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Title: Use of non invasive ventilation (NIV) in a general medical ward (GMW) for the treatment of acute hypercapnic respiratory failure (AHRF) in COPD

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Body: Background: Although the efficacy of NIV treatment in COPD patients with AHRF is well established when applied in Intensive Care Units (ICU), its feasibility in a GMW remains controversial. Aims: In this study we aimed to assess the occurrence of adverse events (transfer to ICU and in-ward mortality) and to identify related clinical and laboratory markers of potential interest. Furthermore, we evaluated patients' survival rate after discharge. Methods: 56 COPD patients (age: 70.4±11.5 years) treated with NIV for AHRF were studied; Pneumonia (Pn) was diagnosed in 31 cases (55.3%). Arterial blood gases, respiratory rate (RR) and Kelly's scale (Ks) were monitored at baseline and during NIV treatment (at 1 and 48 hour). Adverse events during hospitalization were recorded. After discharge, patients' survival rate at 1-year was recorded. Results: A significant (p<0.0001) improvement in pO₂, pCO₂, pH, RR and Ks was observed at 1 and 48 hours of NIV treatment. Adverse events occurred in 19.6% of patients (in-ward mortality 14.2% and ICU transfer 5.3%). Mean patient survival rate at 1-year after discharge was 74.2%. Adverse events, and particularly in-ward mortality, occurred at higher rate in the presence of Pn (32.3% vs 4.0%, p=0.01) and baseline serum [HCO₃⁻] ≤35.0 mEq/L (34.5% vs 3.8%, p=0.006). Conclusions: Our results support the efficacy and feasibility of NIV treatment in a GMW for COPD patients with AHRF with data similar to those reported in literature in ICU. The presence of pneumonia and low HCO₃⁻ levels seems to be negatively related to the occurrence of adverse events. Larger prospective studies are necessary to confirm these findings.