

## References

- 1 Bernitz S, Rolland R, Blix E, Jacobsen M, Sjoborg K, Oian P. Is the operative delivery rate in low-risk women dependent on the level of birth care? A randomised controlled trial. *BJOG* 2011;118:1357–64.
- 2 Ashworth P, El Fara A, Ebaji S. Level of birth care and operative delivery rates. *BJOG* 2012;119:377.

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### Shift work and adverse pregnancy outcomes: comments on a recent meta-analysis

Sir,

Regarding the recent meta-analysis on shift work and pregnancy outcomes,<sup>1</sup> we disagree that ‘any effects of shift work on preterm delivery are likely to be small’. These conclusions were based on a sensitivity analysis in which the authors excluded studies they deemed to be ‘of lower quality’. Some studies were excluded because shift work and preterm delivery were self-reported on the same instrument, assumed to result in recall bias. However, there is little evidence that women inaccurately report gestational age, especially in broad categories. As Gordis said:

Although a potential for recall bias is self-evident in case–control studies, in point of fact, there are few actual examples that demonstrate that recall bias has in fact been a major problem in case–control studies and has led to erroneous conclusions regarding associations.<sup>2</sup> Items that are subjective (e.g. pain intensity), that participants pay little attention to (e.g. minor headache), or that are sensitive (e.g. illicit drugs) might be more prone to recall bias.<sup>3</sup> Preterm birth and shift work do not meet these conditions.

Other studies were excluded from the sensitivity analysis of preterm delivery for not controlling for smoking and socio-economic status. This approach ignores variations in study design/population that determine the potential for confounding (e.g. confounding factors such as income and education are unlikely in a cohort of nurses) and the magnitude of potential confounding (resulting from variations in the prevalence of confounding factors). We assert that the *potential* for uncontrolled confounding does not necessarily mean that confounding *occurred*. We suggest conducting a subanalysis among the studies that provided both crude and adjusted data, then comparing the pooled odds ratio generated from the crude data with that from the adjusted data. If the difference between the two pooled odds ratios is small, including studies without adjustment may be appropriate.

The authors used data from Misra’s study,<sup>4</sup> in which unemployed women were used as the reference group (OR 1.0, 95% CI 0.59–1.69). However, sufficient raw data were available in the paper to calculate a crude odds ratio using employed non-shift workers as a reference group (OR 1.4, 95% CI 0.87–2.32). Given the bias introduced by comparing shift workers with non-workers, we feel using employed non-shift workers would be more comparable with other studies used in the meta-analysis. We are also concerned with the completeness of the literature search: when we duplicated the search as described by the authors, we found additional studies meeting the authors’ inclusion criteria that were not cited by them.<sup>5,6</sup>

In their discussion, the authors note an increased risk of preterm delivery with shift work in countries with weaker support for prenatal leave. The authors could address this quantitatively by stratifying the analysis by whether or not the country where the study occurred supports prenatal leave. A subanalysis examining early and late preterm birth separately should also be considered, as our previous work found that night work was associated with an increased risk of early but not late preterm birth.

Because this topic generates considerable public interest, we feel that the interpretation of the results should be reconsidered. ■

## References

- 1 Bonzini M, Palmer K, Coggon D, Carugno M, Cromi A, Ferrario M. Shift work and pregnancy outcomes: a systematic review with meta-analysis of currently available epidemiological studies. *BJOG* 2011; 118:1429–37.
- 2 Gordis L. *Epidemiology*, 3rd edn. Philadelphia: Elsevier, Inc., 2004.
- 3 Savitz DA. *Interpreting Epidemiologic Evidence: Strategies for Study Design and Analysis*. New York: Oxford University Press, 2003.
- 4 Misra DP, Strobino DM, Stashinko EE, Nagey DA, Nanda J. Effects of physical activity on preterm birth. *Am J Epidemiol* 1998;147(7): 628–35.
- 5 Lawson CC, Whelan EA, Hibert EN, Grajewski B, Spiegelman D, Rich-Edwards JW. Occupational factors and risk of preterm birth in nurses. *Am J Obstet Gynecol*. 2009;200(1):51 e1–8.
- 6 Chang PJ, Chu LC, Hsieh WS, Chuang YL, Lin SJ, Chen PC. Working hours and risk of gestational hypertension and pre-eclampsia. *Occup Med (Lond)* 2010;60(1):66–71.

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