Introduction:
Veno-venous extracorporeal membrane oxygenation (ECMO) support can be combined with a variety of different non-invasive ways to deliver oxygen to the patient’s lung. Several positive effects might be linked to this so called “awake ECMO”. So far there is little evidence about indications and outcome of this approach.

Methods:
We report retrospective registry data on all ARDS patients treated with ECMO support at a university hospital between 10/2010 and 04/2019. In a systematic review of medical records, we distinguished between patients with invasive mechanical ventilation (IMV) from the initiation of ECMO therapy (IMV group) and patients that received any kind of non-invasive oxygen supply (non-IMV group).

Results:
A total of 276 patients could be analysed. 16 (5.8%) patients received non-IMV ECMO support. Patients receiving non-IMV ECMO therapy showed severe underlying pulmonary disease and immunosuppression (figure 1). These patients had higher rates of lung fibrosis, long-term oxygen therapy, pulmonary hypertension, renal insufficiency and immunosuppression (p<0.05).

12 of 16 patients (75%) required IMV during the hospital stay in average 5.3±5.0 [0.8-17.1] days after ECMO initiation. Reasons were hypoxia despite of ECMO, insufficient ECMO-flow, insufficient protective reflexes or patient agitation. Patients with initially non-IMV ECMO support showed a numerical but not significant lower ICU and hospital survival (25.0% vs. 45.4%, p=0.111).

Conclusion:
Non-IMV ECMO support was applied in patients with severe underlying pulmonary disease and/or immunosuppression. In a high proportion of patients the ventilation regime had to be switched from non-invasive to invasive. Survival in this very selected cohort was low. In this retrospective analysis no evident benefit for a non-invasive ventilation strategy could be found. The high proportion of patients who switched from non-IMV to IMV therapy underlines the need for rigorous patient selection.
Figure 1. Underlying pulmonary disease or status of immunosuppression in ECMO patients without invasive mechanical ventilation.