

N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE AND PATENT DUCTUS ARTERIOSUS IN PRETERM INFANTS

Submitted by Pracha Nuntnarumit

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INTRODUCTION: N-terminal pro-brain natriuretic peptide (NT-proBNP) in adults has been reported to be a diagnostic marker of ventricular enlargement and volume overload. However, clinical studies using NT-proBNP in premature infants have been very limited.

OBJECTIVE: We sought to determine whether plasma NT-proBNP in premature infants can identify hemodynamically significant patent ductus arteriosus (hsPDA) and determine the correlation between serial plasma NT-proBNP level and echocardiographic assessment of PDA.

METHODS: Thirty-nine preterm infants underwent clinical and echocardiographic examinations for PDA on days-of-life 2, 4, and 7 and simultaneous blood sampling to measure plasma NT-proBNP concentrations. When ≥ 2 clinical features of PDA were detected along with left-to-right ductal shunting demonstrated by echocardiogram, hsPDA was diagnosed and the patient treated with indomethacin or ibuprofen.

RESULTS: On day 2, the mean NT-proBNP concentration in the hsPDA group ($n = 12$) was significantly higher than that in the non-hsPDA group ($n = 23$) (3160.3 ± 3104.9 vs 618.1 ± 490.7 pmol/L; $P \leq .05$). Eight infants (72%) in the hsPDA group became asymptomatic after an initial course of indomethacin or ibuprofen, and their NT-proBNP levels concomitantly declined. NT-proBNP concentrations were significantly correlated with the magnitudes of the ductal shunt, such as left-atrium/aorta ratio and left-atrium volume index ($r = 0.753$ and 0.596 , respectively). The cutoff of NT-proBNP concentration at 1204 pmol/L on day 2 gave the best predictive values for hsPDA with 100% sensitivity, 91% specificity, 86.7% positive predictive value, 100% negative predictive value, and a likelihood ratio of 11.5.

CONCLUSIONS: The plasma NT-proBNP level on day-of-life 2 is a sensitive marker for predicting hsPDA in preterm infants. Successful closure of PDA corresponds with a decline in plasma levels of NT-proBNP.

PREDICTIVE VALUE OF AMPLITUDE-INTEGRATED ELECTROENCEPHALOGRAPHY ON OUTCOME IN NEONATAL EXTRACORPOREAL MEMBRANE OXYGENATION

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INTRODUCTION: The early and accurate assessment of cerebral function in neonates who undergo extracorporeal membrane oxygenation (ECMO) may identify high-risk infants who are amenable to neuroprotective strategies or, at least, in need of more detailed neuroimaging and neurodevelopmental follow-up.

OBJECTIVE: The specific aims of this study were to assess the clinical utility and long-term predictive value of amplitude-integrated electroencephalography (aEEG) in neonatal ECMO.

METHODS: Thirty-four infants who required ECMO for respiratory failure were enrolled in the study prospectively. Serial aEEGs were recorded before, during, and after ECMO and classified by 2 independent interpreters on the basis of background pattern and amplitude criteria. Surviving infants were followed up to 18 to 22 months and assessed with a structured neurologic examination and formal developmental testing by using the Bayley Scales of Infant Development II. The primary outcome was death or neurodevelopmental impairment (defined as moderate-to-severe cerebral palsy and/or a Mental Developmental Index or Psychomotor Development Index score of <70).

RESULTS: Preliminary data analysis on the first 20 patients was performed. Thirteen patients survived, 3 died while on ECMO, and 4 died before discharge. All surviving infants were evaluated at follow-up. A severely abnormal aEEG predicted death or moderate-to-severe neurodevelopmental impairment with a sensitivity of 0.85 (95% confidence interval [CI]: 0.70–0.95), a specificity of 0.57 (95% CI: 0.3–0.76), a positive predictive value of 0.79 (95% CI: 0.65–0.88), and a negative predictive value of 0.67 (95% CI: 0.35–0.88).

CONCLUSIONS: aEEG is a useful neuromonitoring tool during neonatal ECMO.

FREEDOM OF BREATH, FOUNDATION OF LIFE

Submitted by Hongmao Ye

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Perinatal asphyxia is the leading cause of neonatal mortality, cerebral palsy, and mental retardation worldwide and accounts for ~ 1 million of the 4 million neonatal deaths that occur each year (World Health Organization, 2005). According to China's national maternal and children's health surveillance in 2005, neonatal mortality was 19 per 1000 live births. In China, the first top 3 causes of infant mortality are preterm birth and low

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