Hyperprocalcitonemia in Patients with Noninfectious SIRS and Pulmonary Dysfunction Associated with Cardiopulmonary Bypass

Hensel M, Volk Th, Doecke W D, Kern F, Tschirna D, Egerer K, Konertz W, Kox W J

Background:
The incidence of noninfectious systemic inflammatory response syndrome (SIRS) associated with coronary artery bypass surgery and the potential role of several inflammatory parameters as early markers of pulmonary dysfunction induced by cardiopulmonary bypass (CPB) were investigated.

Methods:
Forty patients undergoing elective coronary artery bypass surgery were studied prospectively. Perioperative lung function was monitored using the lung injury score introduced by Murray and colleagues, by measuring venous admixture (Qs/Qt), and, in some cases, by measuring extravascular lung water. Serum concentrations of the inflammatory parameters (procalcitonin, interleukin-6, sL-selectin, leukocyte elastase, neopterin, leukocyte counts, and C-reactive protein) were determined sequentially. The American College of Chest Physicians-Society of Critical Care Medicine classification system was used to diagnose SIRS.

Results:
According to the entry criteria, SIRS developed in 17 (42%) patients after operation. Nine patients of this group showed signs of acute pulmonary impairment, whereas patients without SIRS had no lung injury. In all patients with acute lung injury, distinct increases in procalcitonin concentrations ranging from 5.1 to 14.3 ng/ml were measured. In patients with SIRS but without acute lung injury and in patients without SIRS, none or only negligible increases in serum concentration of procalcitonin were seen. Compared with procalcitonin, other inflammatory parameters investigated were less sensitive and less specific to indicate pulmonary dysfunction secondary to CPB.

Conclusions:
Procalcitonin seems to be an appropriate parameter indicating the early development of severe noninfectious SIRS and for predicting pulmonary dysfunction secondary to CPB.

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