Observational study

Trends in maternal morbidity relating to time of delivery need further exploration

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Commentary on: Lyndon A, Lee HC, Gay C, *et al* Effect of time of birth on maternal morbidity during childbirth hospitalization in California. *Am J Obstet Gynecol* 2015;213:705.e1–11.

Implications for practice and research

- Women giving birth at night may be a higher risk population, reinforcing the need for regular observations to detect morbidities early.
- Further research is needed taking into account the time of severe morbidity events and their underlying causes in order to investigate variation in outcomes by the time of day.

Context

There is increasing interest worldwide, particularly in high-resource countries, in assessing variation in the outcomes of maternity care according to the time of day or day of the week. Such analyses are usually intended to examine the impact of variation in staffing levels or capacity, with the aim of identifying actions to improve the safety of maternity care. This study by Lyndon *et al* focused on the outcomes of pelvic floor morbidity and severe maternal morbidity, and it examined the occurrence of these in relation to the time and day of women's delivery.

Methods

This study used linked hospital data from California on almost 1 500 000 women who gave birth between 2005 and 2007 to investigate the incidence of pelvic floor morbidity (including episiotomy as well as third and fourth degree tears) and severe maternal morbidity (a composite outcome including 12 different morbidities such as postpartum haemorrhage). The variation in incidence of these morbidities was investigated according to the time of day the women gave birth, adjusted for possible confounding or risk factors, including maternal age, race, ethnicity, level of education, insurance status, adequacy of prenatal care and presence of pre-eclampsia or chronic hypertension.

Findings

Almost 16% of women had a pelvic floor morbidity, and 0.6% had a severe maternal morbidity. After adjustment, pelvic floor morbidity was

more likely in women who gave birth between 11:00 and 23:00, and severe maternal morbidity was more likely in women who delivered between 23:01 and 07:00. Caesarean delivery, older maternal age, pre-eclampsia, chronic hypertension, lack of or government insurance, Hispanic ethnicity and Caucasian race were also associated with severe maternal morbidity.

Commentary

The study used routine hospital data to examine variation in outcomes according to the time of birth. Studies using routine hospital data have a number of limitations.¹ Adjustment for potential confounding factors can only be made when the relevant information is available within the data set used. The authors of this study were unable to adjust for maternal obesity or smoking, both known to be associated with morbidity.^{2 3} Similarly, they made no adjustments for maternal morbidities beyond chronic hypertension and pre-eclampsia. Many pre-existing medical conditions are known to be associated with severe maternal morbidity.⁴ There is thus a significant likelihood that the women giving birth at night are different to those giving birth during the day in ways unaccounted for by this study.

Another challenge in using routine data concerns the time variable used. Time of birth was used in this study. However, the events underlying the eventual outcomes are likely to occur at a time remote from the actual time of delivery. The staffing in place overnight at the time of delivery has little relevance when the underlying cause of the severe morbidity was a disease process and/or management which began hours or even days beforehand. Future studies need to investigate the timing and underlying causes of morbidity to gain further insight as to whether there is true 'night-time effect'.

What this study does tell us is that the women giving birth overnight are more likely to have a severe morbidity than those giving birth during the day and that women giving birth during the day are more likely to have a pelvic floor morbidity. In the light of other studies that have shown that basic observations are not always undertaken,⁵ and with the knowledge, from this study, of which morbidities are more likely to occur during the day and at night, this study highlights the importance of regular observations to detect and manage morbidities early.

Competing interests None declared.

Provenance and peer review Commissioned; internally peer reviewed.

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