

## **Fetal scalp pH and ST analysis of the fetal ECG as an adjunct to CTG. A multi-center, observational study.**

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**OBJECTIVE:** To evaluate the relationships between scalp-pH and CTG plus ST waveform analysis of the fetal ECG (STAN) clinical guidelines as indicators of intrapartum hypoxia in term fetuses born with cord artery acidemia. **STUDY DESIGN:** Data from 6999 term deliveries monitored by the STAN (R) S 21 as part of an EU multi-center study on clinical implementation of the STAN methodology for intrapartum fetal surveillance were analyzed. We identified 911 cases where a scalp-pH was obtained, including 53 cases with cord artery acidemia (pH < 7.06). Lag times between ST events and scalp-pH and time to delivery were related to cord artery metabolic and respiratory acidosis and neonatal outcome. **RESULTS:** 43 fetuses were identified by CTG plus ST as being in need of intervention 31 (25-46) minutes before delivery (median, 95% CI). In five, no indications were given and in another five there were inadequate data. Fifteen cases with metabolic acidosis required special neonatal care, all 14 cases adequately monitored on STAN had indications to intervene for 19 minutes or more. In 30 adequately recorded cases, fetal blood sampling (FBS) was obtained within the last hour of labor. In 22 cases, FBS was obtained 13 (7-24) minutes after STAN guidelines had indicated abnormality and in eight no ST changes had occurred at time of FBS. The corresponding FBS data were pH 7.10 (7.01-7.15) and pH 7.21 (7.08-7.31), respectively, P = 0.01. In cases of metabolic acidosis, scalp-pH fell 0.01 units per minute after a baseline T/QRS rise was recorded during the second stage of labor. Apart from one newborn that died at 2 h from E. Coli septicemia, none of the neonates were affected neurologically. **CONCLUSION:** Cardiotocography plus ST analysis provides accurate information about intrapartum hypoxia similar to that obtained by scalp-pH.