

Different types of acid-base changes at birth, fetal heart rate patterns, and infant outcome at 4 years of age.

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Abstract

BACKGROUND: To study the relationship between different types of acidemia in umbilical artery blood at birth, fetal heart rate (FHR) patterns during labor, and infant long-term outcome.

METHODS: Case-control study of 48 infants with pure high base deficit (base deficit (BD) $>$ or $=$ 12 mmol/L and $p\text{CO}_2 < 8.0$ kPa), 51 with mixed acidemia (BD $>$ or $=$ 12 mmol/L and $p\text{CO}_2 >$ or $= 8.0$ kPa), born at or after term, and controls matched for maternal age, parity, and gestational age at birth. FHR patterns during labor and the results of developmental screening at age 4 were compared between the groups.

RESULTS: Late decelerations were associated with pure high base deficit and complicated variable decelerations with mixed acidemia. Both types of acidemia were correlated with Apgar scores below 7 at 1 minute, and mixed acidemia with more admissions to the neonatal intensive care unit. Developmental screening at age 4 years showed no significant differences between infants with mixed acidemia or pure high base deficit and controls. Twelve infants with mixed acidemia and six controls had deficits in language/speech development.

CONCLUSIONS: Late decelerations may be an indicator of a metabolic component of acidemia and complicated variable decelerations an indicator of mixed acidemia. The higher rate of admissions to the neonatal intensive care unit in cases with mixed acidemia may suggest that a concomitant hypercapnia (resulting in lower pH) in metabolic acidemia at birth may be of importance for the outcome. A possible relation between acidemia at birth and deficits in speech/language development should be further evaluated.