AARHUS UNIVERSITY

Press release

Please fill in this form and return it to graduateschoolhealth@au.dk in Word format along with a portrait photo in JPEG format, if you would like it to accompany your press release, no later than three weeks prior to your defence.

Basic information

Name: Anne-Cathrine F. Viuff Email: acviuff@clin.au.dk Phone: +45 30225093

Department of: Clinical Medicine

Main supervisor: Trine Brink Henriksen

Title of dissertation: Prenatal exposure to depression and antidepressant medication: An epigenetic perspective

Date for defence: 8 December at (time of day): 10 am Place: Eduard Bierman Auditorim, Lakeside Auditorium, Aarhus University, Bartholins Allé 3, 8000 Aarhus C

Press release (Danish)

Påvirkes barnet af depression og antidepressiv medicin i graviditeten: En epigenetisk vinkel.

Psykiske lidelser, så som angst og depression, er meget hyppige under graviditeten. Omkring 13% af alle gravide kvinder oplever symptomer på depression under deres graviditet. Der er godt belæg for, at børn af depressive mødre har en øget risiko for at blive påvirket i deres udvikling, og derfor er det vigtigt at disse kvinder modtager den korrekte behandling for deres lidelse. Både for at sikre deres eget liv og helbred, men også af hensyn til deres børn.
Et stigende antal kvinder får antidepressiv medicin under graviditeten. I Danmark og andre dele af Europa er omkring 4% af nyfødte børn i Danmark eksponerede for antidepressiv medicin i fostertilstanden. Præparaterne krydser moderkagen og kan findes i fosteret. Forskning har vist, at disse børn kan have en øget risiko for medfødte misdannelser og abstinenser efter fødslen, og også en øget risiko for at udvikle psykiske vanskeligheder senere i barndommen og ungdomslivet.
Der været en stigende interesse for at etablere en biologisk sammenhæng mellem depression og brug af antidepressiv medicin i graviditeten og det faktum, at disse børn i højere grad end andre børn oplever fysiske og psykiske vanskeligheder. En mulig forklaring på dette kan eventuelt findes i epigenetikken. Epigenetik omhandler kemiske processer, der har potentiale til at påvirke genernes oversættelse til proteiner, men uden at ændre på arvematerialets grundliggende struktur. Epigenetiske mønstre etableres i fosterlivet og spiller muligvis en vigtig rolle i barnets udvikling. Denne proces påvirkes af omgivelserne, herunder muligvis også af depression og brug af antidepressiv medicin hos den gravide. Den mest velbeskrevne epigenetiske mekanisme er DNA methylering hvor en methylgruppe påsættes DNA-strengen på specifikke dele. Vi har i afhandlingen beskæftiget os med denne mekanisme som mål for epigenetisk variation.
Målet med denne PhD-afhandling var, at undersøge sammenhængen mellem depression og brugen af antidepressiv medicin i graviditeten og variation i DNA methylering i navlesnorsblod hos nyfødte. Afhandlingen består af tre studier. I det første studie har vi sammenholdt tidligere forskning på området. Det andet studie undersøgte sammenhængen mellem depression i graviditeten og DNA methylering i navlesnorsblodet fra nyfødte i the Avon Longitudinal Study of Parents and Children, Bristol, UK. I det tredje studie undersøgte vi sammenhængen mellem brugen af antidepressiv medicin i graviditeten og DNA methylering i navlesnorsblodet hos børn i Aarhus Børns Fødselskohorte. Disse fødselskohorter er to af de største i Europa og meget velbeskrevne. Studierne viser en forskel i DNA methylering hos de børn, der har været udsat for depression eller antidepressiv medicin i graviditeten sammenlignet med børn af raske mødre. Det skal understreges at resultaterne af disse studier skal tolkes med forsigtighed og skal betragtes som grundlæggende for yderligere forskning i fremtiden.
Dette er et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Anne-Cathrine F. Viuff, MD, der forsvarer det d. 8/12-2017.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 08/12 kl. 10 i Eduard Bierman auditorium, Lakeside Auditoriums, Aarhus Universitet, Bartholins Allé 3, 8000 Aarhus C. Titlen på projektet er

”Prenatal exposure to depression and antidepressant medication in pregnancy: An epigenetic perspective”. Yderligere oplysninger: Ph.d.-studerende Anne-Cathrine F. Viuff, e-mail: acviuff@clin.au.dk, tlf. +45 30225093.

