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Observations in early vs. late use of CytoSorb® haemadsorption therapy in critically ill patients

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Background

In several studies and in in-vitro data is demonstrated that the additional treatment with an extracorporal cytokine adsorption filter (CytoSorb®, Cytosorbents) may be helpful in patients with multiorgan failure due to increased cytokine levels. CytoSorb® is used as adjunctive therapy not only in septic multiorgan failure but also in severe pancreatitis and other critically ill. The effect is based on biocompatible, highly porous polymer beads able to capture and adsorb cytokines and other middle molecules. CytoSorb® therapy has meanwhile been used in over 200 hospitals worldwide in more than 5500 patients and is well tolerated and safe.

Methods

Patients with severe SIRS and at least two organ failure due to acute infection were enrolled and assigned to receive an intervention with CytoSorb® haemadsorption therapy. One of the organ failures had to be acute kidney injury. Exclusion criteria were: pregnancy or breast-feeding, age < 18 years, conditions of end-stage diseases. Aim of our case study was to show the effectiveness of CytoSorb® treatment used as adjunctive therapy in critically ill patients. If after initial therapy following actual guidelines there was no decrease in catecholamine demand and kidney injury was persistent, CytoSorb® therapy was initiated. We collected data before, during and after treatment and calculated the demand of norepinephrine (µg/h vs. thereby achieved mmHg MAP).

Results

We collected data from 14 patients. The focus was abdominal (28.6 %), pneumonia (50 %) and pancreatitis (14.3 %). 42.8 % were female, mean age was 56.4 years, mean APACHE II Score was 37, overall survival was 35.7 %. In contrast we observed a survival of 66.7 % when start of therapy was delayed less then 24 h. Poor outcome increased in patients with late start of CytoSorb® (survivors in delay < 48 h : 50%, in delay > 48 h: none). Start of CytoSorb® therapy in nonsurvivors was by far later than in survivors (61.3 h vs. 28.8 h). After CytoSorb® therapy we observed pronounced decrease of catecho-lamine demand (Norepinephrine µg/h vs. thereby achieved MAP): Catecholamine demand decreased 10-fold (µg/h/mmHg: 84.81 vs. 8.84). Blood lactate level was divided into halves (mg/dl: 42.7 vs. 20.2).

Conclusions

- One effect we could determine in our patients was a pronounced decrease in catecholamine demand and blood lactate level.
- Increased survival occured if treatment with the haemadsorption filter started early. Patients who had a greater delay in start of therapy had poor outcome.
- Reasons for delay had been late acute renal failure or late admission to ICU.
- Our observations implicate that a preferably early start of therapy not later than 24 hours after diagnosis of septic shock / severe SIRS is crucial for survival.