

THERAPEUTIC APHERESIS IN THE TREATMENT OF ACUTE LUNG INJURIES

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Acute lung injuries — respiratory distress syndrome (RDS) — rather frequent and severe complications of acute pneumonia and other diseases (acute inflammatory diseases of abdominal organs, severe traumas, burns, eclampsia, septic shock and other). RDS is the major causes of unfavorable outcomes, despite the use of most modern medicaments.

Our previous experimental studies have demonstrated that endotoxemia developed in animals since first minutes of acute pneumonia modeling. There are many pathogenous factors of endotoxemia: bacterial endo- and exogenous toxins, inflammatory toxic metabolites, products of proteolysis, activation of lipid peroxidation and decrease of anti-oxidation protection, toxic middle molecular weight compounds (oligopeptides), lysosomal enzymes.

As a result arise some complications of endotoxemia: increase vascular permeability (microvascular leaking), hypoproteinemia, hypocoagulation hypovolemia, low blood pressure, toxic pulmonary edema — respiratory distress syndrome, acute respiratory insufficiency, disseminated vascular coagulations syndrome and, as result — multiple organ failure.

PATIENTS AND METHODS. We analyzed the therapy of 153 RDS patients: 99 with moderate, 44 with severe and 10 with extremely severe degree of lung injury. 67 patients received the conventional therapy only (antibiotics and other drugs, and in severe degree of RDS — mechanical lung ventilation). 76 patients received an additional detoxication therapy — hemoadsorption or plasma exchange (membrane plasmapheresis with “Hemofenix” device end exchange 1.5–2.5 l of plasma). 10 patients with extremely severe RDS were underwent the extracorporeal membrane oxygenation of the blood (ECMO) with hemoadsorption.

RESULTS. In moderate RDS group there were no lethal outcomes. But the duration of hospital stay was significantly lower in patients underwent detoxication than in ones of control group ($28,9 \pm 1,5$ versus $40,3 \pm 3,3$ days; $p < 0,05$), and there were no destructive processes in lungs.



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In patients with severe RDS and only conventional therapy the lethality level attained 74% while additional using of hemoadsorption or plasmapheresis allowed to decrease it to 31%. We failed to save just patients in which detoxication was performed in more late terms after the disease onset. The extremely severe RDS degree was characterized by practically total injury of lung parenchyma and severe respiratory failure, which was not corrected with mechanical ventilation. Using ECMO during from 15 to 44 hours with 3–4 hemoadsorption procedures allowed to save 7 of 10 these patients.

CONCLUSION. The results of the study performed demand a radical revision of fixed therapeutic schemes for acute pneumonias and RDS, still based predominantly on antibacterial therapy. However, the most powerful antibiotic don't eliminate the endotoxins but can even aggravate it due to massive bacteria death and lysis. However, in most of these cases the fact of progressing course of the acute respiratory syndrome indicates an initial lack of defense systems. Medicament immune stimulation is also unable to restore suppressed mechanisms of immune defense. Under these conditions is pathogenetically well-founded conducting of a special detoxication therapy based on plasma exchange with compensation of removed volume (up to 1–1.5 of circulating plasma volume) with donor plasma.