

Reviewer's report

Title: Lower energy expenditures in infants from obese biological mothers

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Reviewer: James DeLany

Reviewer's report:

The authors have used a sophisticated whole body calorimeter to measure energy expenditure in infants born to lean, overweight and obese mothers over a 4 hour period. The authors have shown that extrapolated 24-h EE of infants from obese and overweight mothers was lower than that observed in infants from lean mothers. While this is a novel finding, and somewhat different from a previously published study which found a lower energy expenditure in infants who became obese, there are methodological issues and problems in interpretation of the literature that need to be resolved.

- Major Compulsory Revisions

1. The authors have used a sophisticated whole body calorimeter to measure energy expenditure in infants born to lean, overweight and obese mothers over a 4 hour period. However, they have extrapolated these values to 24 hr measures. While the authors have data showing that in a small group of infants the extrapolated values are similar to values obtained over 24 hours, this may not be the case for individual infants, particularly infants that may be metabolically different from each other, as is the case in this report. One indication of a problem with the extrapolation is that the extrapolated sleeping metabolic rate is higher than the extrapolated resting metabolic rate, both as shown in this paper in Table 3, as well as reported in the "validation" study. A more appropriate presentation of the data would be to present the data actually measured in this study, i.e. 4 hr data, both uncorrected and corrected. A breakdown of the time spent and energy expended during sleeping, at rest and active in each group would also be helpful. It is unclear to this reviewer how the authors determined resting metabolic rate, as the infants appear to have been in a postprandial condition, as substantial intake is reported in Table 3.

2. Page 4, first full paragraph: The authors discuss problems with previous studies that produced inconsistent results. It is unclear to this reviewer that the indirect calorimetry techniques used previously were inappropriate. While the authors' whole body calorimeter provides information that can not be obtained from a technique such as DLW, a head to head comparison does not prove an automatic advantage to the authors' chamber. For example, in this study energy expenditure was measured for only 4 hours, while DLW provides integrated energy expenditure over several days.

3. The authors has misrepresented 2 of 3 references in both the introduction and discussion. Reference 11 shows that those infants who became overweight at 1

year had a lower energy expenditure. The interpretation of this paper is also different between the introduction and the discussion. In the discussion the authors state that this study did not observe a difference in EE in infants from lean and obese mothers, which is correct. Reference 12 does not include measures of energy expenditure by DLW, but milk intake by deuterium turnover. Perhaps the authors are referring to a previous article (1996) by these authors. Furthermore, in the discussion, the authors entirely discount their previous data due small sample size, whereas there is no indication of a difference.

4. The authors have placed too much emphasis on their $\hat{\text{FFM}}$ measures, which were actually obtained from formulas based on body weight and length. Whether these formulas are appropriate for infants in each of the groups included in this study is unclear. One indication that they may not be appropriate is that the infants born to obese mothers had a mean length for age of only 67% while those born to lean mothers were at the 87.6 percentile. Regardless of the appropriateness of the formulas, they are essentially no better than BMI, and in adults, while there is a significant correlation between BMI and measured body fat, the individual variability is very wide. Therefore, body weight would seem to be a more appropriate variable to use in this study.

5. Discussion, first sentence: This is an overreaching statement. DLW is a modern methodology that has been shown to be accurate, at least in adults. While indirect calorimetry has been shown to be quite accurate, as far as this reviewer can determine, no validation studies comparing the accuracy of the chamber used in this study to another method have been conducted. The authors should at least provide data from alcohol burns.

6. An aspect of this study which should be highlighted is the fact that this study includes, almost exclusively, infants from minority mothers. This should also be addressed in the discussion, as this could be a potential reason why the authors have observed different results from other investigators.

- Minor Essential Revisions

1. Page 3, second paragraph: $\hat{\text{FFM}}$ related to maternal BMI $\hat{\text{FFM}}$

2. Figure 1 does not appear to be necessary, as similar pictures have been previously published.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.