

Abstracts

DCM among proof-printing workers. All patients were pathologically diagnosed with cholangiocarcinoma. Age at diagnosis ranged from 25–45 years. Primary cancer sites included the intrahepatic bile duct (five patients) and the extrahepatic bile ducts (six patients). All patients were exposed to 1,2-DCP for 7–17 years and diagnosed with cholangiocarcinoma 7–20 years after the first exposure. Ten patients were also exposed to DCM for 1–13 years. Six of the patients had died by 2011 and the SMR for cholangiocarcinoma was 2,900 (expected deaths: 0.00204, 95% confidence interval: 1.100–6.400).

Conclusion These findings suggest that 1,2-DCP and/or DCM may cause cholangiocarcinoma in humans. New patients appeared among the company workers in 2012 and 2013, and the current number of patients has reached 17.

Session: Plenary session RICOH: Introduction and work activities

212 WORK ACTIVITIES AND ADVERSE PREGNANCY OUTCOMES: A SYSTEMATIC REVIEW

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Objectives To assess the relation between five common occupational exposures (working hours, shift work, lifting, standing, workload) and five adverse outcomes of pregnancy (pre-term delivery (PTD), low birthweight, small for gestational age (SGA), pre-eclampsia, gestational hypertension).

Methods We conducted a search in MEDLINE and EMBASE (1966–2011) using combinations of keywords and MeSH terms. Reports were assessed for their reporting and potential for bias and confounding. Meta-estimates of relative risk (RR) were produced where possible. The material comprised 86 reports (57 reports with usable data on PTD, 54 on birthweight and 11 on pre-eclampsia/gestational hypertension).

Results For PTD, findings across a large evidence base were consistent in ruling out large effects (e.g. RR>1.2). Larger and better quality studies were even less positive (RR 1.04 to 1.18). For SGA, the position was similar but meta-estimates were close to the null. For pre-eclampsia/gestational hypertension the evidence base was insufficient to draw strong conclusions.

Conclusions The balance of evidence is not compelling enough to justify mandatory restrictions on any of the activities considered in this review. Over time, estimates of risk for these activities and outcomes have become smaller.

213 RISK OF MISCARRIAGE IN RELATION TO WORK AT NIGHT, WORK HOURS, LIFTING AND STANDING: A META-ANALYSIS

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Objectives Miscarriage is a prevalent adverse pregnancy outcome that has been linked to ergonomic risk factors at work in numerous studies but no scientific consensus has emerged. In order to improve the impact of occupational health counselling of pregnant women the objective of this study was to quantify the risk of miscarriage according to prevalent work activities and to discuss causal inference based upon all available scientific data.

Methods A search in Medline and EMBASE 1966 - 2012 identified 29 primary papers reporting the relative risk (RR) of miscarriage according to work at night, long working hours, heavy lifting or prolonged standing. Following an assessment of completeness of reporting, confounding and bias, each risk estimate was characterised as more or less likely to be biased. Studies with equivalent measures of exposure were pooled to obtain a weighted common risk estimate. Sensitivity analyses excluded studies most likely to be biased.

Results Working fixed nights was associated with a moderately increased risk of miscarriage [pooled RR 1.51 (95% CI 1.27–1.78, n = 5)], while working for more than 40–52 hours weekly, lifting>100 kg/day and standing > 6–8 hours/day were associated with small risk increments: the pooled RRs ranging from 1.16 (prolonged standing, number of risk estimates 6) to 1.33 (working hours, number of risk estimates 9). Most RRs tended to become smaller and statistically non-significant when analyses were restricted to higher quality studies.

Conclusions These largely reassuring findings do not provide a case for mandatory restrictions in relation to working fixed night shifts, long working hours, occupational lifting and prolonged standing. Considering the limited evidence base, however, it seems prudent to advise women against work entailing high levels of these exposures.

214 OCCUPATIONAL LIFTING AND FETAL DEATH: FINDINGS FROM THE DANISH NATIONAL BIRTH COHORT USING A INDUSTRY-JOB EXPOSURE MATRIX

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Objective We have in an earlier prospective cohort study observed a moderately increased risk of miscarriage based upon self-reported information on occupational lifting. In this paper we aim to corroborate or refute this observation by application of a industry-job exposure matrix for pregnant women.

Methods For 68,096 occupationally active women, who participated in the Danish National Birth Cohort, information on occupational lifting was collected by telephone interviews around gestational week 16. We established an industry-job exposure matrix (IJEM) by computing the industry and job specific mean values of the pregnant women's self-reported daily lifting activities while pregnant. Subsequently all women were assigned IJEM value for her industry and job. The associations between occupational lifting and early miscarriage (12 weeks or less), late miscarriage (13–21 weeks), and stillbirth (22 weeks or more) were analysed using Cox regression models with gestational age as the underlying time variable and adjustment for age, body mass index, parity, smoking and alcohol consumption.

