

European Respiratory Society Annual Congress 2012

Abstract Number: 1943

Publication Number: P2061

Abstract Group: 2.2. Noninvasive Ventilatory Support

Keyword 1: Ventilation/NIV **Keyword 2:** Acute respiratory failure **Keyword 3:** Critically ill patients

Title: Noninvasive ventilation in the emergency department: Early predictors of outcome in acute cardiogenic pulmonary oedema

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Body: INTRODUCTION The application of early continuous noninvasive ventilation (NIV) is well established in the Emergency Department (ED) for the treatment of acute respiratory failure (ARF) due to Acute Cardiogenic Pulmonary Oedema (ACPO). AIMS AND METHODS To critically analyse the impact of NIV in ACPO, about ARF presentation and the treatment efficacy or failure (defined as hospital mortality or need for invasive mechanical ventilation). Observational clinical study in the real life practice of the ED of a University teaching Hospital, during 5 months, including every patient emergently admitted and treated for ACPO according to inclusion criteria referring to an institutional protocol. RESULTS 214 patients (media 1.42/day). Failure rate 15,5%. Failure versus success groups were similar in many characteristics and parameters. They were mainly different in: comorbid diseases, neurologic status, arterial blood pressure, rates of palliative or “ceiling” NIV, leukocytes, AST, CPKMB, troponinT, LDH, PCR, changes in blood gas analysis parameters after 120 minutes. CONCLUSIONS We identified early predictors of outcome in the ED: clinical parameters, biomarkers and arterial blood gas analysis data to recognize severe conditions and the response to treatment. Unnecessary delaying tracheal intubation remains the major hazard of NIV in ARF; the overutilization of NIV is also a concern. A pivotal unresolved question is about selection criteria and early choices for patients having preset therapeutic and prognostic limits and acutely reversible processes. RCTs in the ED are necessary to define the subgroups of patients who are most likely to benefit for the early application of NIV.