Introduction:
The aim of the present study was to analyze the determinants and prognostic implications of the recently proposed acute cor pulmonale (ACP) clinical risk score(1) in patients with severe acute respiratory distress syndrome (ARDS) rescued with venovenous (VV) extracorporeal membrane oxygenation (ECMO).

Methods:
Single-center retrospective study of patients (n=152; 45±11.8 years; 63% males) undergoing VV-ECMO for severe ARDS. The ACP-Score (0-4) was calculated immediately before ECMO initiation and at ECMO-Day1, -Day3 and -Day7, as follows: pneumonia as cause of ARDS - 1 point; driving pressure ≥18cmH2O - 1 point; PaO2/FiO2 ratio <150mmHg - 1 point; PaCO2 ≥48mmHg - 1 point.

Results:
Longer duration of mechanical ventilation before VV-ECMO was associated with higher ACP-Scores. Patients with higher ACP-Scores before VV-ECMO also presented longer total duration of mechanical ventilation and hospital stay. After VV-ECMO initiation, ACP-Scores significantly decreased from 3.0±0.74 to 1.5±0.84, 1.5±0.96 and 1.6±0.99 at ECMO-Day1, -Day3 and -Day7, respectively. At ECMO-Day7, patients with higher ACP-Scores (3-4) presented increased hospital mortality when compared with patients with lower ACP-Scores (0-2): 47.6 vs. 24.7%, respectively (p=0.038). At ECMO-Day7, high driving pressures and low PaO2/FiO2 ratios were the ACP-Score determinants that significantly associated with increased hospital mortality.

Conclusion:
In severe ARDS, VV-ECMO support allowed a significant and sustained ACP-Score reduction in most patients. This was achieved by artificial lung correction of low PaO2/FiO2, hypercapnia and elevated driving pressures. After an initial period of VV-ECMO support, patients with higher ACP-Scores present higher mortality rates. Our results suggest that on-going adjustment of ECMO and ventilation parameters is necessary to maximize outcome.

References: