Resting energy expenditure and nutritional status pre and post lung transplantation

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Elevated resting energy expenditure (REE) is observed in patients with cystic fibrosis (CF) awaiting lung transplantation. Our own results confirm this; REE was 133±12% of predicted in 15 patients (mean age 13±2.9, 10 females) awaiting lung transplant. In order to determine if there was any change in energy requirements post lung transplant, REE was measured using Indirect Calorimetry (IC) in patients with CF pre and post lung transplant. IC was performed in 7 patients (5 males) with CF before and after lung transplant (mean age 12.0±3.2, range 7.1–16.2 years). Nutritional status was defined by percent ideal body weight (%IBW). Six of the 7 patients received gastrostomy tube feeding nightly for nutritional support, pre transplant. REE was 141±9% (range 129–159%) pre lung transplant and 121±14% (range 104–145%) post transplant, which was significantly different, p<0.002 (paired t-test). The mean decline in REE was 20±10% (range 4–32%). IC was performed 10.1±8.5 months pre and 5.7±6.9 months post transplant. The mean % IBW was 93.7±1.7% and 92.1±9.6% pre and post transplant, respectively.

Summary and Conclusions: In patients with CF, REE was elevated pre lung transplant and remained elevated post transplant, however REE declined in all cases, parenteral nutrition post transplant may be required until enteral tolerance is achieved. We recommend leaving enteral tube feedings in place at least 6 months post transplant as energy requirements appear to remain elevated, at least in this small group of pediatric patients with CF.

Validity of the Tanita TBF-300M body composition analyser in children with cystic fibrosis

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Objective: The purpose of this study was to validate the Tanita body composition analyser, a non-invasive technique for measuring body composition in children with CF.

Design: We compared estimates of body fat percentage (BF%) measured with the Tanita analyser (Tanita TBF-300M) with BF% measured by air displacement plethysmography (ADP, Bodpod, LifeMeasurements Inc), the best available reference method for this population, validated in children against hydrostatic weighing in our laboratory at Wageningen University.

Subjects: Measurements were performed in 36 patients with CF during their visit at our outpatient clinic (15 boys, 21 girls, aged 7–17y, BMI range 13.72±2.5).

Results: BF% measured in the Bodpod ranged from 6.4–34.5% with a mean of 17.4%. BF% measured with the Tanita ranged from 2.9–27.0% with a mean of 15.9%. Bland-Altman analysis showed that Tanita values of BF% were on average 1.5% lower than Bodpod values (95% limits of agreement =–14.3 to 11.3%, p for difference 0.170). The difference between the two methods was independent of the magnitude of BF% (r = −0.052, p = 0.764).

Conclusion: For groups, the Tanita body composition analyser can be used to estimate body fat percentage in children and adolescents with CF because the mean difference with the Bodpod was small and not significant. However, for individual patients data should be used with caution.

The value of a non-invasive method to assess fat free mass in adult CF patients – correlation with outcome measures in a cohort of adult CF patients

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Background: Bioelectrical impedance analysis (BIA) is a rapid, portable, non-invasive method of estimating body composition. Fat Free Mass (FFM) can be calculated from BIA values. The relationship between FFM and recognised outcome measures in a cohort of adult CF patients was investigated.

Patients and Methods: A total of 44 adult CF patients (17 female) mean age 25.8 years, range 18–41 years were assessed. BIA was performed using whole body impedance with the Bodysat 1500, (Bodystat Ltd). FFM was calculated using the manufacturer’s software. Outcome measures investigated were: FEV1, body mass index (BMI), modified performance score and number of annual pulmonary exacerbations.

Results: FFM values did not correlate with age, but were significantly greater in male than in female patients; mean FFM (SEM) 82.6 (1.0) for male vs. 72.55 (1.3) for female; P<0.001. There was a weak correlation between FFM and BMI in male (r=0.39, P<0.05) and for female (r=0.45) although the latter did not reach statistical significance (P = 0.07). There was no correlation between FFM and number of annual pulmonary exacerbations, FEV1 or with modified performance score.

Conclusion: In this cohort of adult CF patients FFM correlated with BMI in male patients but not in female patients. It did not correlate with any other recognised outcome measure. We question the added value of this method to the routine evaluation of CF patients.

Hand grip strength values correlate with recognised outcome measures in a cohort of adult CF patients

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Background: Hand grip strength (HGS) is a method used to assess the function of peripheral muscle. Its values are indicative of global muscle power and nutritional state. Correlation between HGS and recognised outcome measures in adult CF patients has not previously been investigated.

Patients and methods: HGS was measured in 41 CF patients (14 female), mean age 24 years, range 18–41 years. Their mean (SD) FEV1 was 69 (26.7) percent of predicted values. HGS was measured using a hand grip dynamometer (GRIP- DTOK 5101; Takei). Reduced HGS was determined to be <85% of normal, for age and gender, (Goode et al. and Klidjian et al.). Fat free mass (FFM) was estimated using bioelectrical impedance analysis. Outcome measures used for correlations were; body mass index (BMI), FEV1, number of pulmonary exacerbation within the previous year and modified performance score.

Results: Percentage of predicted FEV1 was significantly lower in patients with reduced HGS; mean ± (SEM) was 53.00±(6.9), compared to patients with normal values; 76.4±(5.07), P=0.01. Similarly the number of annual pulmonary exacerbations were greater, 2.8±(0.69) in those with reduced HGS compared to those with normal values 2.3±(0.46). The modified global performance score was significantly lower when HGS was reduced than when values were normal, 14±1.0 (for reduced), 16.8±0.5 (for normal), P=0.02. The values of HGS correlated with percentage of FFM (r = −0.44, P = 0.005) and with BMI (r = 0.43, P < 0.007).

Conclusion: Hand grip strength is a simple method that correlates with recognised outcome measures in adult CF patients. It can be used in the evaluation of nutritional status.