Case of the week 10/2017

Use of CytoSorb in combined interventions on aorta arch and coronary arteries

Denis V. Federiakin, PhD, A.V. Goncharuk, A.V. Anokhin
Cardiosurgery Unit and ICU
Tver City District Hospital State Medical Center, Central Russia

This case study reports on a 62-year old male who was admitted to Tver Regional Hospital Cardiosurgery Unit for elective coronary bypass surgery.

Case presentation

- The patient's medical history included an acute myocardial infarction followed by elective coronary angiography revealing the following multivessel disease: anterior interventricular branch stenosis up to 75% in the proximal one-third; circumflex artery stenosis up to 90% in the medium one-third; obtuse marginal branch stenosis up to 65% in the proximal one-third; right coronary artery occlusion in the median one-third
- Elective surgical on-pump myocardial revascularization was performed and 4 distal anastomoses were created sequentially
- At the time of reperfusion, there was evidence of aorta sutures disruption and posterior aortic wall ripping accompanied by severe bleeding. Sealing did not stabilize the aortic bleedings and the decision was made to perform supra-coronary prosthetic replacement of the ascending aorta
- As on-pump times were expected to be long, CytoSorb was inserted into the cardiopulmonary bypass circuit in a preemptive manner
- The patient was postoperatively transferred to ICU where he developed an acute renal failure with glomerular filtration rate under 40 ml/min while subcompensated acidosis set in
- High doses of norepinephrine were required, cardiac index and respiration indexes dropped, initial stages of disseminated intravascular blood coagulation syndrome were noted
- At this stage it was decided to start extracorporeal renal replacement therapy with CytoSorb in the circuit

Treatment

- Four consecutive treatments with CytoSorb for a total treatment time of 120 hours (treatments for 30 hours each)
- CytoSorb was used in conjunction with CRRT (Multifiltrate, Fresenius Medical Care, Ultraflux AV1000S filter) performed in high-flux venovenous hemofiltration mode
- Blood flow rate: 150-200 ml/min (depending on the clinical situation)
- Anticoagulation: heparin
- CytoSorb adsorber in CVVH circuit position: pre-hemofilter

Measurements

- Demand for catecholamines
- Lactate
- Cardiac Index
- Respiration index
- Blood loss from drains

CytoSorb®

Results

Perioperative use:

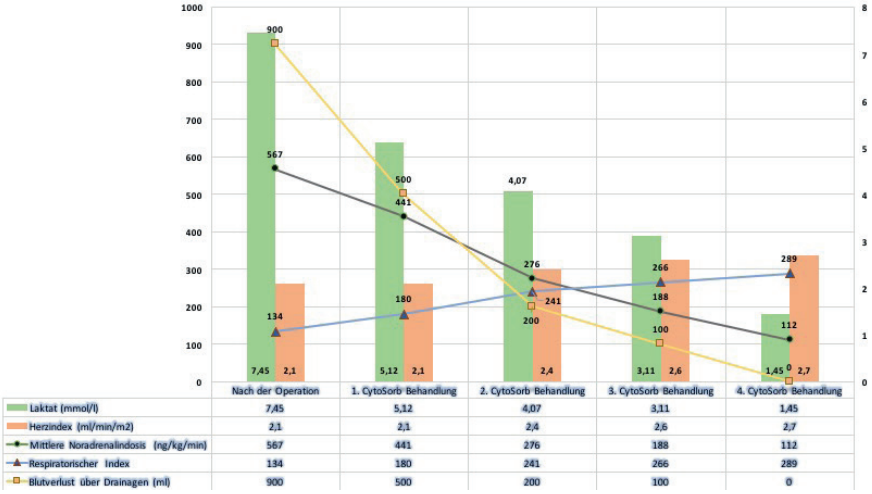
- CytoSorb added patient safety to the predicted long 2nd cardiopulmonary bypass time and helped to prevent intraoperative SIRS onset (data not shown)

Postoperative use on ICU:

- Immediately after the start of CytoSorb the patient's condition improved considerably
- Lactate levels dropped from 7.45 mmol/l after operation to 1.45 mmol/l after the 4th CytoSorb session
- Mean dose of norepinephrine could be reduced from 567 to 112 ng/kg/min while at the same time cardiac index improved from 2.1 to 2.7 l/min/m2
- Respiratory index increased from 134 to 289 during the course of the four treatments
- Drainage bleeding subsided from initially 900 ml directly after the operation to 0 ml after the last CytoSorb treatment

Patient Follow-Up

- Patient was extubated earlier than expected after respiratory index reached 250
- No development was CIP/CIM registered
- After a week on ICU, CVVH could be stopped and the patient was hemodynamically stable
- After 12 days the patient could be discharged from the ICU to the general ward and released from hospital 25 days after cardiac surgery



CONCLUSIONS

- In this case CytoSorb was used in both the perioperative and postoperative cardiosurgical setting
- Treatment with CytoSorb was accompanied by an unexpectedly rapid and significant stabilization in hemodynamics and declining catecholamine dosages within hours of its introduction
- Application of CytoSorb in the circuit of the HLM and in combination with CVVH and was safe and easy