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NT-proBNP Changes for Diagnosing Hemodynamically Significant Patent Ductus Arteriosus in Neonates at ≥35 Weeks Gestation

Khatuna Lomauri, Eliso Turkadze

Department of Neonatology, the First University Clinic, Tbilisi State Medical University, Tbilisi, Georgia

Hemodynamically significant patent ductus arteriosus (PDA) is a major cause of neonatal morbidity. Its incidence is inversely proportional to gestational age; however, in a proportion of term and late preterm neonates, it remains clinically significant and may require hospitalization. Early identification and assessment of ductal hemodynamic significance are essential for optimal management and outcomes. N-terminal B-type natriuretic peptide (NT-proBNP) is a sensitive biomarker of cardiac function, reflecting left ventricular stroke volume and pulmonary blood flow, both of which are impaired in the presence of hemodynamically significant PDA. Objective: To evaluate the prognostic value of NT-proBNP in diagnosing hemodynamically significant PDA (hsPDA) in neonates with a gestational age of ≥35 weeks, and to determine its role as an adjunct marker for assessing the severity, progression, and treatment response in PDA-associated cardiac dysfunction.

Methods: This prospective study will include neonates ≥35 weeks of gestation. Venous blood samples will be collected within 48–72 hours of life to determine NT-proBNP levels. Echocardiographic parameters—including PDA diameter, left atrium-to-aorta (LA/Ao) ratio, and left ventricular output-to-superior vena cava (LVO/SVC) index—will be evaluated to correlate NT-proBNP concentrations with ductal hemodynamic significance. Data will be analyzed using appropriate statistical methods for both prospective and retrospective comparisons.

Results: Preliminary findings indicate that mean NT-proBNP levels are significantly higher in neonates with hemodynamically significant PDA. The biomarker demonstrates high sensitivity and specificity in predicting hsPDA, supporting its diagnostic and prognostic value in neonatal cardiac assessment.

Conclusion: NT-proBNP serves as a reliable biomarker for identifying and monitoring hemodynamically significant PDA in neonates. Its application can aid clinicians in assessing disease prognosis, guiding treatment decisions, and evaluating the effectiveness of conservative management. A declining NT-proBNP trend correlates with spontaneous ductal closure, offering a valuable tool for noninvasive monitoring.

Keywords: NT-proBNP, patent ductus arteriosus, hemodynamics, neonate, prognosis.