

ABSTRACT

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Title: Effect of supplementation on the utilization of nutritional substrates in pregnant woman

Background

The aim of this thesis was to determine and analyse changes in resting energy expenditure and substrate utilization in pregnant woman at different stages of pregnancy. Another goal of the thesis was to find an association between substrate utilization and the intake of vitamins and minerals from supplements and food.

Methods

The study involved 16 first-time mothers (31 ± 3 years old), who were examined between the 17th-27th, 28th-35th and 36th-37th weeks of pregnancy. Resting energy expenditure and utilization of nutritional substrates were determined using indirect calorimetry and urea excretion from 24-hour urine collection. The intake of micronutrients from food and supplementation was assessed using weekly nutritional records and nutritional software Nutridan.

Results

Resting energy expenditure increased by approximately 20 % between the second and the end of the third trimester ($p = 0.0062$). It remained significantly higher even when adjusted for the percentage of predicted value ($p = 0.0124$), body surface area ($p = 0.0096$), fat free mass ($p = 0.0402$). Although the substrate utilization did not change significantly during pregnancy, an association with the intake of various micronutrients was demonstrated. A positive association was particularly observed between the intake of vitamins and minerals and the utilization of carbohydrates. Conversely, negative associations were found with the utilization of lipids. The correlation between supplementation and protein utilization was both negative and positive.

Conclusions

While substrate utilization remained relatively constant across different stages of pregnancy, an association with the intake of vitamins and minerals from both diet and supplements was demonstrated. Our study revealed a trend suggesting that micronutrient intake may have a potentially significant impact on substrate utilization.

Keywords: pregnancy, indirect calorimetry, respiratory quotient, resting energy expenditure, substrate utilization, supplementation