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**SLEEP DURATION AND BREAST CANCER RISK: A META-ANALYSIS**

doi:10.1136/jech.2010.120956.80

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**Background** It is hypothesised that sleep duration affects the production of melatonin and subsequently influences cancer risk. The relationship between sleep duration and risk of breast cancer has been investigated recently but findings from epidemiological studies have been inconsistent and have not been summarised quantitatively. We aimed to conduct a meta-analysis of observational studies of the association between sleep duration and breast cancer.

**Methods** Relevant publications were identified from reviews and computer-aided searches using PubMed, with keywords “sleep duration”, “breast cancer”, “survival rate”, “mortality”, “morbidity”, “incidence” and “risk”, up to July 23rd, 2009. RR estimates and 95% CIs were extracted for the comparison between the highest exposure group, women who slept  $\geq 9$  hours, and the reference group that comprised women who had a moderate sleep duration (7 or 8 hours). Summary RRs were estimated by calculating the average of the log RRs, weighted by the inverse variances of the log RRs.

**Results** Five studies, four with prospective data and one case-control study, were identified on the risk of breast cancer in relation to sleep duration. The published data include 9166 women with incident invasive breast cancer and 147 344 women without breast cancer. When results from these studies were combined, the aggregate RR was 0.96 (95% CI 0.86 to 1.07) for women with the longest sleep duration compared to those in the reference group with a shorter sleep duration. When analysis was restricted to prospective data, the aggregate RR was 0.89 (95% CI 0.78 to 1.01). There was no evidence for significant heterogeneity in this association by menopausal status.

**Conclusion** Meta-analysis of the published epidemiological data provides no strong evidence for a relationship between sleep duration and risk of breast cancer.

**Plenary**

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**PREDICTORS OF SURVIVAL IN CHILDREN BORN WITH DOWN SYNDROME**

doi:10.1136/jech.2010.120956.81

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**Objective** To investigate the influences of survival in children born with Down Syndrome.

**Design** Population-based case-series derived from the Northern Congenital Abnormality Survey.

**Setting** A geographically distinct area of Northeast England, incorporating North Cumbria, Northumberland, Tyne and Wear, Country Durham, and the Tees Valley.

**Participants** 1101 individuals with Down Syndrome delivered between 01 January 1985 and 31 December 2003, of whom 697 were live born and 664 (95%) were traced for their survival status on 28 January 2008.

**Main outcome measures** Overall prevalence of Down Syndrome. Frequency of additional structural anomalies among cases of Down Syndrome. 10-year survival for all cases of Down Syndrome, by time-period, and by presence, and type, of additional structural anomalies. Independent influence of year of birth, sex, plurality, gestational age, birthweight (standardised for sex, plurality, and

gestational age), maternal age, index of multiple deprivation, prenatal diagnosis, and presence, and type, of additional structural anomalies on survival.

**Results** Overall prevalence of Down Syndrome was 16.7 per 10 000 registered births (95% CI 15.6 to 17.6). 697 (63%) cases had no additional structural anomalies, 320 (29%) had isolated cardiovascular anomalies, 27 (2%) had isolated digestive system anomalies, 26 (2%) had both cardiovascular and digestive system anomalies, and 31 (3%) had at least one other structural congenital anomaly. 10-year survival among children born with Down syndrome was 83.9% (95% CI 80.9 to 86.5). Survival increased significantly with time ( $p < 0.001$ ), from a 10-year survival of 78.2% (95% CI 72.4 to 83.0) in 1985–1990 to 91.1% (86.7 to 94.1) in 1997–2003. Presence of an additional structural anomaly significantly reduced survival ( $p < 0.001$ ) from a 10-year survival of 94.1% (95% CI 90.9 to 96.1) among those with no additional anomaly to 75.2% (69.5 to 80.0), 68.4% (42.8 to 84.4), 54.2% (32.7 to 71.4), and 76.9% (44.2 to 91.9) among those with cardiovascular anomalies, digestive system anomalies, both cardiovascular and digestive system anomalies, and at least one other structural anomaly respectively. Of the other factors examined, only gestational age ( $p < 0.001$ ) and standardised birthweight ( $p = 0.008$ ) also independently predicted survival.

**Conclusion** Independent of significant improvement over time, survival of children born with Down syndrome is influenced by gestational age, birthweight, and the presence of additional structural anomalies. This information will be valuable for families and health care professionals when Down Syndrome is detected, and will assist in planning, assessing, and aiding, the future care needs of those affected.

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**MATERNAL EMPLOYMENT AND CHILD SOCIO-EMOTIONAL BEHAVIOUR: LONGITUDINAL EVIDENCE FROM THE MILLENNIUM COHORT STUDY**

doi:10.1136/jech.2010.120956.82

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**Objective** To examine the effects of parental employment in the early years on child socio-emotional behaviour at age 5 in a recent birth cohort study in the UK.

**Design** Prospective cohort study.

**Setting** The Millennium Cohort Study (MCS): a large, representative sample of children born in the UK between September 2000 and January 2002 ( $n = 18\,819$  at sweep 1).

**Participants** Singleton births in households in which a mother was present in the first three sweeps of the MCS, when participants were 9 months, 3 years and 5 years. Analysis was restricted to white children as there was large ethnic variation in maternal employment, but inadequate power to stratify by ethnicity.

**Main outcome measure** The Strengths and Difficulties Questionnaire (SDQ) with clinically relevant cut-points for problem behaviours. The SDQ is a widely used instrument for assessing socio-emotional difficulties in children.

**Methods** Data on parental employment across the three sweeps were used to investigate: (i) whether children whose mothers were in paid work during their first five years were more likely than children whose mothers were at home full-time to display adverse behavioural symptoms at age 5, independent of maternal education, mental health or economic position; (ii) whether effects of maternal employment on child socio-emotional development were cumulative in nature, or whether children were more sensitive to the effects of maternal employment during their first year; and (iii) the effects of different types of parental work arrangements on child socio-emotional behaviour at age 5.