Maternal Eating disorders: their effect on obstetric outcomes and child and adolescent outcomes, a study using data from the Danish National Birth Cohort

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Background: The eating disorders (ED) – anorexia nervosa (AN), bulimia nervosa (BN), binge-eating disorder (BED) and eating disorders not otherwise specified (EDNOS) - are common in women in developed countries. The average prevalence rates for AN and BN are 0.3% and 1%, respectively, in young Western women (Van Hoeken, Seidell, Hoek, 2003), but higher - up to 5-7 % - if partial syndromes are included. The onset of these disorders typically is in adolescence or young adulthood, i.e. in a critical phase of women’s reproductive life.

Eating Disorders: pregnancy and obstetric outcomes

In general ED symptoms have been shown to decrease during pregnancy. There is some evidence, however, of persistence of some ED symptoms or non-complete remission during pregnancy (Micali et al., 2007; Crow, Thuras, Keel, Mitchell, 2002). The few studies to date to examine pregnancy outcomes in women with ED have found conflicting results, possibly due to differences in study populations and power issues due to small sample sizes. Pregnancy and obstetric complications, such as a higher number of miscarriages, more preterm births, and more caesarean sections have consistently been associated with lifetime ED (for a review see Micali 2008). In our study on the ALSPAC sample we showed a two-fold increased risk of 2 or more previous miscarriages in women with lifetime BN compared to general population controls (Micali et al., 2007).

Eating disorders and foetal growth

The most consistent finding in relation to the effects of maternal ED on the offspring in the existing literature is that on birth weight. In particular all clinical studies find an association between maternal AN (active or past) and lower birth-weight babies, although the magnitude of the effect varies across studies. In our recent study on a large birth cohort (ALSPAC) we found a lower birth-weight in the offspring of women with lifetime AN (Micali et al., 2007). Moreover the effect of a maternal lifetime AN on birth-weight was mainly related to low maternal BMI pre-pregnancy and in part due to smoking in the second trimester (Micali et al., 2007). This study showed a specific effect of maternal AN on birth-weight.
This is particularly relevant for foetal development, given the available evidence on the effects of undernutrition/growth restriction in utero and foetal development (Micali & Treasure, 2009).

**ED and child outcomes**

Very few longitudinal studies have investigated the effects of maternal ED on child outcomes. Studies on small clinical populations have identified an increased risk for psychopathology in children of women with ED (Stein et al, 2006).

We have highlighted a differential effect of maternal ED on psychopathology in early childhood (3 and ½ years) in ALSPAC, in particular children of women with AN were more likely to have emotional disorders symptoms and children of women with BN showed higher level of conduct disorder symptoms (Micali et al, in preparation).

**Intergenerational transmission**

There is some evidence that ED are transmitted from parent to child (Bulik et al, 2007). The influences involved might be genetic or environmental (Strober et al., 2000; Field et al., 2001) and might be difficult to disentangle. We are currently studying the intergenerational transmission of ED in a large UK cohort (ALSPAC), by studying ED in the adolescents at age 14, 16, and 18. However large studies are needed to reliably identify the effects of parental ED due to the low prevalence of ED.

**Gaps in the current literature**

Despite some evidence that maternal ED predict adverse obstetric outcomes, only 2 large general population studies have investigated these outcomes. One showed an effect of maternal ED (Micali et al., 2007); the second provided only some evidence, due to limited power (Bulik et al., 2009). Given the low prevalence of ED in the general population and the limitations inherent in previous studies (i.e. small clinical studies or small number of cases identified) replication and extension of previous studies is needed. In particular we are seeking to extend our findings on the effects of maternal ED in the ALSPAC cohort.

Although we have started investigating the relationship between maternal ED and childhood and adolescent outcomes in relation to psychopathology and ED behaviours, large studies are needed to convincingly estimate the risk for psychopathology and eating behaviours in children of women with ED.

**Research questions:**

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1. Are maternal lifetime ED associated with an increased risk for negative obstetric outcomes (foetal deaths, preterm birth, instrumental delivery, lower Apgar scores)?
2. Do babies of women with lifetime AN have lower birth-weight, lower head circumference, lower ponder index and lower abdominal circumference compared to those of general population controls?
3. Do maternal lifetime ED affect child psychopathology at age 7?
4. Do maternal lifetime ED predict offspring disordered eating behaviours and increased dieting in pre-adolescence (age 11)?

**Design:** This is a cohort study using data from a longitudinal study of pregnant women and their children: the Danish National Birth Cohort.

**Subjects:** We will include all women who participated in Interview 1 (12-16 weeks gestation) in the study. During Interview 1 2559 women reported a lifetime BN, 2471 reported a lifetime AN. We will also study subgroups of women who answered yes to questions about having had an ED in the last 6 months. Relevant outcomes will be obtained from Interviews 2, 3, 4 and questionnaires for 7 years old and pre-adolescents (aged 11 years).

**Statistical analyses:** We will compare relevant outcomes in women who reported a lifetime ED and remaining women (the rest of the cohort). Logistic, linear regression, Cox’ regression models will be used as appropriate. Relevant multilevel regression models and Generalized Estimating Equations (GEE) model will be used as necessary for repeated outcomes. Relevant confounders (including socio-demographic variables) will be included in all analyses as appropriate.

**References**


