



## **Cardiotocography alone is outdated and ST analysis is the way forward in fetal monitoring**

*FOR: Does the use of ST analysis in conjunction with cardiotocography improve perinatal outcome and/or reduce interventions for fetal distress?*

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Well, according to European randomised controlled trials (RCTs) the answer should be – at least partly – yes: there is a lower rate of instrumental deliveries and lower need for fetal blood sampling, whereas several meta-analyses are inconclusive regarding the effect on umbilical artery metabolic acidosis (Olofsson et al. *Acta Obstet Gynecol Scand* 2014;93:571–86). A recent large RCT in the USA did not show any differences between the ST arm and the conventionally monitored arm of the trial, however (Belfort et al. *NEJM* 2015;373:632–41). Differences between the US trial and the European trials include a three-tier instead of a four-tier cardiotocography (CTG) classification and an ST-action system, absence of fetal scalp sampling, and a very low institutional recruitment rate, despite the overall large size of the trial (on average nine inclusions per hospital per month, in contrast with 15–135 in the five European trials). The low inclusion rate of only two per week in large hospitals with many obstetricians and midwives working in the labour ward may have hampered adequate exposure to the new monitoring technique. Data from the European trials has shown that

results in favour of ST analysis were more pronounced in the second half of the trials, which suggests a continuing learning process (Schuit *AJOG* 2013;209:394–5). Moreover, longitudinal data from several hospitals has shown that after the introduction of ST technology metabolic acidosis at birth fell over the course of several years by 50–75%, without an increase in instrumental deliveries (Visser et al. *Acta Obstet Gynecol Scand* 2014;93:539–43).

The latter data suggest that an introduction of ST analysis in the labour ward may have resulted in a considerably better outcome than could have been expected from the results of the trials. The introduction of the new device may have resulted in more attention towards CTG interpretation, especially as structured CTG classification and training are essential parts of the ST package. The much better outcome in the conventional arm of the Dutch RCT than was expected from earlier data may also point towards an improved CTG interpretation (i.e. the 'Hawthorne effect'). Finally, the automatic detection and depiction of (significant) ST changes forces the clinician to assess

the CTG pattern and ST events to take action or otherwise. In other words, in the case of a possible deterioration of the fetal condition the clinician is obliged to make a documented decision. From medical legal cases it is known that inadequate fetal monitoring is the main factor leading to financial compensation.

The Royal College of Obstetricians and Gynaecologists (RCOG) project 'Each baby counts' is currently reviewing cases that resulted in a poor fetal outcome during labour. It is our opinion that the prevention of poor intrapartum outcomes will primarily be achieved by prioritising the 24/7 presence of experienced clinicians, case discussions, and continuous training on the labour ward. And what about ST technology? We think it is likely to be of additional help, mainly because it requires structured CTG assessment and decision-making, with some additional benefits of the technology itself.

### **Disclosure of interests**

None declared. Completed disclosure of interests form available to view online as supporting information. ■