

Divan HA, Kheifets L, Obel C, Olsen J. Prenatal and postnatal exposure to cell phone use and behavioral problems in children. *Epidemiology* 2008;19(4):523-529

Reviewed by Imo Inyang, Geza Benke & Michael Abramson

- **What is this study about, where was it done and in what population?**

This study was based on a larger Danish Birth Cohort which recruited a total of 101,032 pregnancies between March 1996 and November 2002. The authors investigated associations between in utero (prenatal) and post natal exposures to mobile (cell) phones and behavioural problems in children, using a questionnaire. The study was based on information about children born between 1997 and 1999.

- **What are the major strengths of this study?**

The study had a large sample size (13,159) and a reasonable response rate (65%) and thus was sufficiently powered to detect subtle differences between exposed and unexposed. Almost half the children were unexposed, providing a good comparison group.

- **What are the weaknesses of the study?**

This study has a number of other methodological limitations including:

- Failure to adjust for the effects of prematurity, gestational age and birth weight – all known causes of behavioural problems.
- Maternal recall may be influenced by previous negative or positive reproductive experiences
- Parity (number of pregnancies) may affect recall of exposure
- Paternal psychiatric history not discussed, but is also a risk factor for behavioural problems in children
- No discussion of breast feeding
- Abuse of alcohol and other psychotropic drugs not investigated
- Exposure to ionising radiation e.g. X-rays not assessed.
- Possibility of temporal confounding by other triggers such as effect of season on physical activity

- **What were the main findings?**

There was a significant association (1.8 fold increased risk) between behavioural problems and both prenatal and post natal exposure to mobile phones after adjusting for the confounding effects of the sex of the child, mother's age, smoking during pregnancy, mother's psychiatric problems and socio-occupational levels.

- **How should the results be interpreted?**

We need to distinguish between ‘association’ and ‘causation’. In this case, the authors found an association between prenatal and post-natal exposure to mobile phones based on 7 year retrospective recall of mothers and behavioural problems in children. An association means that the exposure and the outcome go together, but doesn’t mean that one necessarily causes the other. For example, it is possible that both mobile phone exposure and behavioural problems in children were due to a common cause, such as overworked parents. Although this was a cohort study, there was still potential for recall bias and associated exposure misclassification. As the authors note in the paper, results should be interpreted with caution.

- **What conclusions should be drawn?**

Although this study demonstrated statistically significant associations between prenatal and postnatal exposures to mobile phones and behavioural difficulties in children, the authors failed to adjust for a number of possible confounding factors. The exposure assessment was limited and probably resulted in misclassification because of maternal recall bias. Therefore there is need for caution in accepting these results at face value.

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