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Prognostic value of cardiac biomarkers in congenital heart defects is time-dependent: umbilical cord versus newborn blood

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Title: Prognostic value of cardiac biomarkers in congenital heart defects is time-dependent: umbilical cord versus newborn blood

Aim: To compare whether there is a difference in cardiac biomarkers according to umbilical cord and newborn peripheral venous blood source.

Methods: Newborns with prenatal diagnosis of CHD were admitted consecutively at a Neonatal Intensive Care Unit, between August 2012 and March 2015. Plasma levels of BNP, troponin I, myoglobin and CK-MB were measured in the cord blood and in the peripheral venous blood of the newborn and compared.

Results: The cardiac biomarkers were significantly higher in the newborn than in the cord blood sample in newborns with congenital heart defects. Median (P25-P75) plasma levels in the newborn peripheral venous blood vs. cord blood of BNP were 86.2 (59.9-960.8) vs. 29.6 pg/mL (14.9-60.2), $p=0.001$; CK-MB 8.2 (4.7-14.7) vs. 3.6 (2.9-4.7), $p=0.002$; troponin I 0.04 (0.01-0.06) vs. 0.01 (0.01-0.01), $p=0.001$ and myoglobin 104.7 (61.7-154.5) vs. 43.8 (32.9-55.6), $p<0.001$, respectively.

Conclusions: The cord blood has the advantage of being noninvasive when compared with the newborn blood. However, the cardiac biomarkers levels are time-dependent in CHD, and the higher values in the newborn blood may reflect the impact of the hemodynamic changes that occur in the transition from fetal to post-natal circulation.