

# Fetal electrocardiographic monitoring during labor in relation to cord blood levels of the brain-injury marker protein S-100.

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**BACKGROUND:** Cord artery protein S-100 levels at birth are potential markers of brain damage after asphyxia. Our aim was to investigate if S-100 levels were elevated in neonates with indirect signs of asphyxia during birth. S-100 levels in cord blood were studied in relation to cardiotocography (CTG) and fetal electrocardiography (FECG) changes during birth and to acidemia in umbilical blood.

**MATERIAL AND METHODS:** This case-control study was performed in parallel to a large randomized controlled trial (RCT) studying FECG at birth. Protein S-100 samples were collected from 103 neonates at birth and related to the CTG and ECG changes during labor and to pH in umbilical blood.

**RESULTS:** Protein S-100 was significantly higher in neonates with umbilical artery blood  $\text{pH} \leq 7.05$ , compared to neonates with  $\text{pH} > 7.05$ . Furthermore, neonates with preterminal CTG patterns showed increased S-100 levels compared to neonates with normal CTG. Neonates having significant CTG and ECG changes, leading to intervention according to clinical guidelines, showed significantly higher S-100 levels compared to neonates without such indication of intervention.

**CONCLUSION:** A relation exists between S-100 in umbilical blood at birth, acidosis and pathological patterns in CTG and FECG during labor.