BilevelPAP treatment in Acute Hypercapnic Respiratory Failure
Biomarkers and clinical factors that can predict treatment outcome and mortality

Abstract for halv-time control 9th of May 2018

Background: Patients with Acute Hypercapnic Respiratory Failure (AHRF) are often treated with Noninvasive Positive Pressure Ventilation (NPPV). In this heterogeneous patient group, there is a lack of clinical tools for predicting mortality and outcome.

Objective: To explore the potential use of several inflammatory biomarkers and clinical factors in predicting short-time and long-time mortality in patients with AHRF treated with NPPV.

Methods: The study population were 46 patients treated with NPPV for AHRF. Clinical and background data was registered and blood samples taken for analysis of inflammatory biomarkers. Based on earlier studies, IL-8, GDF-15 and ST2 were selected and related to risk of mortality (primary endpoint) using Cox proportional hazard models.

Preliminary results: Of the 46 patients, there were 3 subgroup in regards to primary diagnosis: Acute Exacerbation of COPD (AECOPD, n=34), Acute Heart Failure (AHF, n=8) and Acute Exacerbation in Obesitas Hypoventilation Syndrome (AEOHS, n=4). IL-8 values were compared to short-time mortality and we found that Hazard Ratio for 28-days mortality per 1-SD increment of IL-8 was 3.88 (95% CI 1.86-8.06, p<0.001). GDF-15 was correlated to short-time mortality in the same way, but when put into the same model as IL-8, the significance disappeared. ST2 values were an independent predictor of both short-term and long-term mortality during the follow-up period of 30 months. The Hazard Ratio (HR) for 28-days mortality per 1-SD increment of ST2 was 11.00 (95% CI 1.8 - 67.2, p 0.009), and for 18 months mortality per 1-SD increment of ST2 the HR was 2.11 (95% CI 1.4 - 3.2, p 0.001). The results of both IL-8 and ST2 analyses seem to be driven by the largest subgroup of patients, with AECOPD.
Conclusions: In patients with AHRF of various causes treated with NPPV, IL-8 and ST2 are targets to explore further as a predictor for mortality.

List of papers:

2. Jonsdottir, B. et al., ST2 predicts mortality in patients with Acute Hypercapnic Respiratory Failure treated with Noninvasive Positive Pressure Ventilation. In manus