

Prof Jens Peter Bonde  
Aarhus University Hospital  
Department of Occupational Medicine  
Noerrebrogade 44, build 2C  
8000 Aarhus Denmark  
Email: jpbon@as.aaa.dk

### **Prenatal tobacco exposure and semen quality**

Cecilia Høst Ramlau-Hansen (Aarhus University Hospital, Aarhus, Denmark), Ane Marie Thulstrup (University Hospital, Aarhus, Denmark), Lone Storgaard (Aarhus University Hospital, Aarhus, Denmark), Gunnar Toft (Aarhus University Hospital, Aarhus, Denmark), Jørn Olsen (UCLA School of Public Health, Los Angeles, USA), Jens Peter Bonde\* (Aarhus University Hospital, Aarhus, Denmark).

**Background:** A few studies indicate that exposure to maternal smoking during fetal life decreases semen quality in adult life, but the results are inconsistent and retrospectively collected smoking data were used in most studies.

**Methodology:** From a Danish pregnancy cohort established in 1984-87, 347 sons out of 5,109 sons were selected according to their exposure to tobacco smoke in fetal life. From February 2005 to January 2006, a semen sample from the 347 men was analyzed for conventional semen characteristics according to standardized criteria by using a mobile laboratory.

**Results:** We found an inverse association between maternal smoking during pregnancy and total sperm count ( $p=0.002$ ). Men exposed to >19 cigarettes daily during pregnancy had approximately 19% lower semen volume ( $p=0.04$ ), 38% lower total sperm count ( $p=0.11$ ), and 17% lower sperm concentration ( $p=0.47$ ) compared with unexposed men. The odds ratio for oligospermia was 2.16 (95% confidence interval: 0.68, 6.87) among exposed men compared with the unexposed. No associations were found for sperm motility or morphology.

**Implications:** These results indicate that prenatal exposure to tobacco smoke may have an adverse effect on semen quality and if these associations are causal they could explain some of the reported differences between populations and secular changes in semen quality.