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ORIGINAL ARTICLE

Risk factors associated with growth failure in the follow-up of very low birth weight newborns☆

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Preterm infant;
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Abstract

Objective: To determine risk factors during neonatal hospital stay and follow-up associated with failure to thrive in the first year of life of very low birth weight newborns.

Methods: Study of preterm very low birth weight newborns followed from 2006 to 2013 in a public institutional hospital program. The study included newborns that attended at least one appointment in each of the three periods: Period I, up to 3 months of corrected age (CA); Period II, 4–6 months of CA; and Period III, 7–12 months of CA. The variables were analyzed by logistic regression with XLSTAT 2014 software (Microsoft®, WA, USA). Failure to thrive (*Z*-score below −2 SD) was classified as a dichotomous dependent variable (0 – failure/1 – success), while the other variables were classified as explanatory variables for the hospitalization periods and for each of the follow-up periods (I, II, and III).

Results: Children born adequate for gestational age increased the chance of *Z*-score for weight at discharge > −2 SD (OR = 10.217; 95% CI: 1.117–93.436). Metabolic bone disease and retinopathy of prematurity in Period I, as well as hospital readmissions in Periods II and III during follow-up increased the chance of *Z*-score < −2 SD.

Conclusion: Failure to thrive is influenced by intrauterine factors and, subsequently, by several morbidities, both in the birth and hospitalization period, as well as in the post-discharge period and thus, such variables should be prioritized in the follow-up.

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PALAVRAS-CHAVE
Prematuro;
Crescimento;
Recém-nascido de muito baixo peso;
Fatores de risco

Fatores de risco associados à falha de crescimento no seguimento de recém-nascidos de muito baixo peso

Resumo
Objetivo: Determinar fatores de risco do período de internação neonatal e do seguimento ambulatorial associados à falha de crescimento no primeiro ano de vida de recém-nascidos de muito baixo peso.
Métodos: Estudo com crianças nascidas prematuras de muito baixo peso em acompanhamento de 2006 a 2013 em Ambulatório de Alto Risco de um Hospital Escola. Incluídas aquelas que realizaram pelo uma consulta em cada um dos três períodos assim determinados: Período I – até 3 meses de Idade Corrigida (IC); Período II – entre 4 a 6 meses de IC e Período III – entre 7 a 12 meses de IC. As variáveis foram analisadas por regressão logística com programa XLStat 2014 (Microsoft®, WA, EUA). A falha de crescimento (escore z abaixo de −2 DP) classificada como variável dependente do tipo dicotômica (0 – falha/1 – sucesso) e demais variáveis classificadas como variáveis explicativas para os períodos de internação e para cada um dos períodos de seguimento (I, II e III).
Resultados: Nascer Adequado para a Idade Gestacional aumenta a chance de apresentar escore Z do peso na alta hospitalar acima de −2 DP (OR = 10,217; IC95% 1117–93,436). Doença Metabólica Óssea e Retinopatia da Prematuridade, durante o Período I e reinternações nos Períodos II e III de seguimento aumentam a chance de escore Z abaixo de −2 DP.
Conclusão: A falha de crescimento é influenciada por fatores intrauterinos e posteriormente por diversas morbidades, tanto no período da internação como no pós-alta, tais variáveis estudadas deveriam ser priorizadas no seguimento.

Introduction

Failure to thrive during early childhood can have permanent harmful effects, especially in preterm infants (PI)[1] as growth, mainly in those born with very low birth weight (VLBW), is influenced by intrauterine and birth factors, as well as variables during hospitalization and post-hospital discharge,[2] causing future problems such as neurodevelopmental alterations[3,4] and metabolic syndrome.[5,6]

Studies have addressed the influence of the hospitalization period and the first years of life after discharge on the growth of PI,[7–10] demonstrating that birth (weight, weight/GA ratio) and hospitalization (hospital length of stay, presence of hyaline membrane disease) variables have an effect on growth in the short- and long term.[11]

During hospitalization, the VLBW preterm infant has restricted growth, with significantly lower rates than the intrauterine rates. Most of these PI are born weighing between the 10th and 90th percentiles of the intrauterine growth curve, considered adequate for gestational age – (AGA). However, at the discharge from the neonatal intensive care unit (NICU) or at 36 weeks post-conception age, they are below the 10th percentile of the same curve, characterizing extrauterine growth restriction (EUGR).

This situation influences the prognosis of PI, both in relation to growth and to development, leading to failure to thrive in childhood, stunting, and underweight, with consequences in adulthood.[3,12] Factors associated with EUGR include: nutritional practice, male gender, need for ventilation on the first day of life, use of mechanical ventilation for long periods, hospital length of stay, and complications inherent to premature birth, such as bronchopulmonary dysplasia (BPD), necrotizing enterocolitis (NEC), and late sepsis.[13]

The post-hospital discharge and outpatient follow-up periods can also be accompanied by several complications, such as BPD, which favors frequent respiratory complications, resulting in recurrent hospitalizations early in life; gastroesophageal reflux; presence of visual and auditory deficits; psychomotor developmental delays; and cerebral palsy.[14,15]

Given the current survival rates of PI, especially those with VLBW, it becomes prudent to search for better long-term results, with growth constituting the critical point to be emphasized in the care of premature infants. Thus, the authors emphasize the need to identify complications during the hospital stay and post-discharge periods to understand the growth dynamics of the PI discharged from the NICU. Hence, the aim of this study was to assess variables during the NICU hospitalization and outpatient follow-up periods that can influence failure to thrive in VLBW PI.

Methods

This study was carried out based on medical records of preterm children born with VLBW, followed at the High-Risk Outpatient Clinic of a teaching hospital located in the Western region of the state of Paraná, Brazil. This service treated 305 children from the NICU during the study period; of this total, 101 were VLBW PI, the subject of the present study.

The study included the VLBW PI followed between 2006 and 2013 that had, after hospital discharge, at least three appointments at the High-Risk Outpatient Clinic during the