REPROMETA and HAPPY PREGNANCY STUDY: combining the retrospective and prospective approach for discovery and development of new biomarkers for pregnancy complications

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OBJECTIVES:
The development of biomarkers for prediction of pregnancy complications benefits from the integrated approach of different study types. Recruitment of Estonian pregnant women with/without gestational complications (preeclampsia, gestational diabetes, fetal growth disorders) implementing both, a retrospective REPROMETA (REProgrammed fetal and/or maternal METAbolism) and a prospective HAPPY PREGNANCY (Development of novel non-invasive biomarkers for fertility and healthy pregnancy) study.

Recruitment center: Women’s Clinic of Tartu University Hospital (TUH)

REPROMETA study:
• recruitment at delivery (family trios/duos n=366) 2006-2011, 
• growth follow-up of children for two years 2008-2013: 
  uncomplicated pregnancy, normal birth-weight baby (n=110) 
  large-for-gestational age baby (n=89) 
  small-for-gestational age baby (n=64) 
severe preeclampsia (n=50)

HAPPY PREGNANCY study 2013-2015:
• ongoing recruitment of unselected pregnant women at the first visit 
• recruited n=1,600; final expected n=2,500 
  (2/3 of all pregnant women visiting TUH) 
• current prevalence of preeclampsia 3.8%, preterm delivery 5.4%, multiple pregnancy 5.4%, gestational diabetes 4.1%

DATA COLLECTION AND BIOBANK:
• clinical and epidemiological data, reproductive history, life style, dietary factors 
• REPROMETA: questionnaire (mother and father); child’s body parameters and health at 1,2,3,6,12 & 24 months 
• HAPPY PREGNANCY: three longitudinal questionnaires

REPROMETA: DNA: mother, father, placenta 
Plasma/serum: mother, father, umbilical blood RNA & paraffin blocks: placenta

HAPPY PREGNANCY: DNA: mother, placenta 
Plasma/serum: mother (1-5 longitudinal samples), umbilical cord 
Urine: mother (1-8 longitudinal samples)

CONCLUSION AND IMPLEMENTATION:
We have created a powerful biobank for the implementation in biomarker studies of pregnancy complications. 
Retrospective REPROMETA is valuable discovery source of new biomarkers as built on precisely defined recruitment criteria and clinically in-detail characterized patients (Söber et al 2014 Placenta, Laan et al 2014 Placenta). 
Prospective HAPPY PREGNANCY STUDY represents indispensable resource to translate discovery findings into clinical practice, implementation is actively ongoing in parallel with recruitment (www.happypregnancy.ut.ee/eng)

FURTHER REFERENCES:
The quality of REPROMETA was featured by M. Freemark in JCEM 2010

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