

## RESEARCH POINTERS

## Risk of recurrence of prolonged pregnancy

## Paternal genes as expressed by the fetus play a role in the timing of birth and in the risk of repeating a prolonged pregnancy

Danish  
Epidemiology  
Science Centre,  
University of  
Aarhus, DK-8000  
Aarhus C, Denmark  
Annette Wind  
Olesen  
*research fellow*  
Olga Basso  
*senior researcher*  
Jørn Olsen  
*professor*

Correspondence to:  
A W Olesen  
a.w.olesen@  
mail1.stofanet.dk

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Prolonged pregnancy—a pregnancy with a gestational length of 294 days or more—occurs in about 5% of all births. It is associated with a higher frequency of obstetric complications and perinatal morbidity,<sup>1</sup> and little is known about its aetiology.<sup>2</sup> We studied the risk of recurrence of prolonged pregnancy as a function of change in partner or change in social conditions.

## Methods and results

We obtained data recorded in the Danish medical birth registry on all women with a prolonged pregnancy in the first delivery and in a subsequent delivery, during 1980-94, and a 5% sample of all women with two or more pregnancies recorded in the period 1980-92 (only the first two deliveries were used for analysis). The information on gestational age in the registry was obtained from birth records that had been completed by midwives. Data on social status and municipality of residence stem from various population registers.

The post-term cohort included all women who gave birth to a singleton live infant recorded as post-term (gestational age 42 weeks or more) and a subsequent live infant. The term cohort included all women who had a first singleton live infant born at term (that is, gestational age 37-41 weeks) and a subsequent live infant. After excluding cases with missing information on gestational age (393 post-term cohort, 635 term cohort), paternity (184, 0), and stillborns (300, 177), we had 21 746 sibling pairs in the post-term cohort and 7009 sibling pairs in the term cohort.

We studied the effect of changes in potential risk factors between pregnancies on post-term delivery with the computerised square dance design,<sup>3</sup> which is based on Mackie's concept of causation.<sup>4</sup> The basic idea is to study the effect of removing possible component causes from a causal field among the participants exposed to the variable being studied. The design is based on internal comparison within the two cohorts.

The risk of recurrence of post-term delivery was 19.9%. It increased with increasing gestational age in the index birth to approximately 30% for a gestational age of 44 weeks. In the term cohort 7.7% were post-term in the subsequent birth.

The risk of recurrence of post-term delivery was reduced to 15.4% when the first and second child had different fathers (0.73, 0.63 to 0.84) (table). Having a different father did not affect the risk of post-term delivery of the second child in the term cohort (0.99, 0.69 to 1.41). A change in municipality and social status had no impact on the risk of recurrence of prolonged pregnancy.

Length of pregnancy differed by more than one week in women who had changed partners, compared with those who had not (odds ratios 1.26, 1.13 to 1.41 in post-term cohort and 1.27, 1.04 to 1.54 in term cohort).

## Comment

Women had a reduced risk of recurrent post-term delivery if they changed partner between pregnancies (table). We believe that this is a new observation. This result suggests that the timing of birth may, in part, be determined by paternal genes.

We have no information on induced labour before 42 weeks, but we have no reason to believe that labour was induced more frequently in women who had changed their partner between pregnancies. Induced labour probably contributes to misclassification in the analysis of risk of post-term delivery, but this is probably non-differential and underestimates the association with prolonged pregnancy. Furthermore, inducing labour before 42 weeks is unusual in Denmark.<sup>5</sup> Misclassification of fathers—that is, a tendency not to report a new partner on the birth record—would probably lead to an underestimation of the partner effect since we expect this misclassification to be independent of gestational age.

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Contributors: JO had the idea for the study and designed it; he also helped to revise the article. OB helped to analyse the data and revise the article; she also helped with the interpretation of the data. AWO carried out all the data analysis and wrote the first draft of the paper. AWO is the guarantor of the study.

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Risk of post-term delivery in women giving birth in Denmark. Results are odds ratios (95% confidence intervals)

Changes	Post-term cohort (≥42 weeks)		Term cohort (37-41 weeks)	
	Crude	Adjusted*	Crude	Adjusted*
None	1	1	1	1
Male partner	0.74	0.73 (0.63 to 0.84)	0.93	0.99 (0.69 to 1.41)
Municipality	0.93	0.96 (0.88 to 1.05)	0.89	0.83 (0.64 to 1.07)
Social status:				
Decline	0.91	0.92 (0.80 to 1.05)	0.80	0.78 (0.52 to 1.18)
Rise	0.97	1.00 (0.91 to 1.09)	0.98	1.06 (0.81 to 1.38)

\*Adjusted for maternal age (≤19, 20-24, 25-29, 30-34, ≥35 years), interpregnancy interval (<1, 1, 2, 3, 4, 5, 6, ≥7 years), social status of the mother at index birth (low, middle, high), and county of residence at the birth of the subsequent child.