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ORIGINAL ARTICLE

Nutritional evaluation of children with chronic cholestatic disease☆

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KEYWORDS
Neonatal cholestasis;
Nutrition;
Chronic liver disease;
Anthropometry

Abstract
Objective: To evaluate the nutritional status of children with persistent cholestasis and to compare the anthropometric indices between children with and without liver cirrhosis and children with and without jaundice.
Methods: Children with persistent cholestasis, *i.e.* increased direct bilirrubin or changes in the canalicular enzyme gamma-glutamyl transferase (GGT), were included. The anthropometric measures were weight (W), height or length (H), arm circumference (AC), triceps skinfold thickness (TST), arm muscle circumference (AMC), and body mass index (BMI).
Results: Ninety-one children with cholestasis, with current median age of 12 months, were evaluated. W/age (A) and H/A indices below −2 Z-scores were observed in 33% and 30.8% of patients, respectively. Concerning the W/H index and BMI, only 12% and 16% of patients, respectively, were below −2 Z-scores. Regarding AC, 43.8% of 89 evaluated patients had some depletion. Observing the TST, 64% of patients had depletion, and 71.1% of the 45 evaluated patients had some degree of depletion regarding the ACM index.

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Conclusion: Evaluation using weight in patients with chronic liver diseases may overestimate the nutritional status due to visceromegaly, subclinical edema, or ascites. Indices that correlate weight and height, such as W/H and BMI, may also not show depletion because of the chronic condition in which there are depletion of both weight and height. TST, AC, and ACM are parameters that better estimate nutritional status and should be part of the management of patients with liver diseases and cholestasis.

PALAVRAS-CHAVE
Colestase neonatal;
Nutrição;
Doença hepática crônica;
Antropometria

Avaliação nutricional de crianças com colestase crônica

Resumo
Objetivo: Avaliar a situação nutricional de crianças com colestase persistente e comparar os índices antropométricos entre crianças com e sem cirrose hepática e crianças com e sem icterícia.
Métodos: Foram incluídas crianças com colestase persistente, ou seja, aumento da bilirrubina direta ou alterações na enzima canalicular, gamaglutamiltransferase (GGT). As medidas antropométricas foram peso (P), estatura ou altura (A), circunferência do braço (CB), espessura da prega cutânea do tríceps (TST), circunferência muscular do braço (CMB) e índice de massa corporal (IMC).
Resultados: Foram avaliadas noventa e uma crianças com colestase, com idade média de 12 meses. 33% e 30,8% dos pacientes apresentaram índices P/I e A/I com escore Z abaixo de -2, respectivamente. Com relação ao índice P/A e IMC, somente 12% e 16% dos pacientes, respectivamente, apresentaram escore Z abaixo de -2. Com relação à CB, 43,8% de 89 pacientes avaliados apresentaram alguma depleção. Observando a TST, 64% dos pacientes apresentaram depleção, e 71,1% dos 45 pacientes avaliados apresentaram algum grau de depleção com relação ao índice de CMB.
Conclusão: A avaliação do peso em pacientes com doenças hepáticas crônicas poderá superestimar a situação nutricional devido a visceromegalia, edema subclínico ou ascite. Os índices que correlacionam peso e altura, como P/A e IMC, também podem não mostrar depleção devido à doença crônica em que há depleção tanto do peso quanto da altura. A TST, BC e CMB são parâmetros que estimam melhor a situação nutricional e devem fazer parte do manejo de pacientes com doenças hepáticas e colestase.

Introduction

Cholestasis is a common manifestation of liver disease in children, which occurs in approximately 65% of these patients. It is the impairment of bile flow due to biliary tract obstruction or impairment of bile acid uptake, conjugation, or excretion.[1,2] Cholestasis impairs the nutritional status of these children.[3] Malnutrition leads to increased morbidity and mortality in patients with chronic liver disease. Barches et al.[4] reported that malnutrition in the pre-transplant period is associated with longer hospital stay and spending. Besides, Moukarzel et al.[5] showed a narrow correlation between nutritional status and outcomes of liver transplant in children. In that study, children with *Z*-score below −2 standard deviations had a higher incidence of infection in the post-transplant period, more surgical complications, and higher mortality.

Approximately 60% of children with chronic liver disease are under the expected weight and height for their age.[6,7] An appropriate nutritional support could prevent the fast progression of the underlying disease, with improvement of the immune function.[6,8,9] Nutritional evaluation of these children is essential, but the weight can be overestimated in cases of visceromegaly, ascites, and peripheral edema; therefore, when considered separately, this evaluation is not a good parameter to identify malnutrition. The most sensitive measures to determine the nutritional status in chronic liver disease are arm circumference (AC) and triceps skinfold (TST).[10] A meticulous physical exam, several physical anthropometric measures, and individualized complementary tests are indispensable. Because malnutrition is a consequence of chronic cholestasis, knowledge on the impact of this condition in committed children may help in recommending early nutritional intervention.

This study aimed to evaluate the nutritional status of children diagnosed with cholestasis followed at the Pediatric Hepatology Unit of this institution and to correlate the food intake with nutritional status. In addition, anthropometric indices were compared between patients with and without liver cirrhosis and children with and without jaundice.

Patients and methods

This case series study was carried out at the Pediatric Hepatology Unit of the Hospital das Clínicas, Universidade Federal de Minas Gerais (UFMG), Brazil, from January of