Prolonged pregnancy: methods, causal determinants and outcome

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ABSTRACT

The Ph.D. dissertation was a result of my employment at Clinical Institute, Department of Gynaecology and Obstetrics, Odense University Hospital, and Institute of Epidemiology and Social Medicine, Danish Epidemiology Science Centre, Aarhus University. It includes five papers and a review.

Prolonged pregnancy, defined as a pregnancy with a gestational length of 294 days or more, is a frequent condition. It is associated with an increased risk of foetal and maternal complications. Little is known about the aetiology of prolonged pregnancy.

The aims of the dissertation were 1) to study the incidence of prolonged pregnancy as a function of methods for determining gestational age; 2) to determine the risk of obstetrical and foetal complications in prolonged pregnancy; 3) to validate the self-reported gestational age in the National Birth Cohort; 4) to determine whether an ultrasound scan in the first or second trimester, or menstrual history was best at predicting the day of delivery; 5) to study the risk of recurrence of prolonged pregnancy as a function of change in male partner, social status and municipality; and 6) to detect prenatal risk indicators of prolonged pregnancy.

Data from the Medical Birth Register and the National Discharge Register from the period 1978 to 1995 were used to study the incidence of post-term delivery and determine the risk of complications associated with this condition. Data were furthermore linked to the Fertility Database to study the risk of recurrence of prolonged pregnancy as a function of change in male partner and social conditions. The National Birth Cohort provided data for the study on prenatal risk indicators of prolonged pregnancy in a follow-up design. The self-reported gestational ages from this database for women who delivered in Vejle county, were compared to the ultrasound measurements from their medical records, and to the gestational ages reported to the National Discharge Register. Finally, healthy women in Odense were enrolled in an ultrasound study to detect the accuracy and precision of methods to estimate the day of delivery.

The incidence of post-term delivery was 9.0% in the Medical Birth Register in the period 1978-1993. The incidence of post-term delivery, when gestational age was estimated by an ultrasound scan in the second trimester was approximately 4%. The risk of perinatal and obstetrical complications was high in post-term delivery compared to term delivery (OR between 1.2 and 3.1). The risk of perinatal death (OR=1.36 (1.08-1.72)) was also higher in the post-term group. The self-reported gestational ages in the National Birth Cohort correlated well with data from the National Hospital Discharge Register and with ultrasound-estimated gestational age in Vejle county. An ultrasound scan in the second trimester was the most valid method to predict the day of delivery, followed by an ultrasound scan in the first trimester, and a corrected last menstrual period. The risk of recurrence of post-term delivery was reduced if the male partner changed between pregnancies. Paternal genetic contribution to the aetiology of post-term delivery may explain the findings. Finally, we found a strong dose-response association between both high body mass index before pregnancy and large gestational weight gain, and post-term delivery.

Further studies on the association between maternal body mass index and gestational weight and the risk of a post-term delivery and its complications are required. One of the next steps will be to follow the outcomes of mothers and children studied in the National Birth Cohort, in order to estimate the effect of maternal weight on the risk of adverse outcomes in prolonged pregnancies.