Results We observed 2,726 pregnancy losses in a cohort of 68,096 pregnant women. We found no consistent associations between increased heavy lifting and pregnancy losses up to gestational week 21. However, for fetal death occurring after week 21 we found an increased risk among women lifting more than 200 kg/day (Hazard Ratio (HR) = 1.55; 95% Confidence Interval (CI): 1.03–2.35) compared to non-lifting women. After controlling for potential confounders, the result for stillbirths became insignificant, but the estimate did not change much (HR = 1.40; 95%CI: 0.92–2.14).

Conclusion The study corroborates earlier findings in the Danish National Birth Cohort that occupational lifting is related to an increased risk for fetal death. Due to the prospective design with late enrollment into the study, ascertainment of early miscarriage is incomplete and therefore the study does not provide strong evidence on risk for early miscarriage.

215 PRETERM BIRTH IN RELATION TO OCCUPATIONAL LIFTING ASSESSED BY A JOB EXPOSURE MATRIX: FINDINGS FROM THE DANISH NATIONAL BIRTH COHORT

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Objective The question remains unresolved if the risk of preterm birth increases with increasing occupational lifting. Previous studies have generally used individual-based exposure assessment relying on self-report, and based on this approach, we have observed an exposure-response relation between total load lifted per day and preterm birth.¹ To corroborate our finding, we aimed to examine the risk of preterm birth among primigravidas in relation to occupational lifting during pregnancy using group-based exposure assessment.

Methods Within the Danish National Birth Cohort (DNBC), we identified 24,833 occupationally active primigravidas with singleton pregnancies, who as a minimum entered gestational week 23 and provided interview data while pregnant. We constructed a Job Exposure Matrix (JEM) based on information from all women in the DNBC, who were pregnant when interviewed. The JEM cross-tabulated job and industry information with average total loads lifted per day. Each woman received an exposure estimate from the JEM. We used Cox regression analysis adjusting for age, smoking, BMI, and alcohol consumption. The women were followed from start of week 23 or interview date, whichever came last, until end of week 37 or pregnancy termination, whichever came first.

Results A total of 1601 preterm births occurred. Adjusted HRs increased with increasing occupational lifting, reaching a HR of 1.42 (95% CI 1.13–1.77) for women in the highest exposure category (>200 kg per day), when compared to non-lifters.

Conclusion We used group-based exposure assessment to minimise information bias and attenuation of exposure-response relations. Among women in jobs categorised with a lifting exposure of >200 kg per day, we found support for a moderately increased risk of preterm birth.

REFERENCE

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Session: Parallel session 1 RICOH: Stress, shift work and occupations with chemical exposure

216 RISK OF CRYPTORCHIDISM IN SONS OF FARMERS AND HORTICULTURAL WORKERS IN DENMARK

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Objectives Previous studies indicate that sons of women working with pesticides may have an increased risk of cryptorchidism. This study assessed the risk of cryptorchidism among boys of parents employed as farmers or horticultural workers using nationwide registers on parental occupation and cryptorchidism diagnoses.

Methods Our study cohort of more than 600,000 boys included all boys born in Denmark from 1980 to 2007 with a mother or father in employment during pregnancy. The cohort was followed for the occurrence of cryptorchidism and orchiopexy from 1980 to 2009 comparing the risk in sons of horticultural workers and farmers with sons of parents in other occupations. Hazard ratios (HR) and 95% confidence intervals (CI) were estimated using Cox regression adjusting for maternal and paternal age, birth years and parity.

Results Maternal employment as farmer was associated with moderately increased risks of cryptorchidism (cases 157; HR 1.31; 95% CI 1.12–1.53) and orchiopexy (cases 111; HR 1.29; 95% CI 1.07–1.56) compared to children of mothers in other occupations (15511 cases of cryptorchidism and 9963 of orchiopexy). Paternal occupation as farmer was unrelated to the risk in sons. Maternal occupation as horticultural worker was associated with non-significantly increased risks of cryptorchidism (cases 72; HR 1.20; 95% CI 0.95–1.52) and orchiopexy (cases 51; HR 1.28; 0.97–1.68). Similar associations were found for paternal horticultural workers. Prior but not current maternal employment as horticultural worker or farmer was not associated with an increased risk.

Conclusions This register-based study provides support for a possible association between maternal employment as a farmer during pregnancy and cryptorchidism in boys. Our finding of similarly increased risks in sons of mothers and fathers employed as horticultural workers question whether this association is causally related to pesticide exposure or has alternative explanations.

217 PREGNANCIES IN A PROSPECTIVE COHORT OF WOMEN IN NON-TRADITIONAL WORK (THE WHAT-ME STUDY)

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Objectives The WHAT-ME study (Women's health in apprenticeship trades- metalworkers and electricians) was established because of concerns about risk to the fetus of women welding in pregnancy.

Methods Women in registered apprenticeships since 2005 in welding, boiler-making, steam fitting/pipfitting ('welders') or electrical trades are invited to join the study. They complete questionnaires on health and exposure at baseline and