Perfusion Index Variability and N-Terminal Pro-Brain Natriuretic Peptide Levels Before and After Cardiac Interventions in Congenital Heart Disease

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Background and Aims

Congenital heart diseases (CHD) are the most common life-threatening anomalies with significant morbidity and mortality in newborns. The aim of this study was to evaluate perfusion index variability (PI) and pro-Brain Natriuretic Peptide (NT-proBNP) levels before and after cardiac interventions.

Methods

A prospective study was performed on hospitalized newborns diagnosed with CHD. Oxygen saturation (SaO2), PI, heart rate and serum NT-proBNP levels were obtained before and 6th hour after cardiac interventions (catheterization or surgery) in all patients, by using Masimo Rainbow SET Radical-7 Monitor (Masimo Corp., Irvine, CA, USA). Duration of mechanical ventilation, morbidity and mortality rates were documented.

Results

Thirty-four CHD diagnosed newborns were included. Pulmonary atresia (20.6%), aortic coarctation (14.7%), and transposition of great arteries (11.82%) are the most common diagnoses. Median (IQR) birth weight and gestational age were 3250g (2450–4300) and 38weeks (38–42) respectively. Fifty-eight percent of newborns were male. Rapidly rising of oxygen saturations and PI values after cardiac interventions were observed in all patients (SaO2 %, before: 79±6.6, after: 87.9±2.9, p=0.001) (PI before: 0.4±0.1, after: 1.1±0.2, p=0.001). A significant decrease in NT-proBNP levels (pg/mL) were seen after therapeutic interventions too(before: 1547±629, after: 911±262, p=0.001). Six patients (17.6%) required surgical intervention. The median (IQR) day of mechanical ventilation was 7days (2–21). Proven sepsis (n=8.23%), chronic lung disease (n=5.14%), pulmonary hemorrhage (n=4,%11), and pneumothorax(n=3.8%) are the most detected complications. Mortality rate was 20% (n=5).

Conclusion

Peripheral tissues are sensitive to alterations in perfusion. PI monitoring of these tissues could be an early marker of hypoperfusion. PI has significantly improved in correlation with SpO2 after therapeutic interventions. Assessment of PI and NT-proBNP values could be used by monitoring peripheral tissues in critically ill newborns with CHD.