Bedømmelsesudvalg:
Consultant, PhD, Uffe Birk Jensen-chairman of the committee and moderator og the defence,
Dep. of Clinical Genetics, Aarhus University Hospital, Denmark.

Professor, PhD Hedvig Nordeng,
Department og Pharmacy, The Faculty of Mathematics and Natural Sciences, University of Oslo, Norway.

Senior Research Associate, PhD, Esther Walton,
School of Socail and Community Medicine, Faculty of Health Sciences, University of Bristol, UK

Press release (English)

Prenatal exposure to depression and antidepressant medication: An epigenetic perspective.

Depression is a common condition and up to 13% of women experience symptoms of depression during pregnancy. There is increasing evidence that children exposed to depression in their fetal life have an increased risk of experiencing adverse developmental outcomes. It is therefore very important that these women receive proper treatment both to secure their own health but also the health of their child.
An increasing number of women are prescribed antidepressant medication during pregnancy. In Denmark and other areas of Europe up to 4% of newborn children are exposed to antidepressant medication during their fetal life with up to 8% in the United States. The drugs cross the placenta and can be found in the foetus. Research has shown that these children may have an increased risk of congenital malformations and withdrawal symptoms at birth, but also an increased risk of psychiatric difficulties in childhood and adolescence.
Establishing a biological pathway of these associations has over the past years received increasing attention from researchers. One possible mechanism could be found in the field of epigenetics. Epigenetics is the study of molecular modifications of DNA that have the potential to influence gene expression, but do not change the DNA sequence. Formation of epigenetic patterns occurs partly during fetal life and may play an important role in child development. This process can be influenced by environmental factors which may include maternal depression and use of antidepressant medication. The most widely described epigenetic mechanism is DNA methylation where a methyl group is attached to the DNA sting at certain sites. In this thesis we used DNA methylation as a marker for epigenetic variation.
The aim of this thesis was to further investigate the association between antenatal maternal depression and use of antidepressant medication and the epigenetic variation in offspring cord blood. The thesis consists of three studies. The first study is a review of the existing literature in this field of research. The second study investigated the association between antenatal maternal depression and cord blood DNA methylation in 844 participants from the Avon Longitudinal Study of Parents and Children (ALSPAC), Bristol, UK. In the third study we investigated the association between maternal use of antidepressant medication during pregnancy and offspring cord blood DNA methylation in 176 participants from the Aarhus Birth Cohort (ABC). The birth cohorts are two of the largest in Europe and very well described. The review of previous literature did not lead to any firm conclusions on the effect of antidepressant medication in pregnancy on the epigenetic pattern. The two following studies did find an association between depression and the use of antidepressant medication in pregnancy and cord blood epigenetic variation in exposed versus unexposed children.
The results of the studies must however be interpreted with caution and viewed as hypothesis generating for further studies. The project was carried out by Anne-Cathrine F. Viuff, MD, who is defending her dissertation on 08/12-2017.

The defence is public and takes place on 08/12 at Eduard Bierman Auditorium, Lakeside Auditoriums, Aarhus University, Bartholins Allé 3, 8000 Aarhus C. The title of the project is "Prenatal exposure to depression and antidepressant medication: An epigenetic perspective". For more

information, please contact PhD student Anne-Cathrine F. Viuff, email: acviuff@clin.u.dk, Phone +45 30225093.

Assessment committee:

Consultant, PhD, Uffe Birk Jensen-chairman of the committee and moderator og the defence,
Dep. of Clinical Genetics, Aarhus University Hospital, Denmark.

Professor, PhD Hedvig Nordeng,
Department og Pharmacy, The Faculty of Mathematics and Natural Sciences, University of Oslo, Norway.

Senior Research Associate, PhD, Esther Walton,
School of Socail and Community Medicine, Faculty of Health Sciences, University of Bristol, UK

Permission

By sending in this form:

- I hereby grant permission to publish the above Danish and English press releases as well as any submitted photo.
- I confirm that I have been informed that any applicable inventions shall be treated confidentially and shall under no circumstances whatsoever be published, presented or mentioned prior to submission of a patent application, and that I have an obligation to inform my head of department and the university's Patents Committee if I believe I have made an invention in connection with my work. I also confirm that I am not aware that publication violates any other possible holders of a copyright.