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Obesity-induced hepatic and placental inflammation are absent in obese gestating mice compared to control fed dams.

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Introduction Maternal obesity is associated with increased risk of metabolic dysfunction in the offspring. It is not clear which physiological aspects of the obese state that cause this metabolic programming. Obesity causes many metabolic changes but also low grade inflammation. In this study, we have determined if increased low grade inflammation was present in obese dams compared to controls dams during gestation.

Methods Female C57BL/6 mice were fed either a standard chow diet (3% fat) or a highly palatable obesogenic diet consisting of a high fat pellet diet (20% fat) supplemented with sweetened condensed milk. After 6 weeks on the diets, half the mice (n=12) were sacrificed and the remaining half were mated and sacrificed on gestation day 18 (n=8). Blood and tissues were collected for analysis.

Results The obesogenic diet increased adiposity, adipocyte size and leptin levels both in the pre-gestating and gestating state. There was also a tendency for increased hepatic lipid accumulation in obese mice. Body weight was increased in pre-gestating obese mice, but at the end of gestation there was no change in body weight between control and obese dams. Insulin levels were higher in pre-gestating obese dams. During gestation, a marked increase in the control dams, not seen in the obese, equalized this difference. Blood glucose levels were unaffected by diet or gestation. Local inflammation was assayed by macrophage count in liver and placenta. Hepatic macrophage count was in general reduced by gestation but only obese mice showed a significantly lower macrophage count during gestation, due to an elevated count prior to gestation. Placenta macrophage count was unaffected by the diet.

Conclusion Obese dams were found not to express increased inflammation in placenta and liver compared to lean dams, despite profound hepatic inflammation before gestation. Thus, the diet-induced inflammation is not maintained during gestation.