LETTER

Fetal/placental weight ratio in a mouse model of maternal diet-induced obesity

Lionel Carbillon[a,1]

Aye et al. recently proposed a C57BL/6J mouse model of maternal diet-induced obesity, which was associated with maternal glucose intolerance, decreased circulating levels of high molecular weight adiponectine (ADN), and fetal overgrowth, and considered it was clinically relevant in testing the hypothesis that ADN supplementation prevents the changes in placental function and fetal overgrowth associated with maternal obesity (1).

The authors compared three groups of pregnant animals: lean mice on a control diet infused with vehicle (C/PBS), obese mice infused with vehicle (OB/PBS), and obese mice with infusion of ADN (OB/ADN), and they indeed observed that ADN supplementation completely reversed or normalized excessive fetal growth, placental glucose and amino acid transport, and insulin/mechanistic target of rapamycin complex1 signaling (1).

However, the changes in fetal weight and placental function were not associated with differences in placental weight or fetal/placental weight ratio, which is usually considered as a proxy for placental efficiency. Fetal/placental weight ratio was even slightly increased in the OB/PBS group, although the difference was not significant, in contrast with the findings of Lager et al. (2), who demonstrated in the same model that fetal/placental weight ratio was lower in obese dams ($P < 0.01$), in accordance with similar findings in overweight, obese, and morbidly obese pregnant women (3).

Because lower values of fetal/placental weight ratio in pregnant women are associated with a higher rate of placental lesions (4), and with both maternal prepregnancy body mass index (3, 4) and adverse obstetric outcomes (3–5), the absence of differences in fetal/placental weight ratio between OB and control groups of Aye et al.'s (1) study could raise a serious issue about the validity of this mouse model.

1 Aye ILMH, Rosario FJ, Powell TL, Jansson T (2015) Adiponectin supplementation in pregnant mice prevents the adverse effects of maternal obesity on placental function and fetal growth. *Proc Natl Acad Sci USA* 112(41):12858–12863.

2 Lager S, et al. (2014) Diet-induced obesity in mice reduces placental efficiency and inhibits placental mTOR signaling. *Physiol Rep* 2(2): e00242.

3 Wallace JM, Horgan GW, Bhattacharya S (2012) Placental weight and efficiency in relation to maternal body mass index and the risk of pregnancy complications in women delivering singleton babies. *Placenta* 33(8):611–618.

4 Huang L, et al. (2014) Maternal prepregnancy obesity is associated with higher risk of placental pathological lesions. *Placenta* 35(8): 563–569.

5 Nohr EA, et al. (2005) Prepregnancy obesity and fetal death: A study within the Danish National Birth Cohort. *Obstet Gynecol* 106(2): 250–259.

[a]Department of Obstetrics & Gynecology, Hôpital Jean Verdier, Assistance Publique-Hôpitaux de Paris University of Paris 13, Bondy 93143, France

Author contributions: L.C. designed research, performed research, and wrote the paper.

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[1]Email: lionel.carbillon@aphp.fr.

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