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Does heart-type fatty acid-binding protein (H-FABP) predict clinical outcomes after pediatric cardiac surgery?

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Introduction:

Children undergoing cardiac surgery can suffer considerable morbidity and mortality, in spite of recent advances in peri-operative cardio-protection. Early identification of ischemia / reperfusion injury could help clinicians provide timely support and prevent prolonged intensive care unit (ICU) stay. We evaluated Heart-type Fatty Acid Binding Protein (H-FABP), a cardiac injury marker that is released almost immediately following myocardial injury, as a predictor of clinical outcome, and compared it with the commonly used bio-markers creatine kinase-myocardial band (CK-MB) and Troponin-I (both peaking 3-6 hours after injury), as well as with bypass time.

Methods:

This is a retrospective study of patient data from a blinded randomized, controlled trial (RCT) with sildenafil preconditioning aiming to reduce ischemia/reperfusion injury, aged 1- 16 years, undergoing open heart surgery for ventricular septal defect (VSD) closure. Patient data was pooled together for the current analysis as there was no difference between the sildenafil and placebo groups. We measured H-FABP, Troponin-I and CK-MB preoperatively and 1, 3 and 6 hours after aortic de-clamping in 32 patients. Area under the release curve was calculated for the injury markers. Spearman's Rho Correlations were calculated between laboratory and clinical parameters including inotropic support duration, aortic cross-clamp time, total bypass-time, ventilation-weaning-time and total ICU-stay. We considered Spearman's rho correlations 0-0.19: very weak, 0.2-0.39: weak, 0.4-0.59: moderate, 0.6-0.79: strong, 0.8-1: very strong. Patients' data are expressed as median (interquartile range Q1-Q3).

Results:

Age was 47 months (24-94), ACC time 30 minutes (26-36), bypass time 57 minutes (50-67), ventilation-weaning time 116 minutes (87-362), inotropy time 26 hours (20-38), ICU stay 38 hours (25-47), and pre-discharge LVEF 64% (60-66).

The correlations of H-FABP, CK-MB, Troponin-I and bypass time with clinical outcome measures were only weak-moderate. There were strong correlations between all three injury markers.

Conclusion:

The predictive value of H-FABP for clinical outcome is not stronger than that of CK-MB, Troponin-I or bypass times. H-FABP, CK-MB and Troponin-I are not clinically useful predictors of clinical outcomes in pediatric cardiac surgery.