Category :**Sepsis/septic shock: management**

A156 - ***Extracorporeal immune cell therapy of sepsis - ex vivo one-way results***

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Introduction:

Immune cell dysfunction is a crucial part in sepsis. Granulocyte concentrate (GC) transfusions, as the only available immune cell concentrates, potentially induce tissue damage via local effects of neutrophils. Therefore, using the donor immune cells purely extracorporeally is an attractive option. Clinical trials with standard GC in an extracorporeal plasma treatment achieved beneficial effects. In this ex vivo study, purified GC with longer storability were investigated in a simplified extracorporeal plasma treatment system.

Methods:

Purified GC (pGC) were stored up to 3 days and used in a plasma perfusion therapy model simulating a 6 h treatment. The extracorporeal circuit consists of a blood circuit and a plasma circuit with 3 plasma filters (PF). PF1 is separating the plasma from the patient's blood, plasma is perfused through PF2 containing the donor immune cells and only the treated plasma is re-transfused. A PF3 is included in the plasma backflow as a redundant safety measure. 1000 ml donor plasma was used to simulate patients. Granulocyte efficacy information on phagocytosis, oxidative burst and cell viability as well as cytokine release and metabolic parameters were assessed.

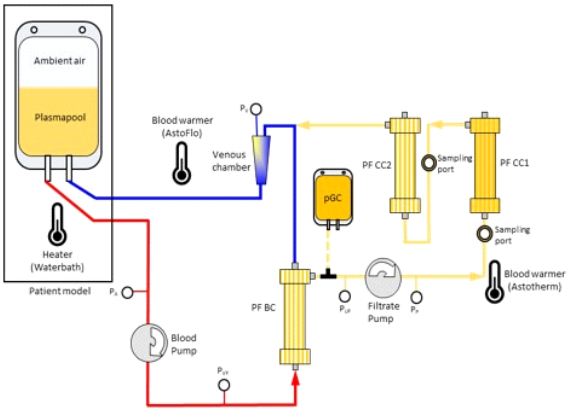
Results:

Cells were viable throughout the study period and exhibited well-preserved functionality and efficient metabolic activity. No indication of immune cell impairment was detected. Also, cytokines are actively secreted during the extracorporeal treatment simulation. Of particular interest is equivalence in performance of the granulocytes on day 1 and day 3, demonstrating sustained shelf life of pGC.

Conclusion:

Results demonstrate that cells are highly active in removing toxic or inflammatory compounds from plasma and secreting cytokines into plasma. Furthermore, granulocytes remain viable and active even after storage for 3 days supporting the use of the system in clinical trials.

Image :



Schematic of the treatment simulation experiments of the extracorporeal immune cell therapy. Plasma is continuously filtered from the patient´s extracorporeal blood circuit and transferred into a closed-loop 'cell circuit' (CC), where the plasma is brought into direct

contact with therapeutically effective, human-donor immune cells (i.e. the purified granulocyte concentrate pGC).