

Abstract

Background: Total daily energy expenditure of Czech women in particular trimesters of pregnancy is a lowly explored part of energy metabolism.

Objective: The purpose of our study was to estimate total daily energy expenditure and basal metabolic rate in particular trimesters of pregnant women in the Czech Republic and to compare our values with these presented in foreign literature.

Design: The study was based on 409 assessments. The base was created by questionnaires where women described all of their activities of a certain day. Women also gave details of an exact time of duration for each activity. For mathematical assessments there were used a specially designed program Energy expenditure 2 and a statistic program GraphPad Prism 4. As the value of basal metabolic rate were considered values obtained according to Harris-Benedict equation and consequently modified by multiplication factors (1,035 for the first trimester, 1,062 for the second trimester and 1,177 for the third trimester). These factors were obtained from clinical assessment of basal metabolic rate in Teaching hospital in Hradec Králové. The same factors were used for estimating of total daily energy expenditure. In our study there are described also other energy characteristics – activity energy expenditure, physical activity ratio. Our study observed also the relationship of energy expenditure and BMI and body surface area.

Results: The average values of basal metabolic rate in our study was 1678 ± 163 kcal/day. There was seen a gradual increase in these values during pregnancy. This increase was gained also in relation to BMI of women. In our study there was value of daily energy expenditure 3085 ± 569 kcal/day on average. In the first trimester (till the 13th week of pregnancy) it was 2352 ± 385 kcal/day on average, in the second trimester (from the 14th to the 26th week of pregnancy) 2834 ± 427 kcal/day and in the third trimester (from the 26th week of pregnancy) it was 3360 ± 569 kcal/day. Our study acknowledged world trend of increase in total daily energy expenditure during pregnancy. Activity energy expenditure showed opposite trend than which is presented in foreign literature – in our study the activity energy expenditure is rising during pregnancy. The average value of AEE during the whole pregnancy was 1408 ± 433 kcal/day.

Conclusion: Our study acknowledged the gradual increase in values of basal metabolic rate and total daily energy expenditure in particular trimesters of pregnancy. Our study used multiplication factors which are given for certain trimesters. Our study doesn't acknowledge the general trend of reduction in activity during pregnancy, Czech women stay physical active even in high level of pregnancy. Ireton-Jones equation is not suitable for estimation of daily energy expenditure of pregnant women, this results from our study. The

conclusion of our study is also the equation for assessment of total daily energy expenditure during pregnancy: $TEE = 0,972 \times IJ + 958,44$, where TEE means total daily energy expenditure of pregnant woman and IJ means the value of Ireton-Jones equation. However, it is necessary to examine this equation in another group of women for following use in clinical practice.