RESTING ENERGY EXPENDITURE MEASURED BY INDIRECT CALORIMETRY IN INFANTS AND YOUNG CHILDREN WITH CHRONIC LUNG DISEASES

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Background: There have been very few studies that have measured resting energy expenditure (REE) in infants and young children with chronic lung diseases beyond the intensive care setting. This study aimed to determine REE by indirect calorimetry and to compare measured resting energy expenditure (mREE) by indirect calorimetry with prediction equations (pREE).

Methods: Infants and young children with chronic lung diseases from King Chulalongkorn Memorial Hospital were enrolled and assessed for nutritional status and severity of chronic lung disease. For mREE, indirect calorimetry was performed by a custom-made airtight canopy with O2 and CO2 sensors, with the patients in a resting state. Prediction equations were Food and Agriculture/World Health Organization/United Nations University (FAO/WHO/UNU), Schofield-Weight, Schofield-Weight/Height, Harris Benedict and Harris Benedict-Infant equations. Agreement between mREE and pREE was assessed by Bland-Altman method.

Results: A total of 18 patients (median age 6 months; range 1-26 months) were recruited. 16 children had weight for age Z-score below –2SD. Median weight for age Z-score, length for age Z-score and weight for length Z-score were -3.0, -3.1 and -1.9, respectively. Median mREE was 53.8 kcal/kg/day (interquartile range 47.5-72.6 kcal/kg/day). The Schofield – Weight/Height equation showed the lowest mean of difference at 0.94 kcal/kg/day with 95% confidence interval for bias -44.4 to 46.3 kcal/kg/day.

Conclusion: To ensure optimal nutritional support, REE should be measured by indirect calorimetry in pediatric patients with chronic lung diseases. Based on our finding, the Schofield-Weight/Height equation was the most accurate equation for predicting resting energy expenditure in this group of patients.

Keywords: RESTING ENERGY EXPENDITURE, INDIRECT CALORIMETRY, CHRONIC LUNG DISEASES, PREDICTION EQUATION, SCHOFIELD-WEIGHT/HEIGHT