Category :**Respiratory: VV-ECMO**

A323 - ***Motility of neutrophil granulocytes in patients with ecmo***

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Introduction:

Neutrophil granulocytes (NG) are the „first line of defence“ against numerous infections (e.g., fungi and bacteria). Patients with severe acute respiratory distress syndrome (ARDS) due to respiratory infections are often treated with extracorporeal membrane oxygenation (ECMO). The impact of the ECMO circulation on the motility of immune cells has just been explored in a few studies and needs further investigation.

Methods:

This was a prospective, single-centre study. Only patients who were successfully weaned from ECMO were included in the study. Blood samples were taken daily up to 30 days. A new prototype of microscope (ComplexEye) was used to image motility (percentage of moving cells and average speed of moving cells) of NG in a 96-well plate. Different NG-stimuli were used during the study (CXCL1, CXCL8 and fMLP). Subsequent analysis was done by artificial intelligence software.

Results:

28 patients were included. 9 patients could successfully weaned from ECMO and included in the final analysis.
Results during ECMO therapy: The average percentage of moving cells was 70,73 % in unstimulated NG (PBS), 87,15 % (fMLP), 77,86 % (CXCL1) and 84,05 % (CXCL8) in stimulated NG (Fig. 1). The average speed of moving cells in unstimulated NG was 5,61 µm/min and 12,15 µm/min (fMLP), 6,6 µm/min (CXCL1), 9,08 µm/min (CXCL8) in stimulated NG (Fig. 2).
Results after ECMO therapy: The average percentage of moving cells was 66,11 % in unstimulated NG (PBS), 87,22 % (fMLP), 69,29 % (CXCL1), 84,94 % (CXCL8) in stimulated NG (Fig. 1). The average speed of moving cells in unstimulated NG was 5,3 µm/min and 11,7 µm/min (fMLP), 5,98 µm/min (CXCL1), 8,91 µm/min (CXCL8) in stimulated NG (Fig. 2).

Conclusion:

There was no significant difference in the percentage of moving cells or average speed of neutrophil granulocytes during ECMO therapy compared to no-ECMO therapy in 9 critically ill patients. This data shows that ECMO therapy does not alter chemotaxis in neutrophil granulocytes in critically ill patients with ARDS.

Image :

Figure 1

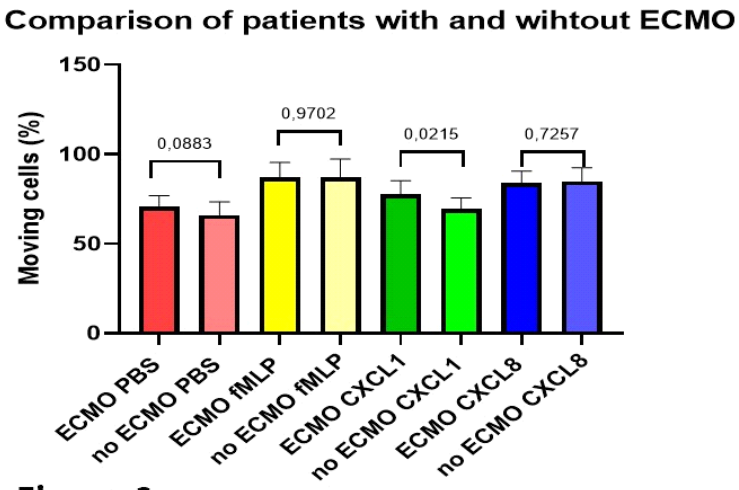

Figure 2

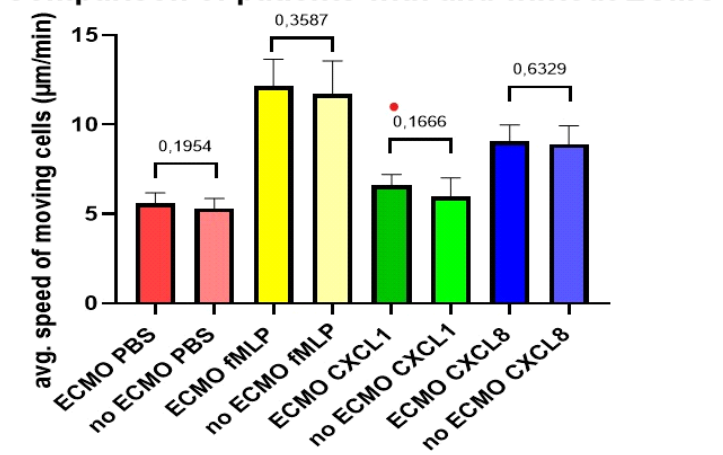

Figure 1 shows percentage of moving cells with different stimuli during and after ECMO therapy of 9 patients. Figure 2 shows average speed of moving cells with different stimuli during and after ECMO therapy of 9 patients. Results are presented as mean and standard deviation. P-values for paired t-tests