Prognostic value of Troponin T/I in infants with hypoplastic left heart syndrome between stage I and II

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Introduction
The period between stage I and II procedure for treatment of hypoplastic left heart syndrome (HLHS) bears a high mortality and morbidity. Troponin T/I (Trop) is a well-recognized marker for myocardial damage. We sought to analyze the prognostic value of Trop for predicting outcome in infants with HLHS.

Methods
Retrospective analysis of 70 infants treated for HLHS at our institution between March 2001 and October 2014. Stage I procedure consisted of Norwood-operation in 35 (50%) and Hybrid-approach in 22 (31%) patients and was performed at a median age of 6 days (range 0-52). Palliative care was chosen for 13 (19%) patients. All available Trop values up to stage II were collected from clinical charts and were analyzed in relation to the overall outcome of the children.

Results
Trop was significantly higher after Norwood-operation in comparison to Hybrid-approach (median 7.1 μg/l (0.7-20.9), vs. 1.2 μg/l (0.3-17.9), p 0.0003).
Overall mortality of the treated patients was 39% (22 patients). Survival was 54% (19 patients) in the Norwood and 73% (16 patients) in the Hybrid-approach group. Independently from the procedure used, maximal Trop and initial lactate levels were significantly higher in non-survivors than in survivors, with median Trop of 9 μg/l (0.6-18.8) vs. 3.4 μg/l (0.4-20.9), p 0.007, and median lactate of 3.7 mmol/L (1.6-25) vs. 2.9 mmol/L (0.3-14.6), p 0.03. Reinterventions between stage I and II were required in 17 (30%) patients, including 4 (11%) after Norwood and 13 (59%) after Hybrid procedure. No correlation was found between Trop levels and need for reinterventions.
Trop values were available during follow-up in the interstage period for 39 patients; Trop levels normalized in 5 (13%) patients, all survivors, while it remained elevated in all non-survivors.

Conclusions
In patients with HLHS Trop levels were significantly higher after Norwood procedure than after Hybrid-approach. Maximal Trop values were related to mortality.
During the interstage period normalization of Trop levels was infrequent, occurring in only 13% of the patients, all survivors. Trop levels did not correlate with the need for reinterventions.