

ABSTRACT

Resting Metabolic Rate and Body Composition in Stunted and Non-stunted children

Suzanne Y. Soares-Wynter

Stunting is a major problem of infants and young children in developing countries and can lead to impaired work capacity in later life. In this thesis, resting metabolic rate and body composition, determined by anthropometry and bioelectrical impedance analysis, were measured in stunted children and two groups of non-stunted children matched for age or height, and sex.

Two types of analyses were used in the determination of metabolic rate with respect to differences in body size. Firstly, the traditional method of dividing the total metabolic rate by the individuals body weight; and secondly, by applying a multiple regression model whereby the total metabolic rate was the dependent variable and sex, weight or lean body mass (LBM), and group were the independent variables.

The RMR expressed per unit weight or per unit lean body mass would confirm that stunted children have significantly higher metabolic rates than children of the same age and

sex though not as high as younger children of the same height and sex. However when adjustments were made by regression analysis for differences in body composition and size, differences in RMR among the stunted children and their taller, age-matched controls were eliminated while the younger children continued to have significantly higher RMR's. The difference in results may be as a result of the mathematical errors associated with dividing metabolic rate by body weight or kilograms LBM.

These results provide no evidence that stunted children and non-stunted children of the same age and sex have RMR's that are any different to each other after accounting for differences in size. However because the RMR of stunted children is significantly lower than that of younger children of the same size and similar body composition the results suggest that the stunting process may have resulted in a change in the activity of the LBM of the stunted children. Alternatively, the lower RMR of the stunted children compared to the non-stunted height-matched controls may be as a result of the changes in the ratio of the compartments of the LBM, namely the organ and skeletal muscle masses, that normally occur with maturity.