

Optimal estimation of energy requirements in adults with mitochondrial disease

Joanne Boes, Marlou van Hal, Susanne Leij, Mirian Janssen, Geert Wanten & Heidi Zweers

Introduction

Although an accurate prediction of total energy expenditure (TEE) in patients with mitochondrial disease (MD) is crucial to guide individual dietary treatment, data on energy requirements in this patient group are lacking. Our aim was to find the optimal method to estimate TEE in MD patients.



Methods

- After an overnight fast, resting energy expenditure (REE) was measured in MD patients (carrying the m3243A>G mutation) using indirect calorimetry.
- REE was compared with 21 predictive equations.
- Physical activity level (PAL) was measured using actometry (Sensewear®).
- Estimated PAL was based on patients self estimated activity level.
- Accuracy of estimations methods were evaluated as percentage of subjects within $\pm 10\%$ of measured values, the root mean squared error (RMSE) and mean absolute percentage difference (bias).

Conclusion

- In MD patients the Henry equation based on weight and height is the most reliable alternative for IC to predict REE although there are small differences between predictive equations.
- REE predictive equations with FFM do not predict REE more accurate.
- As PAL is not reliably estimated by patients, measurement of PAL using actometry is recommended in MD patients.

Results

Thirty-eight MD patients (age: 48 yr ± 13 , mean \pm SD; male n=5) signed informed consent.

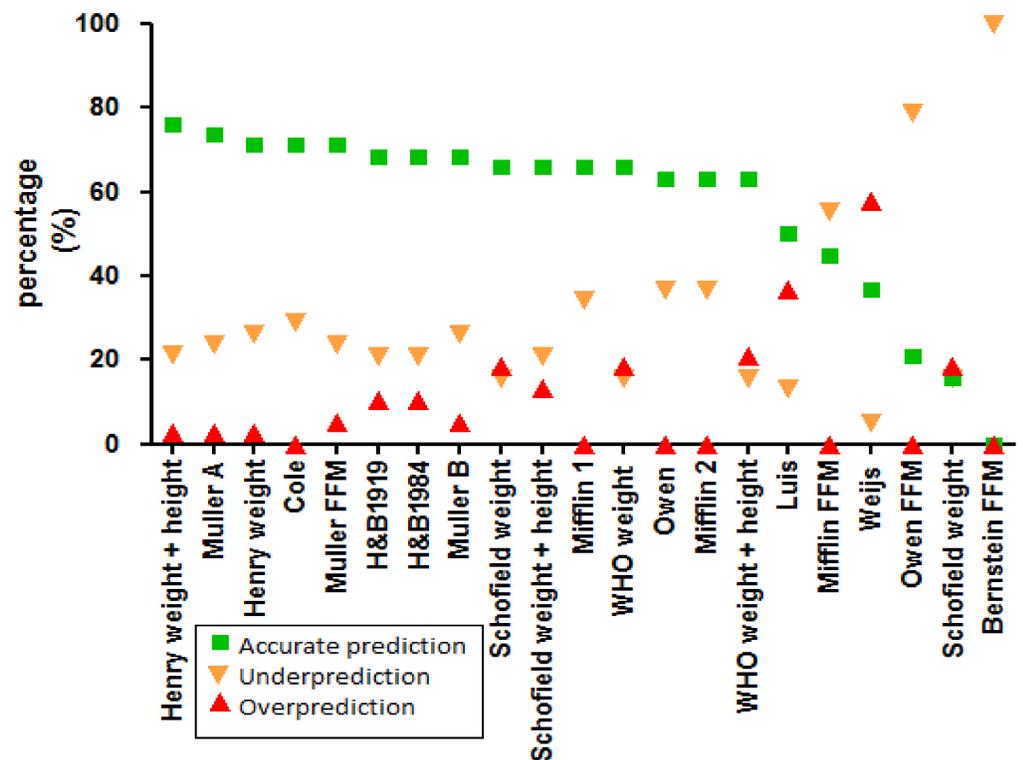


Figure 1. Accurate predictions REE

Estimation method	Accurate predictions (%)	RMSE	Bias (%)
Physical Activity Level (PAL)			
Lowest self predicted PAL	34	0,29 PAL / day	18
Highest self predicted PAL	18	0,38 PAL / day	24
Average measured PAL	53	0,24 PAL / day	13

Table 1. Accurate predictions, RMSE and bias PAL

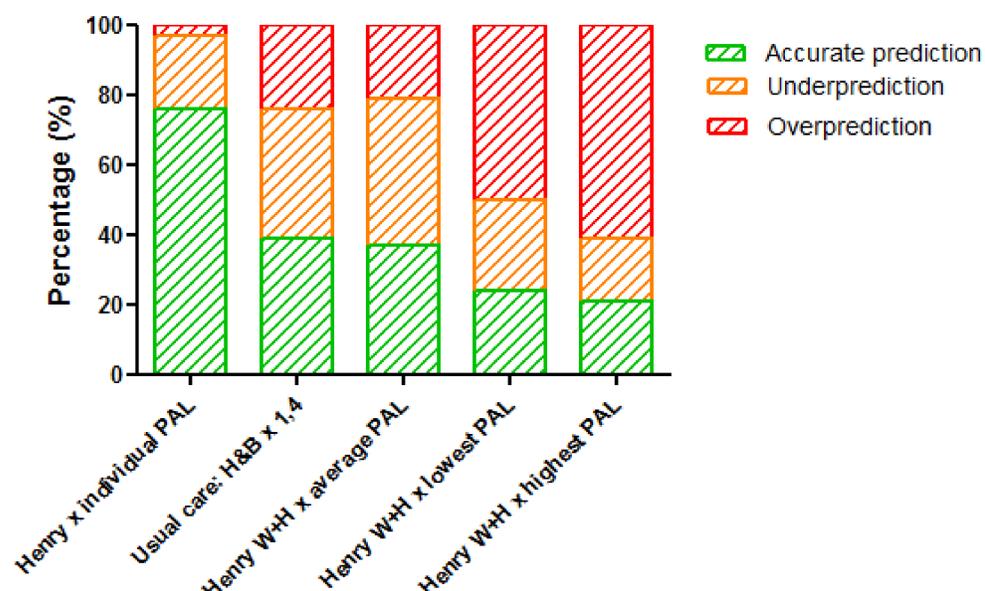


Figure 2. Estimation methods TEE