

CHANGES IN ENERGY METABOLISM FROM PREPREGNANCY TO POSTPARTUM:

A Case Report



BACKGROUND

The estimation of energy needs during pregnancy and lactation is challenging. Current recommendations for energy may not reflect the needs of contemporary women who are generally older, more sedentary, and of different body composition compared with data from older studies. This in turn can impact weight gain/retention throughout pregnancy and postpartum.

THE PARTICIPANT

The married, university educated, Caucasian participant was 30 years of age, and working full time prior to maternity leave. Her prepregnancy weight and height were 58.06 kg and 1.64 m, respectively. Resting blood pressure and heart rate were within normal ranges with no adverse health problems.

THE STUDY

- Differences in energy metabolism of a primigravid woman (age: 30 years) were explored at 1 month pre-pregnancy (“baseline”), during pregnancy (33 weeks), and at 3 and 9 months postpartum.
- Energy metabolism was measured using a whole body calorimetry unit.
- Body composition was measured using dual-energy X-ray absorptiometry.
- Energy intake was measured using 3-day food records.
- Physical activity was measured using the Baecke questionnaire.
- Breast milk volume/breastmilk energy output was measured using a 24-h infant test weighing protocol.
- Measured versus estimated energy expenditure was compared using equations commonly used in clinical practice.

FINDINGS

TOTAL ENERGY EXPENDITURE (TEE)

- During pregnancy, measured TEE was 95 kcal lower than predicted by the Dietary Reference Intakes (DRIs).
- At 9 months postpartum, DRIs overestimated measured TEE by 350 kcal.
- TEE returned to prepregnancy values by 9 months postpartum despite additional costs of breastfeeding.

RESTING ENERGY EXPENDITURE (REE)

- Measured REE was higher than estimated at all 4 time-points.
- REE was 75% of TEE throughout pregnancy and the postpartum period even with the significant burden of energy deposition (during pregnancy) and energy stores mobilization (during lactation).

ENERGY INTAKE AND PHYSICAL ACTIVITY

- Energy intake was similar between both postpartum periods (3 months and 9 months) and physical activity increased in the postpartum period compared with pregnancy, remaining stable postpartum.

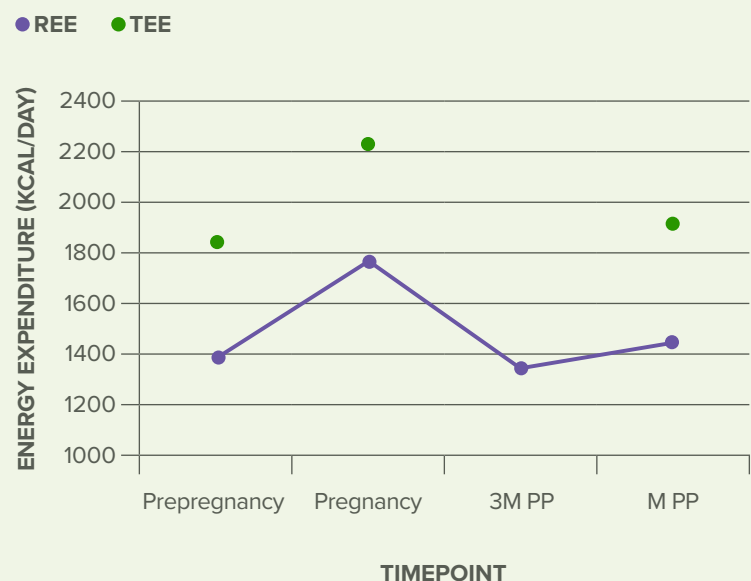
BODY COMPOSITION

- Body weight returned to prepregnancy values at 9 months postpartum, but waist circumference was higher compared with prepregnancy.
- No change in lean tissue occurred during the postpartum period although fat mass was increased by 2% between 3 and 9 months postpartum without changes in physical activity and energy intake.

FIGURE 1.

Changes over time in resting and total energy expenditure measured using the whole body calorimetry unit.

REE: resting energy expenditure
TEE: total energy expenditure
3M PP: 3 months postpartum
9M PP: 9 months postpartum



CONCLUSION

Pregnancy and postpartum energy needs may not be accurately depicted by current equations. Likewise, weight change is not reflective of body composition change. Accurately determining energy needs during these periods is essential for providing adequate dietary advice and promoting a healthy body weight and composition, avoiding any adverse maternal/infant outcomes. Further research is required to re-evaluate and revise current energy recommendations for pregnant and postpartum women.

Pereira, L. C. R., Elliot, S. A., McCargar, L. J., Bell, R. C., Prado, C. M. (2018). Changes in Energy Metabolism from Prepregnancy to Postpartum: A Case Report. *Can J Diet Pract Res*, 79:191-195.



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