was TTNB. This result is a reflection of the demand that the institution meets, since a major part of these neonates' pregnancies were high-risk and they were born by cesarean deliveries.

The national literature corroborates with the results presented, since the leading cause of neonatal mortality are acute intrauterine infections, respiratory problems, malformations, prematurity, and postnatal infection, whose importance varies according to the operating conditions of the maternity and the nursery.

With respect to TTRN, this was the most prevalent disease in the study. Scientific evidence suggests that TTRN has been attributed to a delay in the reabsorption of fetal lung liquid. In this way, pulmonary immaturity caused by inadequate surfactant production compromises the life of the neonate and requires immediate circulatory and respiratory support for the stabilization of the clinical picture. It is important to mention that the cesarean delivery is considered as an important risk factor for TTNB.

With respect to weight, this is considered a relevant indicator of newborns' health according to the World Health Organization, because it reflects the life conditions of the individuals that have conceived those newborns. In this study, the newborns who had higher prevalence were the ones that had appropriate birth weight. In the first half of 2011, the rate was 82.65% and in 2012 it was 75.22%.

Linking gender to weight, in 2011, 30.61% of female neonates had appropriate birth weight, 11.22% had low birth weight, and 0.02% had very low birth weight. With respect to males, 46.94% of neonates had appropriate birth weight, and 11.22% had low birth weight. On the other hand, in the first half of 2012, 29% of female neonates had appropriate birth weight and 13.89% had low birth weight. Regarding males, 49.07% of neonates had
appropriate birth weight and 7.42% had low birth weight.

Comparing the semesters, the reduction of the demand on the part of male newborns that had low birth weight drew attention, since in 2011 it was 11.22% (11 cases) and in 2012 it was only 7.40% (8 cases). Taking low birth weight cases into consideration, female neonates showed a higher prevalence throughout the period studied. As shown by other national studies on newborns, most neonates who had low birth weight were born preterm; both are important risk factors associated with neonatal mortality, since they have a higher risk of mortality.6, 8, 20

The distribution of subjects with respect to the type of discharge shows that newborns had higher prevalence of discharge with clinical improvement in most medical records (93.36%). Transfer cases occurred due to the need of more advanced support and they corresponded to 3.32%, coinciding with the amount of deaths (3.32%).

It is worth mentioning that in 2012 there were more hospitalizations with less deaths and transfers than in 2011, revealing improvement of care provided by the institution. The results of this study are consistent with those in the literature, showing that the distribution of deaths had higher prevalence of early neonatal mortality.6, 21–25

**CONCLUSION**

The profile of high-risk neonates admitted to the NICU was mostly composed of male newborns affected by TTNB with appropriate birth weight and discharged with clinical improvement. It is worth mentioning that the number of early neonatal deaths found was high.

Knowing the profile of these neonates contributes to the understanding of the negative outcomes of social vulnerability and associated risk factors such as: low birth weight; prematurity; and cesarean delivery. The results found in this study are of great importance, because they can collaborate to create new prevention strategies for high-risk pregnancy and premature birth. In addition, these results will collaborate to improve care provided; favoring the reduction of neonatal mortality and increasing life expectancy of neonates and their mothers. In addition, this information can be used in other studies serving as subsidies for the formulation of public policies for the reduction of neonatal deaths in the city.

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Corresponding Address
Eduardo Motta de Vasconcelos
Rua Frei Caneca, 130
Bairro Consolação
CEP: 01307-000 – São Paulo (SP), Brazil