

Cardiotocography only versus cardiotocography plus ST analysis of fetal electrocardiogram for intrapartum fetal monitoring: a Swedish randomised controlled trial.

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BACKGROUND: Previous studies indicate that analysis of the ST waveform of the fetal electrocardiogram provides information on the fetal response to hypoxia. We did a multicentre randomised controlled trial to test the hypothesis that intrapartum monitoring with cardiotocography combined with automatic ST-waveform analysis results in an improved perinatal outcome compared with cardiotocography alone.

METHODS: At three Swedish labour wards, 4966 women with term fetuses in the cephalic presentation entered the trial during labour after a clinical decision had been made to apply a fetal scalp electrode for internal cardiotocography. They were randomly assigned monitoring with cardiotocography plus ST analysis (CTG+ST group) or cardiotocography only (CTG group). The main outcome measure was rate of umbilical-artery metabolic acidosis (pH <7.05 and base deficit >12 mmol/L). Secondary outcomes included operative delivery for fetal distress. Results were first analysed according to intention to treat, and secondly after exclusion of cases with severe malformations or with inadequate monitoring.

FINDINGS: The CTG+ST group showed significantly lower rates of umbilical-artery metabolic acidosis than the cardiotocography group (15 of 2159 [0.7%] vs 31 of 2079 [2%], relative risk 0.47 [95% CI 0.25-0.86], p=0.02) and of operative delivery for fetal distress (193 of 2519 [8%] vs 227 of 2447 [9%], 0.83 [0.69-0.99], p=0.047) when all cases were included according to intention to treat. The differences were more pronounced after exclusion of 291 in the CTG+ST group and 283 in the CTG group with malformations or inadequate recording.

INTERPRETATION: Intrapartum monitoring with cardiotocography combined with automatic ST-waveform analysis increases the ability of obstetricians to identify fetal

hypoxia and to intervene more appropriately, resulting in an improved perinatal outcome.