

Revisiting the use of the electronic fetal monitor

The Lancet, Volume 361, Number 9356, 08 February 2003

The Lancet 2003; 361:445-446

DOI:10.1016/S0140-6736(03)12465-8

[Stephen B Thacker](mailto:sbt1@cdc.gov) <mailto:sbt1@cdc.gov> [cor1cor1](#)

and [Donna F Stroup](#) [b](#)

Concerns about the efficacy and safety of routine electronic fetal monitoring in labour have led expert panels in the USA and Canada^{1,2} to recommend that such monitoring be limited to high-risk pregnancies. The latest systematic review supports that concern;³ yet, the use of electronic fetal monitoring in low-risk pregnancies continues to expand globally.

The identification of high-risk pregnancies that would benefit from the use of electronic fetal monitoring during labour remains an important research issue. In this issue of *The Lancet*, Lawrence Impey and colleagues report the results of a randomised controlled trial that assessed the efficacy of admission cardiotocography for 8580 low-risk women in labour as measured by reductions in the rate of neonatal and maternal morbidity and mortality. Like the 1985 trial from the same institution that assessed the efficacy of intrapartum fetal monitoring,⁴ this study is carefully designed and well conducted.

Taken together with similar findings from the only other reported trial of this intervention,⁵ the conclusion that routine use of cardiotocography for 20 min on admission to the delivery ward does not improve neonatal outcome is reasonable.

Several aspects of the Impey report deserve comment. The investigators were very careful in the implementation of their trial. Randomisation of women to the treatment or control group was blinded and statistically based. The authors used an appropriate intention-to-treat analysis and prespecified any subgroup analyses. Non-parametric methods were used appropriately when data failed to satisfy Gaussian assumptions. The analysis examined the effect of changing the method of randomisation during the trial. One concern about the study design is that the power calculation assumed a 50% reduction in risk, whereas practitioners might find a 25% reduction clinically meaningful. This issue, along with difficulties in generalising to other populations from two trials (the Impey study and Mires et al⁵) done in populations at similar risk, may mean that further trials are still warranted. The finding that there was no increase in caesarean delivery rate, for example, could relate to a low rate of caesarean delivery at this hospital compared with other institutions. The study by Impey and colleagues provides no evidence that the routine use of cardiotocography for 20 min on admission is effective for identifying pregnancies that will benefit from electronic fetal monitoring in labour, but additional trials, particularly among high-risk populations, might allow a meta-analysis so that as much could be known about the value of admission cardiotocography as about EFM during labour.³

It is important to explore new and better uses of technologies in medicine. However, technology must not be allowed to diffuse unchecked. The use of electronic fetal monitoring in low-risk pregnancies is of limited effectiveness and carries an increased risk of interventions including

instrumental delivery, caesarean delivery, augmentation of labour, and epidural anaesthesia.³ The lessons learnt too slowly from the experience with electronic fetal monitoring are relevant for admission cardiotocography.⁶ Increased information on admission will not necessarily lead to better clinical outcomes. New technologies must be evaluated before their widespread implementation and randomised trials are critical to a valid assessment of a screening technology such as admission cardiotocography. Even the best trials have limitations, if only in generalisability. Sometimes the best studies are done in settings that are not readily transferable to other places because of differences in resources or characteristics of the study population. Systematic reviews and cumulative meta-analyses can help to address the limitations of single trials.

The extent of use of admission cardiotocography is not well documented, but widespread use of admission cardiotocography should be discouraged until better evidence from randomised trials that examine efficacy and safety in populations that are likely to benefit, is available.

References

1. United States Preventive Services Task Force. In: Screening for fetal distress with intrapartum electronic fetal monitoring: guide to clinical preventive services. An assessment of the effectiveness of 169 interventions. Baltimore: Williams and Wilkins, 1989: 233-238.
2. The Canadian Task Force on the Periodic Health Examination. The Canadian guide to clinical preventive health care (Health Canada). Ottawa: Canada Communications Group, 1994:.
3. Thacker SB, Stroup D, Chang M. Continuous electronic heart rate monitoring for fetal assessment during labor (Cochrane Review)*The Cochrane Library*, issue 4. Oxford: Update Software, 2001:.
4. MacDonald D, Grant A, Sheridan-Pereira M, Boylan P, Chalmers I. The Dublin randomized controlled trial of intrapartum fetal heart rate monitoring. *Am J Obstet Gynecol* 1985; 152: 524-539. [MEDLINE](#)
5. Mires G, Williams F, Howie P. Randomised controlled trial of cardiotocography versus Doppler auscultation of the fetal heart at admission in labour in a low risk obstetric population. *BMJ* 2001; 322: 1457-1462. **Error! Hyperlink reference not valid.**
6. Thacker SB. Lessons in technology diffusion: the electronic fetal monitoring experience. *Birth* 1997; 24: 58-60.