Gene expression of inflammatory markers and growth factors in placenta in relation to maternal obesity, and foetal and postnatal growth

av

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Akademisk avhandling

Avhandling för medicine doktorsexamen i medicinsk vetenskap, inriktning biomedicin
som kommer att försvaras offentligt
fredagen den 16 oktober 2020 kl. 09.00
Hörsal C1, X-huset Universitetssjukhuset Örebro

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Abstract


Maternal obesity is a growing health problem, that contributes to obstetrical complications in pregnancy, as well as neonatal morbidity and mortality. The placenta serves for gas and nutrient exchange between the mother and the foetus, and obesity may influence and modify placental growth and function. The aims of this thesis were to investigate associations between maternal obesity without associated morbidity and gene expression of inflammatory markers and growth factors in the placenta, as well as offspring birth weight and postnatal growth.

Study I and III were designed as matched case-control studies including 32 obese women with an early pregnancy body mass index (BMI) ≥ 35.0 kg/m², study II was an experimental study examining twelve placentas of normal weight women, and study IV was a cohort study including 109 obese women with a BMI ≥ 34.5 kg/m². In studies I-IV analyses of gene expression were performed and in study III additionally cord blood concentrations were determined.

No difference was found in the occurrence of placental gene expression of inflammatory markers or growth factors between obese and normal weight women, nor did the sampling site in placentas of normal weight women influence gene expression of these markers, except for leptin gene (LEP) and insulin receptor gene (INSR) expression. Ghrelin gene (GHRL) and LEP expression, as well as cord blood ghrelin and adiponectin levels, was not altered in maternal obesity, and a negatively U-shaped relationship between LEP expression and infant birth weight (BW) z-scores was observed in the placentas of obese women.

In conclusion, no statistically significant difference in gene expressions of inflammatory markers and growth factors in the placenta between severely obese and normal weight women was found. These results are in contrast with earlier studies and could be due to the fact that we examined mainly healthy obese women. The correlations we found between gene expression of leptin in the placenta and the birth weight of the infants warrants further studies.

Keywords: obesity, pregnancy, placenta, gene expression, cytokines.

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