Macrophages, monocytes and fetal growth restriction

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We hypothesize that higher levels of pro-inflammatory macrophages in pregnancy are related to early placental developmental defects (i.e. decreased trophoblast invasion and SA development) or inflammation and oxidative stress later in gestation,...

Ethische beoordeling	Niet van toepassing
Status	Werving nog niet gestart
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON23444

Bron
NTR

Verkorte titel
N/A

Aandoening

Fetal growth restriction

Ondersteuning

Primaire sponsor: UMCG
Overige ondersteuning: N/A

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

Differences in macrophage and monocyte numbers and phenotype in maternal blood, placenta and cord blood

Toelichting onderzoek

Achtergrond van het onderzoek

Pregnancy is an immunological challenge in which the maternal immune system must facilitate maternal-fetal tolerance, placental development and functioning, and defense for mother and child against pathogens. This study will focus on maternal macrophages and monocytes specifically. During pregnancy, maternal macrophages that reside in the decidua are involved in placental development, fetal trophoblast invasion into the uterine stroma and remodeling of the maternal placental arteries, angiogenesis and tissue remodeling. Although knowledge of the exact macrophage characteristics and functional activity throughout uncomplicated pregnancies remains largely unknown, maternal macrophages are thought to increase after fertilization and are predominantly of the M1 subset during implantation, followed by a mixed M1/M2-like pattern in the first trimester. During the remainder of pregnancy, macrophages decrease in number and mostly express an M2-like phenotype, related to the preservation of maternal-fetal tolerance. Common pregnancy complications like preeclampsia, preterm birth and recurrent pregnancy loss have earlier been associated with an increased number of inflammatory macrophages. Hypothetically, aberrant macrophage behavior is associated with impaired placental development early in FGR pregnancies, or with inflammatory or hypoxic events later on.

The primary objective is to analyze differences in macrophage and monocyte numbers and phenotype in maternal blood, placenta and cord blood between uncomplicated pregnancies and pregnancies complicated by FGR.
The secondary objective is to analyze the functional status of macrophages and monocytes in terms of cytokine secretion and response to inflammatory triggers.

This in an observational study that investigates numbers, phenotype and cytokine levels of macrophages and monocytes derived from the placenta, cord blood and maternal blood using flowcytometry, RT-PCR and Luminex. Macrophages will be isolated from the placenta and cord blood will be obtained after delivery. Monocytes will be derived from maternal blood during a routine pregnancy check-up around 30 weeks GA and during delivery. In addition, monocytes and macrophages will be stimulated with pro- and anti-inflammatory triggers. Data will be compared between uncomplicated pregnancies and pregnancies complicated by fetal growth restriction.

Doel van het onderzoek

We hypothesize that higher levels of pro-inflammatory macrophages in pregnancy are related to early placental developmental defects (i.e. decreased trophoblast invasion and SA development) or inflammation and oxidative stress later in gestation, causing or worsening PI, hypoxia and compromising fetal growth.

Onderzoeksopzet

30 weeks gestational age and peripartum

Onderzoeksproduct en/of interventie

None

Contactpersonen

Publiek

UMCG
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Wetenschappelijk

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Romy Bezemer

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

- Informed consent
- 18-40 years old
- Pregnant
- Gestational age (GA): 36-42 weeks
- Fetal growth restriction and adequate fetal growth

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

- Smoking
- BMI >30
- Immune related disorders

- Fever/illness within the last month
- Fertility treatment (ovulation induction, intra-uterine insemination (IUI), in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI))
- Major congenital abnormalities

Onderzoeksopzet

Opzet

Type:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Anders
Toewijzing:	Niet-gerandomiseerd
Blindering:	Open / niet geblindeerd
Controle:	N.v.t. / onbekend

Deelname

Nederland

Status:	Werving nog niet gestart
(Verwachte) startdatum:	01-04-2021
Aantal proefpersonen:	48
Type:	Verwachte startdatum

Voornemen beschikbaar stellen Individuele Patiënten Data (IPD)

Wordt de data na het onderzoek gedeeld: Nog niet bepaald

Ethische beoordeling

Niet van toepassing

Soort:	Niet van toepassing

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL9350
Ander register	METC UMCG : METc 2021/063

Resultaten