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ORIGINAL ARTICLE

FACTORS INFLUENCING ON CARDIOPULMONARY RESUSCITATION AND PROGNOSIS IN A NEONATAL ICU

FATORES QUE INFLUENCIAM NA RESSUSCITAÇÃO CARDIOPULMONAR E NO PROGNÓSTICO DE NEONATOS EM UMA UTI

FACTORES QUE INFLUYEN EN LA RESUCITACIÓN CARDIOPULMONAR Y EL PRONÓSTICO EN UNA UCI NEONATAL

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ABSTRACT

Objective: to verify the main factors influencing on cardiopulmonary resuscitation and prognosis in a neonatal intensive care unit (NICU). **Method:** cross-sectional study with a retrospective nature, quantitative and descriptive, conducted in a NICU in July and August 2012, with data collection from medical records of neonates who suffered cardiorespiratory arrest and were reanimated within the period from January to March 2012, after study approval by the Research Ethics Committee of the School of Medicine of São José do Rio Preto (FAMERP), under the Opinion 32,509. **Results:** out of the 61 neonates at the NICU within the period, 58 medical records were accessed; 9 (15.5%) were selected for the survey. There were 77.8% of neonates born premature. As for the etiology of cardiorespiratory arrest, 89% had a respiratory origin. **Conclusion:** the main factors influencing on cardiopulmonary resuscitation and prognosis of neonates at a NICU are: prematurity, prior comorbidities (especially with a respiratory origin), and early intervention by the health team. **Descriptors:** Cardiopulmonary Resuscitation; Neonatal Period; Neonatal Intensive Care Units.

RESUMO

Objetivo: verificar os principais fatores que influenciam a ressuscitação cardiopulmonar e o prognóstico em uma unidade de terapia intensiva neonatal (UTIN). **Método:** estudo transversal de caráter retrospectivo, quantitativo e descritivo, realizado em UTIN em julho e agosto de 2012, com coleta de dados em prontuários de neonatos que apresentaram parada cardiorrespiratória e foram reanimados no período de janeiro a março de 2012, após a aprovação do estudo pelo Comitê de Ética em Pesquisa da Faculdade de Medicina de São José do Rio Preto (Famerp), sob o Parecer n. 32.509. **Resultados:** dos 61 neonatos internados na UTIN no período, foram acessados 58 prontuários; 9 (15,5%) foram selecionados para a pesquisa. Nasceram prematuros 77,8% dos neonatos. Quanto à etiologia da parada cardiorrespiratória, 89% foram de caráter respiratório. **Conclusão:** os principais fatores que influenciam a ressuscitação cardiopulmonar e o prognóstico de neonatos internados em uma UTIN são: prematuridade, comorbidades prévias (principalmente de origem respiratória) e intervenção precoce da equipe de saúde. **Descritores:** Ressuscitação Cardiopulmonar; Período Neonatal; Unidades De Terapia Intensiva Neonatal.

RESUMEN

Objetivo: verificar los principales factores que influyen en la resucitación cardiopulmonar y el pronóstico en una unidad de cuidados intensivos neonatales (UCIN). **Método:** estudio transversal con carácter retrospectivo, cuantitativo y descriptivo, realizado en una UCIN en julio y agosto de 2012, con recogida de datos en prontuarios de neonatos que sufrieron parada cardiorrespiratoria y fueron reanimados en el período de enero a marzo de 2012, después de la aprobación del estudio por el Comité de Ética en Investigación de la Facultad de Medicina de São José do Rio Preto (Famerp), bajo la Opinión 32.509. **Resultados:** de los 61 neonatos internados en la UCIN en el período, se tuvo acceso a 58 prontuarios; 9 (15,5%) fueron seleccionados para la encuesta. Hubo 77,8% de neonatos nacidos prematuros. En cuanto a la etiología de la parada cardiorrespiratoria, 89% tenían un carácter respiratorio. **Conclusión:** los principales factores que influyen en la resucitación cardiopulmonar y el pronóstico de neonatos en la UCIN son: prematuridad, comorbilidades previas (especialmente con un origen respiratorio) e intervención precoz del equipo de salud. **Descriptor:** resucitación cardiopulmonar; período neonatal; unidades de cuidados intensivos neonatales.

