

ABSTRACT

Programming of Macronutrient Utilization in Healthy Jamaican Children and its Influence on their Body Composition

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Objective: In a group of children measured at 11 years and 18 years of age, to determine the relationships between (1) maternal and birth factors and body composition, (2) maternal and birth factors and macronutrient utilization, (3) macronutrient utilization and body composition.

Design and Methods: 127 healthy Jamaican children aged 9 to 12 years were recruited from a longitudinal cohort of children in a study examining the effects of pre-natal factors on the development of chronic non-communicable diseases at the Tropical Metabolism Research Unit. After an overnight fast, weight, height and bioelectrical impedance were done. Body mass index (BMI), fat mass (FM), lean body mass (LBM), percent fat mass (%FM) and percent lean body mass (%LBM) were calculated. Resting energy expenditure was measured by indirect calorimetry. Urinary urea was used to estimate protein oxidation. Fat oxidation and the proxy-P ratio were calculated.

Results: Maternal height and birth length were positively associated with child's height and LBM at 11 years and 18 years of age. Shorter birth length and higher ponderal index were positively associated with fat oxidation at 11 years of age. Protein oxidation and fat oxidation were positively associated with weight, BMI, FM and LBM at 11 years and 18 years of age.

Conclusion: Body composition in childhood and adolescence may be influenced by the intrauterine environment. Fat oxidation may be programmed. The relationship between fat oxidation and obesity in childhood and adolescence needs to be further elucidated.

Keywords: Carolyn Rose Taylor-Bryan; programming; macronutrient utilization; Jamaican; children; body composition.