

NEURODEVELOPMENT

Outcomes of extremely low birthweight infants with acidosis at birth

Background

Accurate prediction of death or neurodevelopmental impairment (NDI) in preterm infants based on early clinical information would be invaluable for counseling parents and making clinical decisions to continue or withhold intensive care support. Severe acidosis at birth is one of the strongest predictors of death/NDI in full-term infants with suspected hypoxic ischemic encephalopathy.

David Randolph and colleagues examined the hypothesis that perinatal acidosis is associated with the combined outcome of death/NDI in preterm infants < 1000g (ELBW).

Summary of results

The study population consisted of ELBW infants born between 2002 and 2007 at National Institute of Child Health and Development (NICHD) Neonatal Research Network hospitals. Infants with cord blood gas data and documentation of either mortality prior to discharge or 18–22 months neurodevelopmental outcomes were included.

3979 patients were identified of whom 249 had a cord gas pH<7 or BE<-12 mEq/L. 2124 patients (53%) had the primary outcome of death/NDI. After adjustment for confounding variables, pH<7 and BE<12 mEq/L were each significantly associated with death/NDI (OR=2.5, 1.6-4.2 and OR=1.5, 1.1-2.0). However, inclusion of pH or BE did not improve the ability of the multivariable model to predict death/NDI.

Strength

Randolph and colleagues included multiple sites with diverse patient populations and standardized data collection and follow-up. This is by far the largest study of its kind with enough subjects to analyse multiple secondary outcomes and to account for multiple confounding variables.

Limitations

One limitation is the large number of infants with missing cord blood gas data. Frequency of cord blood gas collection varied between sites from 0% to 82%. A second limitation is the use of Bayley III in the last years of the study, which has been reported to underestimate disability.

Practical conclusion

A cord blood pH<7 or BE<-12 was found in 6% of extremely low birthweight infants. Perinatal acidosis was significantly associated with death or NDI, but other factors are likely more important in predicting long-term outcomes.

David A Randolph et al., "Outcomes of Extremely Low Birthweight Infants with Acidosis at Birth". Arch Dis Child Fetal Neonatal Ed (February 19, 2014), doi:10.1136/archdischild-2013-304179

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