



ORIGINAL ARTICLE

Preterm children have unfavorable motor, cognitive, and functional performance when compared to term children of preschool age^{☆,☆☆}



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KEYWORDS

Prematurity;
Child development;
Motor coordination;
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Functional performance;
Socioeconomic level

Abstract

Objective: to compare the motor coordination, cognitive, and functional development of preterm and term children at the age of 4 years.

Methods: this was a cross-sectional study of 124 four-year-old children, distributed in two different groups, according to gestational age and birth weight, paired by gender, age, and socioeconomic level. All children were evaluated by the Movement Assessment Battery for Children – second edition (MABC-2), the Pediatric Evaluation of Disability Inventory (PEDI), and the Columbia Mental Maturity Scale (CMMS).

Results: preterm children had worse performance in all tests, and 29.1% of the preterm and 6.5% of term groups had scores on the MABC-2 indicative of motor coordination disorder ($p=0.002$). In the CMMS ($p=0.034$), the median of the standardized score for the preterm group was 99.0 (± 13.75) and 103.0 (± 12.25) for the term group; on the PEDI, preterm children showed more limited skill repertoire ($p=0.001$) and required more assistance from the caregiver ($p=0.010$) than term children.

Conclusion: this study reinforced the evidence that preterm children from different socioeconomic backgrounds are more likely to have motor, cognitive, and functional development impairment, detectable before school age, than their term peers.

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PALAVRAS-CHAVE

Prematuridade;
Desenvolvimento infantil;
Coordenação motora;
Cognição;
Desempenho funcional;
Nível socioeconômico

Crianças pré-termo apresentam desempenho motor, cognitivo e funcional desfavorável em relação a neonatos a termo em idade pré-escolar

Resumo

Objetivo: comparar o desenvolvimento da coordenação motora, o desenvolvimento cognitivo e o desempenho funcional de crianças nascidas pré-termo e a termo, aos quatro anos de idade. **Métodos:** estudo transversal com 124 crianças de quatro anos de idade, distribuídas em dois grupos distintos, de acordo com a idade gestacional e peso ao nascimento, pareadas com relação ao sexo, idade e nível socioeconômico. Todas as crianças foram avaliadas pelos testes Movement Assessment Battery for Children – Second Edition (MABC-2), Inventário de Avaliação Pediátrica de Incapacidade (PEDI) e Escala de Maturidade Mental Colúmbia (EMMC).

Resultados: as crianças pré-termo tiveram pior desempenho em todos os testes, sendo que 29,1% das crianças do grupo pré-termo e 6,5% do grupo a termo apresentaram pontuação no MABC-2 indicativa de sinais de transtorno da coordenação motora ($p=0,002$). No Columbia ($p=0,034$), a mediana do resultado padronizado para o grupo pré-termo foi de 99,0 ($\pm 13,75$), e do grupo a termo foi 103,0 ($\pm 12,25$); no PEDI, crianças pré-termo tiveram menor repertório de habilidades ($p=0,001$) e necessitaram de maior assistência do cuidador ($p=0,010$) do que as crianças a termo.

Conclusão: este estudo reforça as evidências de que crianças pré-termo, de diferentes níveis socioeconômicos, são mais propensas a apresentarem alterações no desenvolvimento motor, cognitivo e funcional, detectáveis antes da idade escolar, que seus pares nascidos a termo.

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Introduction

The increased rates of preterm births in Brazil in recent years¹ has made it important to predict the outcome of these children, not only due to the increased mortality risk, but also because gestational age and birth weight are important indicators of biological risk for developmental delay.¹⁻⁵ Longitudinal studies have demonstrated that approximately 15% of preterm infants with very low birth weight are at risk for severe neurodevelopmental dysfunctions⁵⁻⁹ and, in the absence of major disorders, 30% to 50% of them have subtle motor, cognitive, and behavioral difficulties,^{5-7,10,11} which can be detected in preschoolers.^{6,12-15} Many of these children attend regular schools, but experience difficulties in learning and performing activities of daily living, and show poor academic performance.^{3,6,8,10,12,13}

Although long-term developmental changes in preterm children are well described in the literature, the emergence of these difficulties at preschool age is less well documented. It is important to investigate the development at preschool age, considering that an assessment focused on motor coordination, cognitive development, and functional performance at early ages could identify preterm infants at risk for developmental disorders, enabling early intervention and allowing parents to be alerted regarding the potential difficulties their children might experience, prior to the start of elementary school.

The aim of this study was to compare the development of motor coordination, cognitive development, and functional performance in preterm and full-term children at 4 years of age. The hypothesis investigated was that at this age, considering the same social level, children born preterm who are apparently normal have significantly lower motor,

cognitive, and functional performance than their full-term peers.

Methods

This cross-sectional, observational study was conducted from June of 2010 to August of 2011, with a convenience sample recruited from patients of the Follow up Clinic for Children at Risk Children (Ambulatório de Acompanhamento a Criança de Risco – ACRIAR), from two private practices as well as from four public and five private schools in Belo Horizonte, state of Minas Gerais.

The study included children aged from 4 years to 4 years and 11 months, divided into two distinct groups according to gestational age and birth weight, matched for gender, age, and socioeconomic status. For sample size calculation, analysis of variance (ANOVA) for two groups was used, assuming the same number of observations per group. For a significance level of 5% and 80% power, a minimum of 45 children per group was estimated, with a total of 90 children. The preterm group (PT) included 62 children with gestational age ≤ 34 weeks and birth weight $\leq 1,500$ g, and the full-term group (FT) group included 62 children with gestational age ≥ 37 weeks and birth weight $\geq 2,500$ g. Each group had an equal number (31) of males and females. The PT group was recruited in the follow-up clinic, schools, and private practices, and the FT group was recruited from public and private schools.

Both groups consisted of apparently normal children with no evidence of diagnoses such as cerebral palsy, intellectual disability, genetic disorders, and malformations. In the PT group, three had grade III peri-intraventricular hemorrhage (PIVH), with no motor sequelae. Children in the FT group had

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