Interleukin-6 as a marker of inflammatory related post-operative myocardial dysfunction

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Background.
Cardiac operations with cardiopulmonary bypass in children are related to the systemic release of inflammatory mediators. Among them, interleukin(IL)-6, plays a central role as this cytokine possesses pro-inflammatory properties, causing in the early course of the systemic inflammatory reaction myocardial damage and as it controls acute phase response.
This study was designed to test the hypothesis that IL-6 after cardiac operation is a marker of organ dysfunction and correlated with postoperative outcome.

Methods.
In 58 patients (median age: 4 9/12 years), serum levels of IL-6 were measured immediately after end of cardiopulmonary bypass, 4- and 24 hours po and were correlated with po outcome. Cardiac outcome was quantified by using a score system at the end and 4 hours po that takes into account duration of surgery, po hemodynamics and need for inotropic- and pacing support.

Results.
IL-6 levels were maximal at the end of CPB (202.4 +/- 47.3 pg/ml, mean +/- SEM), decreasing in the po period to reach 142 +/- 42 pg/ml and 51.2 +/- 17.3 pg/ml 4- and 24 hours po, respectively.
IL-6 levels at the end of CPB correlated with duration of CPB (p<0.001) and myocardial ischemia time (p<0.05). It also correlated negatively with ultrafiltrated volume at the end of the operation (p<0.005), with po blood pressure and with oxygenation index (p<0.05, respectively).
 Patients with a cardiac score > 90th Percentile had IL-6 concentrations after CPB > median value for the whole group. A cut off value could, however, not be defined.

Conclusions.
IL-6 levels measured at the end of CPB correlated with postoperative morbidity, especially with impairment of cardiovascular function.
Although a clear cut off value could not be defined in this series, IL-6 levels measured immediately after cardiac surgery might allow identifying individuals at risk to develop postoperative organ dysfunction. These individuals would profit from early anti-inflammatory strategies in the postoperative course.