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INTRODUCTION

In Brazil, about 3 million children are born every year, and 300 thousand of them need support to initiate and sustain adequate breathing.¹⁻² Worldwide, from 4 to 7 million need some kind of assistance at birth, per year, and 359 thousand neonatal deaths are avoided by means of resuscitation techniques at birth.³

The neonatal period, from 0 to 28 days⁴, is characterized by weakness of the human being, with high risk of sequelae and high rates of morbidity and mortality.⁵ Neonatal mortality accounts for about 60 to 70% of infant mortality. And it is the first day of life that gathers most of the infant deaths in Brazil, about 25%.²

So, we notice that there is a relation between intrauterine health conditions, at birth and within the neonatal period, with chronic degenerative problems in adulthood^{2,6}, and improving neonatal care can reduce mortality due to preventable causes and reduce individual’s neurological sequelae, which affect the quality of life of children and their families, besides generating expenditures for society.³ There is a need, therefore, for early intervention, preventing the occurrence of cardiorespiratory arrest (CRA) among neonates. To do this, it is of great importance identifying the main factors that lead to this condition.

OBJECTIVE

- Verify which are the main factors influencing on cardiopulmonary resuscitation and prognosis of neonates in a neonatal intensive care unit.

METHOD

This is a cross-sectional study with a retrospective nature, besides a quantitative and descriptive approach, conducted in the neonatal intensive care unit (NICU) of a school hospital in São José do Rio Preto, São Paulo, Brazil. This is a large hospital, at the tertiary and quaternary level, with a capacity to provide 720 beds.

The sample consisted of 61 medical records of neonates hospitalized at the NICU within the period from January 1 to March 31, 2012, and those who had only cardiac arrest/respiratory arrest or those with a “closed prognosis” were excluded.

The medical record contained 23 questions which referred from time of birth to the characteristics of the pre-, intra- and post-CRA period. The database was filled in a spreadsheet of the software *Microsoft Excel*[®], and the results, analyzed by simple frequency and average, are expressed in figures.

The survey was conducted after approval by the Research Ethics Committee of the School of Medicine of São José do Rio Preto (FAMERP), under the Opinion 32,509, according to Resolution CNS 196/96.

RESULTS

Within the proposed period 61 neonates were admitted to the NICU, but it was possible to access 58 records. Out of these, 9 (15.5%) were used in the survey, because they met the inclusion criteria.

Figure 1 points out that neonates had, on average, 37 hours of life at the time of CRA.

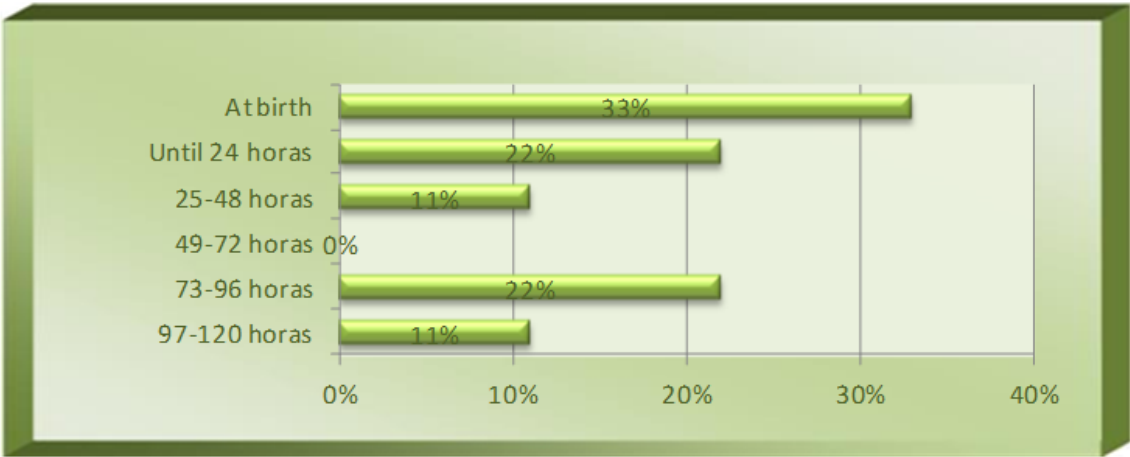


Figure 1. Percentile of age at the time of cardiorespiratory arrest.

According to gestational age at birth, 22.2% were born at term and 77.8% were preterm, ≤ 37 weeks.⁶

The average weight at birth was 1,957 g and the proportion of neonates per 500 g is illustrated by Figure 2.

