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Title: Factors predicting outcome of non-invasive ventilation (NIV) for acidotic hypercapnic respiratory failure (AHRF) from lung diseases other than COPD

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Body: Background: NIV is the treatment of choice for AHRF in acute exacerbation of COPD, neuromuscular and thoracic cage disorders, but its indications have widened in UK hospitals, particularly in patients with AHRF of any cause whose comorbidities preclude invasive ventilation - we sought to establish the predictors of outcome in non-COPD Lung and Airway patients with AHRF. Methods: Cohort analysis of prospectively collected data on acute NIV for non-COPD Lung and Airway diseases with AHRF in a ward-based NIV unit over 5 years recording diagnoses, demographics, response to NIV at 4 hours and in-hospital deaths (univariate analyses as total numbers too low for logistic regression). Results: NIV was used to treat 39 episodes of pneumonia, 25 of exacerbations of non-cystic fibrosis (CF) bronchiectasis, 15 of asthma and 3 of CF (in 38, 22, 11 and 3 individuals respectively); comprising 5.67% of all acute NIV episodes. All subgroups among non-COPD Lung and Airway patients receiving NIV for AHRF had impaired lung function with mean FEV1 of 34%, 41%, 43% and 18% respectively; 2 from the pneumonia group were intubated and 12 died during the admission - significantly more than the other subgroups ($p=0.049$); initial pH significantly predicted death in non-CF bronchiectasis ($p=0.007$). Conclusions: In conditions other than COPD exacerbations, neuromuscular and thoracic cage disorders, acute NIV is used little in our unit (5.67%); when used, the predictors of death are broadly similar to COPD in non-CF bronchiectasis, but less predictable in the other groups, pneumonias being associated with higher co-morbidity and in-hospital mortality.