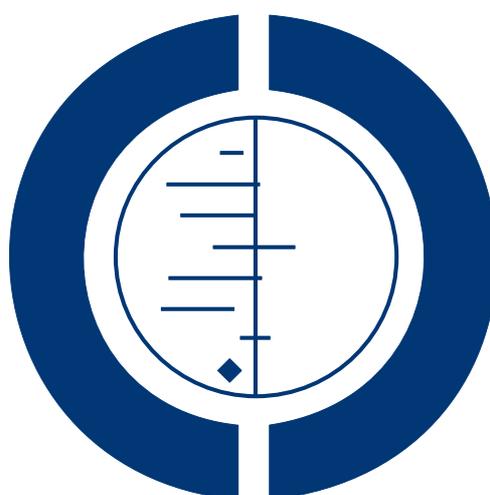


Fetal electrocardiogram (ECG) for fetal monitoring during labour (Review)

Neilson JP



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[Intervention Review]

Fetal electrocardiogram (ECG) for fetal monitoring during labour

James P Neilson¹

¹Department of Women's and Children's Health, The University of Liverpool, Liverpool, UK

Contact address: James P Neilson, Department of Women's and Children's Health, The University of Liverpool, First Floor, Liverpool Women's NHS Foundation Trust, Crown Street, Liverpool, L8 7SS, UK. jneilson@liverpool.ac.uk.

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ABSTRACT

Background

Hypoxaemia during labour can alter the shape of the fetal electrocardiogram (ECG) waveform, notably the relation of the PR to RR intervals, and elevation or depression of the ST segment. Technical systems have therefore been developed to monitor the fetal ECG during labour as an adjunct to continuous electronic fetal heart rate monitoring with the aim of improving fetal outcome and minimising unnecessary obstetric interference.

Objectives

To compare the effects of analysis of fetal ECG waveforms during labour with alternative methods of fetal monitoring.

Search methods

The Cochrane Pregnancy and Childbirth Group's Trials Register (28 February 2012).

Selection criteria

Randomised trials comparing fetal ECG waveform analysis with alternative methods of fetal monitoring during labour.

Data collection and analysis

Trial quality assessment and data extraction were performed by one review author, without blinding.

Main results

Six trials (16,295 women) were included: five trials of ST waveform analysis (15,338 women) and one trial of PR interval analysis (957 women). In comparison to continuous electronic fetal heart rate monitoring alone, the use of adjunctive ST waveform analysis made no significant difference to primary outcomes: births by caesarean section (risk ratio (RR) 0.99, 95% confidence interval (CI) 0.91 to 1.08), the number of babies with severe metabolic acidosis at birth (cord arterial pH less than 7.05 and base deficit greater than 12 mmol/L) (RR 0.78, 95% CI 0.44 to 1.37, data from 14,574 babies), or babies with neonatal encephalopathy (RR 0.54, 95% CI 0.24 to 1.25). There were, however, on average fewer fetal scalp samples taken during labour (RR 0.61, 95% CI 0.41 to 0.91) although the findings were heterogeneous; there were fewer operative vaginal deliveries (RR 0.90, 95% CI 0.81 to 0.98) and admissions to special care unit (RR 0.89, 95% CI 0.81 to 0.99); there was no statistically significant difference in the number of babies with low Apgar scores at five minutes or babies requiring neonatal intubation. There was little evidence that monitoring by PR interval analysis conveyed any benefit.

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Authors' conclusions

These findings provide some modest support for the use of fetal ST waveform analysis when a decision has been made to undertake continuous electronic fetal heart rate monitoring during labour. However, the advantages need to be considered along with the disadvantages of needing to use an internal scalp electrode, after membrane rupture, for ECG waveform recordings.

PLAIN LANGUAGE SUMMARY

Fetal electrocardiogram (ECG) for fetal monitoring during labour

Monitoring the baby's heart using electrocardiography (ECG) plus cardiotocography (CTG) during labour provides some modest help for mothers and babies when continuous monitoring is needed.

Strong uterine contractions during labour reduce the flow of maternal blood to the placenta. The umbilical cord may also be compressed during labour, especially if the membranes are ruptured. Usually the baby has sufficient reserve to withstand this effect but some may become distressed. Electronic heart monitoring may be suggested if the doctors think the baby is not getting enough oxygen during labour. Two different methods may be used. CTG measures the baby's heart rate together with the mother's uterine contractions. An ECG measures the heart's electrical activity and the pattern of the heart beats. This involves an electrode being passed through the woman's cervix and attached to the baby's head. This review of six randomised controlled trials, including a total of 16,295 women, found that monitoring the baby using ECG plus CTG resulted in fewer blood samples needing to be taken from the baby's scalp, and less surgical assistance with the birth, than with CTG alone. There was no difference in the number of caesarean deliveries and little to suggest that babies were in better condition at birth.