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# PATENT DUCTUS ARTERIOSUS – HOW RELEVANT ARE BIOMARKERS FOR THE DIAGNOSIS?

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In contrast to clinical signs echocardiography allows us to identify a PDA early and to monitor treatment. Nevertheless, despite several echocardiographic parameters of proved accuracy a "gold standard" for judgement of the haemodynamic severity of a PDA that targets treatment more effectively has not been established. Therefore, during daily routine most neonatologists look at more than one criteria before making the decision to treat a PDA, but again the chosen combination of parameters might not be evidence based. The determination of cardiac biomarkers can provide additional information on the haemodynamic severity of the ductal shunt, thereby potentially facilitating decision making in PDA treatment. A measure for cardiac stress induced by a PDA is the increasing release of the natriuretic peptides ANP (atrial natriuretic peptide) and BNP (brain-type natriuretic peptide). BNP is predominantly produced in the ventricle due to volume overload by stretching of the cardiac myocytes as a direct measure for the physiologic cardiac response to haemodynamic stress. BNP itself is characterized by a very short half-life. Instead, the N-terminal fragment of pro BNP (NT-proBNP) can be determined in serum. Several studies have demonstrated, that in comparison to echocardiography BNP and NT-proBNP are reliable parameters with high sensitivity and specificity for early prediction ($2^{nd}$ – $3^{rd}$ day of life) of a PDA that becomes haemodynamically significant later.[1, 2] The cut-off for BNP-plasma levels to predict a PDA warranting treatment is > 550 pg/ml on the $2^{nd}$ day of life in ventilated preterm infants < 28 weeks gestational age (sensitivity 83%, specificity 86%).[3] In preterm infants with a gestational age between 25 and 34 weeks a plasma BNP level of 1110 pg/ml on the $3^{rd}$ day of life (sensitivity 100%, specificity 95,3%) has been shown to reliably predict a significant PDA.[1] The cut-off for plasma NT-proBNP to predict a PDA that becomes haemodynamically significant later is 10180 pg/ml on the $2^{nd}$ day of life in preterm infants < 33 weeks gestational age (sensitivity 100%, specificity 91%) and 11395 pg/ml on the $3^{rd}$ day of life (sensitivity 100%, specificity 95%).[4, 5] Besides the natriuretic peptides determination of cardiac Troponin T (cTNT) seems also a potential screening parameter of PDA diagnosis, although currently only one study has been published.[6]
Further longitudinal studies on the change of biomarkers in parallel with echocardiographic parameters might be especially useful for the further decision making in patients in whom a first cycle of cyclo-oxygenase inhibitor treatment failed to close the PDA.

References

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