# Extracellular ATP, hemopexin and vascular alterations in Preeclampsia*

Published: 20-01-2009
Last updated: 06-05-2024

The present study has 2 primary objectives: 1: The first aim of the present study is to explore early detection possibilities using plasma hemopexin activity and plasma ATP levels in cohorts of pregnant women in a time course manner (experiment 1)....

| | |
|---|---|
| **Ethical review** | Approved WMO |
| **Status** | Recruitment stopped |
| **Health condition type** | Maternal complications of pregnancy |
| **Study type** | Observational invasive |

## Summary

### ID

NL-OMON37052

**Source**
ToetsingOnline

**Brief title**
Hemopexin, ATP and preeclampsia

### Condition

- Maternal complications of pregnancy
- Vascular hypertensive disorders

**Synonym**
preeclampsia

**Research involving**
Human

### Sponsors and support

**Primary sponsor:** Universitair Medisch Centrum Groningen
**Source(s) of monetary or material Support:** Nierstichting Nederland

## Intervention

**Keyword:** ATP, hemopexin, preeclampsia, vascular changes

## Outcome measures

### Primary outcome

Experiment 1: Blood samples (10 ml heparinised and 10 ml EDTA) of 135 pregnant women at high risk for developing preeclampsia will be taken at weeks 10, 14, 18, 20 and 25, 30, 35 and 40 of pregnancy. We will measure plasma hemopexin activity and plasma ATP levels as well as various inflammatory parameters.
Experiment 2: Blood samples (10 ml EDTA, 10 ml heparinised blood) will be taken from women diagnosed with preeclampsia (ISSHP criteria). We will measure activation of inflammatory cells and plasma concentrations of hemopexin, ATP, inflammatory parameters and other factors suggested to be involved in the pathogenesis of preeclampsia. In tissue biopsies we will measure endothelial cell activation and dysfunction.

### Secondary outcome

nvt

# Study description

### Background summary

Preeclampsia is the most serious complication of pregnancy in the western world. The aetiology is unknown and the pathophysiology is relatively unknown. It is generally assumed that generalized inflammation and endothelial cell activation play a prominent role in the pathogenesis of preeclampsia. More recently, various circulating factors, such as sFlt-1 and endoglin, have also been suggested to be involved in the pathogenesis of preeclampsia.
Early recognition of the disease is crucial for better obstetric care of pregnant women at risk and their unborn child. Moreover, early detection of the

disease may also lead to better insight into the pathogenesis of PE, which at the moment is largely unknown. Finally early diagnosis may facilitate the generation of novel therapeutic strategies.
We have recently shown that hemopexin activity, a heme-binding acute phase protein with protease activity, is increased during normal pregnancy, but not during preeclampsia. The decrease of hemopexin activity during preeclampsia is due to increased plasma levels of ATP, a potent inhibitor of hemopexin activity. This suggests that hemopexin activity plays a role in the normal physiology of pregnancy, and that the decreased activity in preeclampsia is involved in the pathogenesis of this disease.

### Study objective

The present study has 2 primary objectives:
1: The first aim of the present study is to explore early detection possibilities using plasma hemopexin activity and plasma ATP levels in cohorts of pregnant women in a time course manner (experiment 1).
2: The second aim of the present project is to study plasma hemopexin activity and ATP levels in the various forms of preeclampsia, early onset and late onset preeclampsia as well as severe and mild form of PE. At the same time we will investigate the relationship between plasma hemopexin and ATP with inflammatory parameters and other circulating factors, which are suggested to play a role in the pathogenesis of preeclampsia (experiment 2), in PE.

### Study design

Experiment 1: a longitudinal observation study. Experiment 2: Observational study.

### Study burden and risks

If possible (i.e. during pregnancy and preeclampsia) blood samples will be taken by means of extra blood samples during routine sampling in the hospital. For non-pregnant women, 20 ml of blood will be taken at a suitable time point. This will not pose any risk on the individuals.

Biopsies will be taken during caesarean section, performed as part of the treatment of the women. Therefore this will also not be associated with any risk for the patients.

## Contacts

**Public**
Universitair Medisch Centrum Groningen

Hanzeplein 1
9713 GZ
NL
**Scientific**
Universitair Medisch Centrum Groningen

Hanzeplein 1
9713 GZ
NL

# Trial sites

## Listed location countries

Netherlands

# Eligibility criteria

**Age**
Adults (18-64 years)
Elderly (65 years and older)

## Inclusion criteria

Experiment 1: Pregnant women who have been diagnosed to be at increased risk for developing preeclampsia, i.e. women who have been diagnosed with pre-existent hypertension, diabetes mellitus, vasculitis, renal disease, autoimmune disease, malignancy, or women with preeclampsia in their previous pregnancy, women carrying twins. ;Experiment 2:
Preeclamptic patients:
* Preeclampsia defined by the ISSHP criteria (see onderzoeksprotocol)
* Primigravid
* Age: >/<= 18 years and <40 years;Pregnant women who deliver preterm
* preterm delivery, i.e. before 36 weeks
* Age: >/<=18 years and <40 years;Pregnant women who deliver a growth restricted baby
* IUGR * Age: >/<=18 years and <40 years;Normal pregnant women:
* Primigravid
* Age: >/<= 18 years and <40 years;Control non-pregnant women :
* Healthy nulligravid women
* Age: >/<= 18 years and <40 years

## Exclusion criteria

Experiment 1: pregnant women without an increased risk of developing preeclampsia;Experiment 2:
Preeclamptic women:
Diagnosis of pre-existent hypertension,
diabetes mellitus,
vasculitis,
renal disease,
autoimmune disease,
malignancy, ;Healthy pregnant women:
* Multiparity
* Multiple pregnancy
* Fetal growth retardation
* Other pregnancy complications
* Hypertension
* Any known chronical illnesses
* Age: <18 years and >40 years
* smoking;Control non-pregnant women:
* Multiparity
* Age: <18 years and >40 years
* Existence of any known diseases
* smoking;pregnant women with preterm delivery
Diagnosis of
Treated pre-existent hypertension,
diabetes mellitus,
vasculitis,
renal disease,
autoimmune disease,
malignancy,
signs of infection

# Study design

## Design

| | |
|---|---|
| Study type: | Observational invasive |
| Intervention model: | Other |
| Allocation: | Non-randomized controlled trial |
| Masking: | Open (masking not used) |
| Control: | Active |

| | |
|---|---|
| Primary purpose: | Basic science |

### Recruitment

NL

| | |
|---|---|
| Recruitment status: | Recruitment stopped |
| Start date (anticipated): | 15-02-2011 |
| Enrollment: | 295 |
| Type: | Actual |

## Ethics review

| | |
|---|---|
| Approved WMO Date: | 20-01-2009 |
| Application type: | First submission |
| Review commission: | METC Universitair Medisch Centrum Groningen (Groningen) |
| Approved WMO Date: | 24-10-2011 |
| Application type: | Amendment |
| Review commission: | METC Universitair Medisch Centrum Groningen (Groningen) |

## Study registrations

### Followed up by the following (possibly more current) registration

No registrations found.

### Other (possibly less up-to-date) registrations in this register

No registrations found.

### In other registers

| Register | ID |
|---|---|
| CCMO | NL25930.042.08 |