Septic Shock in Severe Acute Pancreatitis, Treated with Cytosorb-Case Series

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ABSTRACT

Severe acute pancreatitis can lead to systemic inflammatory response and multiple organ failure, associated with high mortality. Serum interleukin-6 and interleukin-8 levels appear to be correlated with severity of pancreatic inflammation. CytoSorb, cytokine adsorber, is indicated in situations where cytokines are elevated. In one-year period, four patients with severe acute pancreatitis were admitted to surgical intensive care unit. On admittance, they met criteria for septic shock and APACHE II score ≥ 30. Creatinine clearance was reduced; values of urea, creatinine, lactate, C-reactive protein and procalcitonin were elevated in all patients. We treated the patients according to Surviving Sepsis Guidelines (fluid resuscitation and administration of norepinephrine for mean arterial pressure > 70 mmHg). After CT scan confirmed necrotizing pancreatitis, patients were operated within 24 hours. Postoperatively patients become anuric and inflammatory parameters further increased. Haemodialysis was performed, but only on the median of six days after septic shock confirmation, CytoSorb was installed to the device. Patients received 2–3 consecutive treatments, lasting for 10–12 hours. Despite CytoSorb use and initial decline in interleukin-6 values, the condition of all four patients worsened.

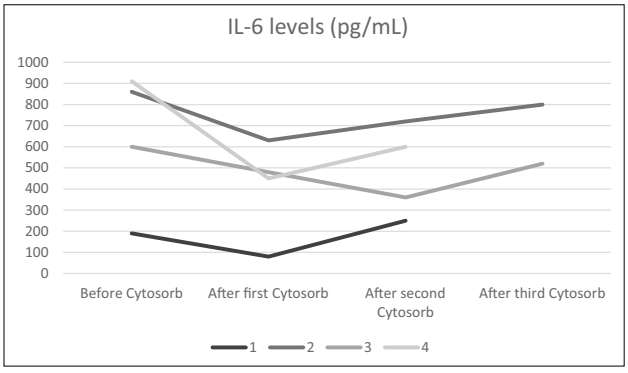

Figure 1. Plasma levels of interleukin-6 after CytoSorb treatment in patients 1 to 4. IL-6 – interleukin-6.

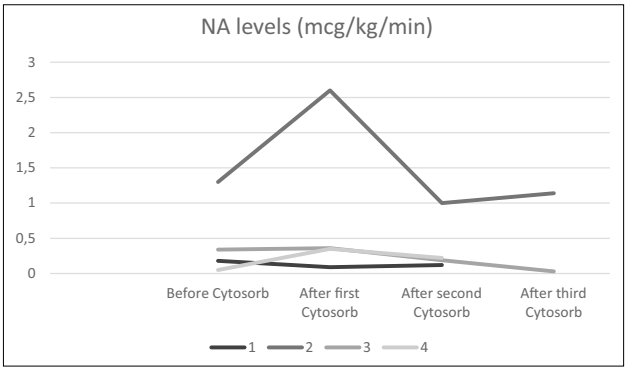

Figure 2. Noradrenaline demand after CytoSorb treatment in patients 1 to 4. NA – noradrenaline.

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Interleukin-6 values rose again, and all patients died. Researchers claim that earlier (within 24 hours) aggressive intervention during the onset of organ failure leads to more successful outcomes whereas the delay in the start of the therapy has poor response. The reason for ineffective treatment in our patients could be delayed CytoSorb use, patients' age and advanced pancreatic inflammation. We confirmed the opinion of other authors that Cytosorb treatment should be initiated immediately after the confirmation of a septic shock and multiple organ failure, before the irreversible organ and organ systems malfunction appear.

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Table 1. Patent characteristics, laboratory values and calculated parameters at admission to intensive care unit. APACHE II – Acute Physiology and Chronic Health Evaluation, CrCl – creatinine clearance, CRP – C-reactive protein, PCT – procalcitonin, PaO_2 – arterial oxygen partial pressure, FiO_2 – fractional inspired oxygen, SOFA – sequential organ failure assessment.

Patient	Age	APACHE II		CrCl (mL/min)	Lactat	CRP	PCT	PaO_2/FiO_2	SOFA
1	71	30		20	1.85	72	1.64	10.2/30	19
2	75	41		15	1.35	103	0.77	13.8/40	12
3	74	38		34	11.6	194	25.83	12.5/60	18
4	72	36		31	22	322	9.28	14/40	14

Table 2. Values before CytoSorb treatment. APACHE II – Acute Physiology and Chronic Health Evaluation, NA – noradrenaline, CrCl – creatinine clearence, CRP – C-reactive protein, PCT – procalcitonin, PaO_2 – arterial oxygen partial pressure, FiO_2 – fractional inspired oxygen, SOFA – sequential organ failure assessment, IL-6 – interleukin-6.

Patient	APACHE II	NA (mcg/kg/min)	CrCl (mL/min)	Urea	Creatinine	Lactate	CRP	PCT	PaO_2/FiO_2	SOFA	IL6
1	30	0.18	22	11	139	3.2	116	2.91	11.7/30	18	190
2	48	1.3	13	47	364	13	104	7.24	12.5/70	20	860
3	36	0.34	21	13.5	255	2.3	264	36.76	9.5/60	20	600
4	30	0.05	20	28.5	170	5	58	2.83	9.9/50	20	910