Title: Glycaemia as an outcome predictor in respiratory failure due to COPD exacerbation in an intensive care unit

Body: Rationale: Hyperglycaemia has been associated with poor outcomes during non-invasive ventilation in severe Chronic Obstructive Pulmonary Disease Acute Exacerbation (COPD-AE). Aim: Ascertain hyperglycaemia as an outcome predictor of COPD-AE requiring IMV in an ICU. Methods: Patients admitted to Pulido Valente's Hospital Respiratory ICU over a period of 7 years for COPD-AE demanding IMV were retrospectively accessed and analyzed. Random blood glucose levels were determined within the last 24h prior to IMV. Hyperglycaemia was defined as ≥126mg/dL. Poor outcome was defined as death, permanent tracheostomy or need to reintubate. Results: A total of 89 patients (median±IQR, 70.0±15 years, 83.3% men) with COPD-AE (median baseline FEV1 34.5±26.5% of predicted) were invasively ventilated due to respiratory failure (median pH 7.25±0.13, median PaO2/FiO2 103.0±143.0). Median BMI was 24.0±6.0 kg/m2, 15.7% of the patients were under systemic corticosteroids and 20.2% were diabetic. Median blood glucose level was 128.0±50.0 mg/dL. Hyperglycaemia was not significantly correlated to the APACHE score, respiratory failure severity, systemic corticotherapy or BMI. Also, hyperglycaemia and poor outcome did not show a significant correlation (p<0.05) but when considering only the variable death, a positive trend could be found in particular for glucose >200mg/dL (p=0.1). Conclusions: Hyperglycaemia did not predict a poor outcome in respiratory failure due to COPD-AE. However, data from a small sample retrospectively collected and blood glucose levels randomly determined may have misled the results. Further studies are needed to elucidate the positive trend between hyperglycaemia and mortality.