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CARDIAC OUTPUT MONITORING IN CHILDREN BY BIOREACTANCE; A NEW METHOD FOR NONINVASIVE CARDIAC OUTPUT MEASUREMENT

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Introduction: Bioreactance, the analysis of intrabeat variations in response to high frequency transthoracic current, is a new method for noninvasive cardiac output measurement (NICOM). The objective of this study was to evaluate the cardiac index (CI) by bioreactance in children without hemodynamic alterations.

Methods: We performed a prospective, observational study in 10 patients with age range between 1 month to 12 years and weight from 4 to 30 Kg. The heart rate (HR), mean arterial pressure (MAP) and CI by bioreactance were analyzed every 6-8 hours.

Results: 34 measurements were made. The mean CI was 2.4 ± 1.03 ml/min/1.73 m² (range 1 to 4.9 ml/min/1.73 m²). 52% of the measurements were lower than 2.5 L/min/1.73 m². A significant correlation was found between CI and age ($r = 0.50$, $p = 0.003$), weight ($r = 0.66$, $p < 0.001$) and MAP ($r = 0.369$, $p = 0.037$). Significant differences were found when comparing CI in children whose weight was < 10 kg: 1.9 ± 0.73 ml/min/1.73 m² (range 1 to 3.2 ml/min/1.73 m²), 10 and 20 kg: 2.07 ± 0.7 ml/min/1.73 m² (range 1 to 3.6 ml/min/1.73 m²) and > 20 kg: 3.7 ± 0.8 ml/min/1.73 m² (range 2.4 to 4.9 ml/min/1.73 m²) ($p < 0.001$).

Conclusion: In children CI values by bioreactance change with patient's age and weight. In a large percentage of measurements these might be lower than normal range. These data suggests that this method may not be useful to measure CI in small children.

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N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE LEVELS AND ITS RELATION WITH THE PATENT DUCTUS ARTERIOSUS IN PREMATURE NEONATES

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Introduction: Early and definitive detection of PDA is possible with echocardiography, but it is not practical for screening all the premature babies. The purpose of this study is evaluating the relationship with the NT- proBNP and PDA in premature babies.

Patients and method: 43 prematures, gestational ages between 27-36 weeks, >750 g, within the first 48 hours enrolled the study. Echocardiography performed with/without clinical signs of PDA and first blood samples for pro-BNP (proBNP 0) were obtained. Echocardiography repeated at 5th, 15th and 30th days if it had been determined open duct. The second blood samples for pro-BNP (proBNP 5) were obtained at 5th day. Mean ages of prematures were 28.8 ± 10.0 hours, gestational ages were 31.3 ± 2.3 weeks, mean weights were 1531.2 ± 389.1 gram. We found open duct in 19 (44.2%) babies during first echo, in 9 (20.9%) babies on 5th day echo. On the 15th day, 5 ducts were patent. On 30th day, 3 ducts were open.

Results: Mean proBNP 0 were significantly different between open duct (13893.8 ± 12048.1 pg/mL) vs closed duct (6132 ± 3913.8 pg/mL) ($P < 0.005$). We found that mean proBNP 5 level was significantly different in open duct babies vs closed duct babies (8407.4 ± 11029.9 pg/mL vs. 1789.2 ± 1724.4 pg/mL, $P < 0.005$). There was negative correlation between proBNP 0 levels and gestational age ($r = -0.32$), proBNP 0 levels and weight ($r = -0.31$)

Conclusion: The proBNP predictivity of the outcome in PDA in prematures is insufficient.