

Fetal scalp pH and ST analysis of the fetal ECG as an adjunct to cardiotocography to predict fetal acidosis in labor-a multi-center, case controlled study.

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OBJECTIVE: To assess the relationship between scalp pH (FBS) and ST analysis in situations of acidosis with special emphasis on the timing of cardiotocography (CTG), FBS and ST changes during labor.

STUDY DESIGN: From a European Union multicenter study on clinical implementation of the STAN methodology, 911 cases were identified where a scalp-pH had been obtained. In 53 cases, marked cord artery acidosis was found (cord artery pH<7.06) and 44 cases showed moderate acidemia at birth (pH 7.06-7.09). Comparisons were made with 97 control cases (pH \geq 7.20).

RESULTS: Of those cases with FHR+ST events recorded within 16 min of delivery, 61% (17/28) had a cord artery pH \geq 7.20. The corresponding figure for cases where STAN indications occurred for more than 16 min was 19% (13/69) (OR 6.66, 2.53-17.55, P<0.001). Out of the 121 cases with an abnormal CTG, 84 (69%) showed a cord artery pH of <7.10. STAN indicated abnormality in 83% (70 out of 84). The corresponding figure for scalp pH<7.20 was 43% (36/84). In the case of CTG changes at the start of an adequate recording STAN guidelines provided information on developing acidosis in all cases but one (16 out of 17) in the marked acidosis group. STAN guidelines indicated abnormality prior to an abnormal FBS in 14 out of 17 cases. The median duration between STAN indications to intervention and an abnormal FBS was 29 (95% CI 11-74) min.

CONCLUSIONS: ST analysis, as an adjunct to CTG, identifies adverse fetal conditions during labor similar to that of FBS but on a more consistent basis. The timing of CTG+ST changes relates to the level of acidosis at birth.