

Extended Abstract

Elevated Chemokine C-C motif ligand 2 (CCL2) early in pregnancy is associated with increased risk of preeclampsia in obese parturients

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Background

Obesity complicates pregnancy with increasing frequency and is associated with increased antenatal complications including preeclampsia and gestational diabetes. A key question remains why some pregnancies complicated by obesity are associated with poor perinatal outcomes while others remain largely unaffected. Adipose tissue containing adipocytes and inflammatory cells contribute to systemic inflammation, hypertension and diabetes outside of pregnancy. Chemokine C-C motif ligand 2 (CCL-2), which can be produced by adipocytes and macrophages to augment inflammation in multiple organ systems, and Leptin, a small molecule produced by adipocytes involved in metabolism and inflammation, may contribute to poor

pregnancy outcomes before symptoms are clinically noted.

Objective

The objective of this study is to measure plasma CCL2 and leptin early in control and obese women and associate pregnancy outcomes with these levels. We hypothesize that early elevations of plasma CCL2 will be predictive of the development of poor pregnancy outcomes.

Study Design

This is a case control study using banked maternal plasma samples at less than 20 weeks gestation and clinical data obtained from the University

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of Iowa Tissue bank. Two cohorts are identified including those with a BMI<30 and those with a BMI>35. CCL2 and Leptin levels are determined by ELISA and normalized to total plasma protein.

Results

Obese patients with a BMI>35 had a statistically significant elevation in CCL2 to protein ratio compared to those with a BMI of less than 30 (0.341 compared to 0.230 respectively (P<0.001)). Controlling for obesity, elevated levels of CCL2:protein were significantly associated with development of preeclampsia, not gestational diabetes or Cesarean delivery. CCL2:protein ratio is moderately predictive of the development of preeclampsia (ROC AUC=0.70) While the leptin to protein ratio was significantly elevated in those

with a BMI>35 compared to those with a BMI<30. It was not associated with preeclampsia, gestational diabetes and C section after controlling for obesity.

Conclusions

Elevated levels of CCL2 early in pregnancy is associated with development of preeclampsia in the obese, suggesting that changes in obesity associated inflammation, not simply the presence of adipose tissue contributes to development of preeclampsia.

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