

ABSTRACT

In patients after cardiac surgery, there is an increase in the level of molecules with both pro-inflammatory and anti-inflammatory effects. This increase is influenced by the patient's clinical condition, but also by the nature of the operation itself, which uses conventional extracorporeal circulation. This technique leads to damage to blood elements by direct contact with air and parts of the extracorporeal circulation, as well as to ischemia-reperfusion injury. The specifics of cardiac surgery then affect possible postoperative complications such as multiorgan failure or septic shock.

The diploma thesis is divided into a theoretical and a practical part. The theoretical part describes the principle and influence of cardiopulmonary bypass on the human body and the complications that are associated with its use. Furthermore, IFN- γ is described herein as a potential marker of septic conditions that could reflect the clinical postoperative condition of patients.

The practical part of the diploma thesis monitored the percentage change of selected cell populations and the production of IFN- γ in the peripheral blood of patients before and after cardiac surgery. Furthermore, the response of individual isolated populations of healthy volunteers to selected stimulators was investigated.

The percentage of monitored cell populations and IFN- γ production in cardiac surgery patients were significantly reduced in the postoperative period compared to the condition before surgery. This decrease indicates a disruption of the integrity of the immune system where the patient is unable to respond fully to microbial stimuli. In healthy volunteers, the highest production of IFN- γ occurred in isolated T-lymphocytes, which were able to produce IFN- γ only after the combined stimulation associated with the activation of the TCR complex.

Key words: leukocyte stimulation, IFN- γ , sepsis, cell isolation, cardiac surgery, cardiopulmonary bypass, immunosuppression