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REVIEW ARTICLE

Motor development of preterm infants assessed by the Alberta Infant Motor Scale: systematic review article[☆]

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KEYWORDS

Prematurity;
Child development;
Motor development

Abstract

Objective: Premature newborns are considered at risk for motor development deficits, leading to the need for monitoring in early life. The aim of this study was to systematically review the literature about gross motor development of preterm infants, assessed by the Alberta Infant Motor Scale (AIMS) to identify the main outcomes in development.

Data source: Systematic review of studies published from 2006 to 2015, indexed in Pubmed, Scielo, Lilacs, and Medline databases in English and Portuguese. The search strategy included the keywords: Alberta Infant Motor Scale, prematurity, preterm, motor development, postural control, and follow-up.

Data summary: A total of 101 articles were identified and 23 were selected, according to the inclusion criteria. The ages of the children assessed in the studies varied, including the first 6 months up to 15 or 18 months of corrected age. The percentage variation in motor delay was identified in the motor outcome descriptions of ten studies, ranging from 4% to 53%, depending on the age when the infant was assessed. The studies show significant differences in the motor development of preterm and full-term infants, with a description of lower gross scores in the AIMS results of preterm infants.

Conclusions: It is essential that the follow-up services of at-risk infants have assessment strategies and monitoring of gross motor development of preterm infants; AIMS is an assessment tool indicated to identify atypical motor development in this population.

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PALAVRAS-CHAVE

Prematuridade;
Desenvolvimento infantil;
Desenvolvimento motor

Desenvolvimento motor de prematuros avaliados pela Alberta Infant Motor Scale: artigo de revisão sistemática

Resumo

Objetivo: Recém-nascidos prematuros são considerados de risco para déficits no desenvolvimento motor, ocasionando a necessidade de acompanhamento nos primeiros anos de vida.

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O objetivo do presente estudo é revisar de forma sistemática as publicações que abordam o desenvolvimento motor amplo de crianças nascidas prematuras, avaliadas por meio da Alberta Infant Motor Scale (AIMS), de modo à apontar os principais desfechos motores.

Fontes dos dados: Revisão sistemática das publicações do período de 2006 a 2015, indexadas nas bases de dados Pubmed, Scielo, Lilacs e Medline, nos idiomas inglês e português. A estratégia de busca incluiu palavras-chaves: prematuro, pré-termo, prematuridade, desenvolvimento motor, controle postural, seguimento, Alberta Infant Motor Scale, prematurity, pre-term, motor development, postural control and follow-up.

Síntese dos dados: Foram identificados 101 artigos e selecionados 23, conforme critérios de inclusão. As idades das crianças avaliadas nos estudos incluíram os primeiros 6 meses até os 15 ou 18 meses de idade corrigida. Variado percentual de atraso motor foi identificado na descrição dos desfechos motores de 10 estudos, indo de 4 a 53%, dependendo da idade em que o bebê foi avaliado. Os estudos apontam diferenças significativas no desenvolvimento motor de prematuros e crianças nascidas a termo, com descrição de escores brutos mais baixos nos resultados da AIMS de crianças prematuras.

Conclusões: É fundamental que os serviços de follow-up de bebês de risco apresentem estratégias de avaliação e acompanhamento do desenvolvimento motor amplo de prematuros, sendo a AIMS uma ferramenta de avaliação indicada para identificar comportamentos motores atípicos nessa população.

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Introduction

Advances in clinical management, including the use of pediatric mechanical ventilators, surfactants, and prenatal corticosteroids, are factors that have greatly contributed to improve survival of preterm and at-risk babies in recent decades.¹ Although the mortality rate has dramatically improved over the past decades, preterm newborns remain vulnerable to many complications, including neurological insult and long-term growth and development deficits,² resulting in the necessity for a much stricter monitoring than in the past.³

As birth weight and gestational age decrease, and in cases where there is an association of adverse biological conditions, such as grade III and IV periventricular hemorrhage, periventricular leukomalacia, prolonged mechanical ventilation, stage III retinopathy of prematurity or bronchopulmonary dysplasia, the risk of neurodevelopmental abnormalities increases.⁴ Particularly, infants born at less than 32 weeks of gestational age and weighing less than 1500 g have a high biological risk condition for development.⁵

Although transient neurological abnormalities occur in 40–80% of cases, disappearing in the second year of life, severe and definitive neurosensory sequelae, such as visual and auditory deficiency and cerebral palsy, are detected in 4–20% of extremely low-weight preterm infants.^{5–7} Significant developmental delays are also evident in 16% of the cases,⁷ demonstrating a significant correlation between developmental delay and preterm birth.⁸

In this sense, carrying out periodic evaluations of each child's motor development (MD) progress is essential for the identification of deficits, thus facilitating referral to early intervention programs.^{3,8} Although there is no homogeneity among the several studies regarding the best method for evaluating development, the importance of early

identification, *i.e.*, within the child's first year of life, is a consensus.^{5,9} Among the assessment tools used to monitor alterations in MD and differentiate atypical motor behaviors, the Alberta Infant Motor Scale (AIMS) is highlighted as a valid and reliable tool for evaluating at-risk infants,¹⁰ demonstrating unique characteristics regarding preterm infants' quality of movement at an early age.^{11,12} In contrast with the traditional neurological examination, the scale emphasizes functional capacities and the quality of movement,¹³ offering up-to-date normative reference values.¹⁴ AIMS was validated for the Brazilian pediatric population, resulting in a Brazilian Portuguese version,¹⁵ and new standards were established to best represent this.¹⁶ It has high sensitivity, specificity, and accuracy to detect motor deficits, being indicated in the follow-up of preterm children's MD in the first 18 months of life.¹⁷

No systematic reviews that addressed MD outcomes in preterm infants evaluated by AIMS, establishing a comparative analysis with children born at term, were retrieved. Considering the importance of the diagnosis and early intervention of abnormalities for the development of this at-risk population, this article aimed to systematically review the publications that address the gross motor development of premature infants, evaluated through AIMS, to identify the main motor outcomes in relation to children born at term, aged 0–18 months of corrected age (CoA).

Method

Source of data

A systematic review of articles published in the last 10 years and available in the following databases: US National Library

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