ABSTRACT

Charles University, Faculty of Pharmacy in Hradec Králové

Department of Biological and Medical Sciences

Student: Monika Danielisová

Supervisor: PharmDr. Miroslav Kovařík, Ph. D.

Title of master thesis: The association of energy intake and parameters of energy metabolism in pregnant and lactating women

Background: The objective of this study was to compare changes in metabolism during pregnancy and lactation and evaluate the relationship between energy intake (as well as macronutrients intake – saccharides, lipides and proteins) and parameters of energy metabolism.

Methods: Method of indirect calorimetry was used to assess the parameters of energy metabolism. In order to evaluate protein oxidation, it was necessary to establish the amount of waste nitrogen, which was measured from 24-hour collection of urine. Energy and macronutrients intake were calculated in NutriDan software based on data from 7 days questionary.

Results: Most significant differences in measured volume of oxygen consumption and carbon dioxide production were observed between the period of 3rd and 6th month after delivery and in all 3 measurements throughout pregnancy. The average of predicted resting energy expenditure at the end of pregnancy was 1596 ± 146 kcal/day, which increase to 106 ± 9 %. This declined after 6th month postpartum to 94 ± 6% and after further stabilized 9 months after delivery. Differences in carbohydrate and protein oxidation were not observed, however there were differences in lipid oxidation, which were most significant between the period of 3th and 6th month after delivery and 36th and 39th week of pregnancy. Most of associations between parameters of energy metabolism and intake of macronutrients were observed in lactating women (the most common association being related to protein intake).

In pregnancy the main association found was related to saccharide intake at the end of the third trimester.

Conclusion: There are significant antopometric changes as well as calorimetric changes taking place after delivery. Significant differences were observed mostly between the period of 1st and 6th month after delivery and the period of pregnancy. Study showed the influence of the food intake on the parameters of energy metabolism of pregnant and lactating women. These results can be used to improve individual assessment and for nutritional counseling in these periods.

Keywords: energy metabolism, indirect calorimetry, energy intake, resting energy expenditure, substrate oxidation, pregnant woman, lactating woman