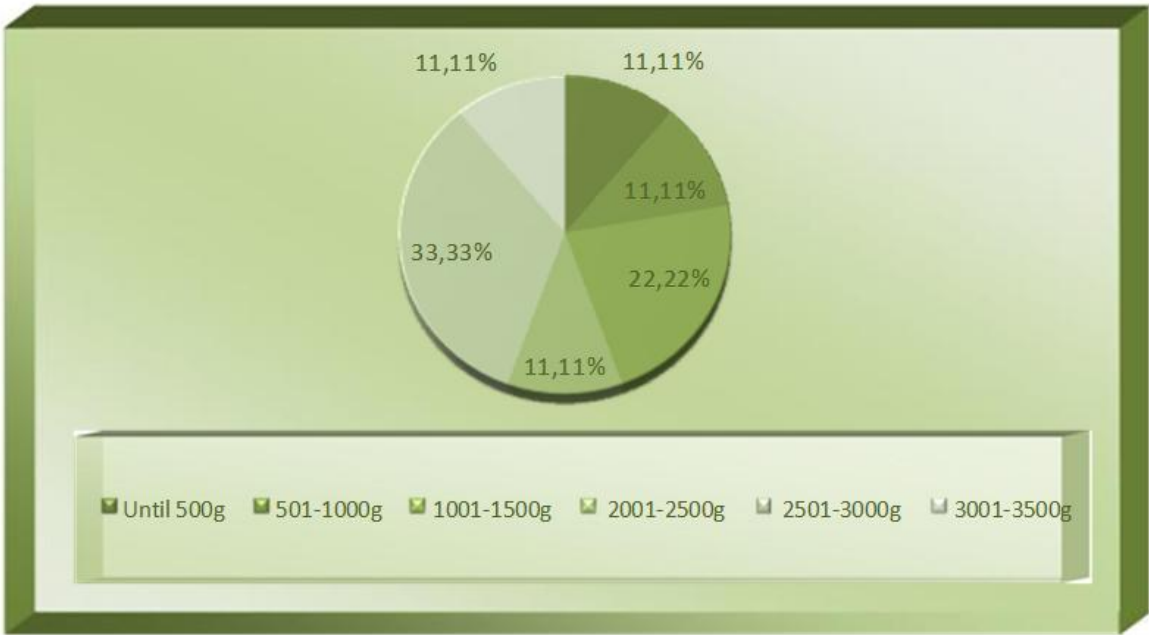


Figure 2. Percent by weight at birth.

Each neonate had, on average, 2.55 comorbidities, mainly pneumothorax (33.3%), neonatal respiratory distress

syndrome/hyaline membrane disease (33.3%), and neonatal anoxia (22.2%).

Figure 3 shows the neonate’s length of stay in the hospital unit.

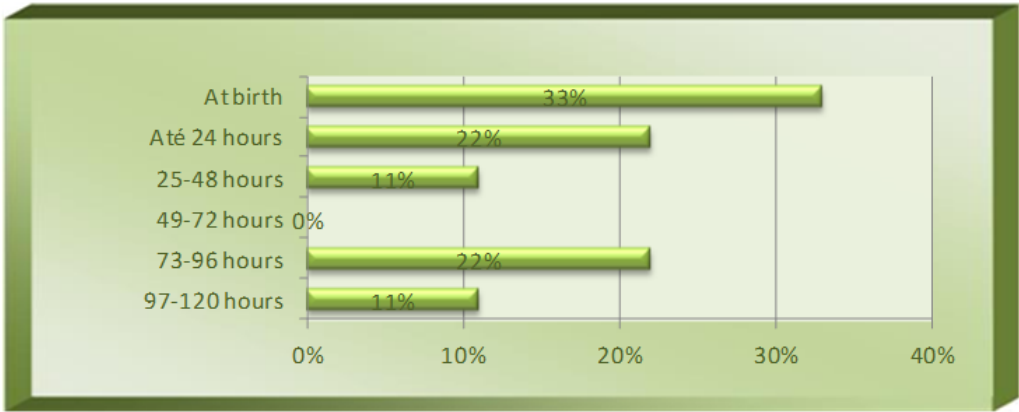


Figure 3. Percentile of hospital stay for 24 hours.

Regarding the etiology of CRA, 89% of cases had a respiratory origin and 11% had a nonspecific cause.

As for the techniques used during cardiopulmonary resuscitation (CPR), it was found that: all umbilical cord ligations were performed immediately after birth; the polyethylene plastic bag was not used, because the neonates were housed in heated incubators; therapeutic hypothermia was performed in 11% of cases; volume expansion, with crystalloid and plasma solutions, was performed in 55.5% of neonates; in all cases, airways and trachea were aspirated, by using

oxygen therapy and chest compressions. All infants were intubated, ventilated within the CRA period using positive pressure and, at some time, they used the mechanical ventilator. During labor, bag and face mask were used in 11% of them. Neonates already using orotracheal tube (OTT) and ventilated with manual balloon (44%) had a better response to this technique than to the mechanical ventilator. Adrenaline was administered in 78% of cases, out of which 43% with continuous dosing up to 0.5 mcg/kg/min and 57% with a continuous dose of 0.5-1 mg/kg/min (Figure 4).

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