Introduction:
The effectiveness of NIV in COPD patients with acute respiratory failure (ARF) due to influenza infection remains controversial. The aim of this study was to characterize COPD patients at risk to NIV failure (NIVf) and their impact on ICU mortality.

Methods:
Secondary analysis from a prospective, observational, multi-center study of COPD subjects admitted to the ICU with ARF due to influenza infection. Demographics data, clinical and laboratory variables and severity of illness were recorded. Three groups were studied: (1) COPD subjects who received NIV at ICU admission and failed (NIVf group); (2) COPD subjects who received NIV at ICU admission and succeeded (NIVs group); and (3) COPD subjects who received invasive mechanical ventilation at ICU admission (IMV group). Univariate and multivariate analysis was performed to determine factors independently associated with NIVf and ICU mortality.

Results:
Of 476 patients, 211 (44.3%) required IMV and 265 (55.6%) NVI. Failure occurred in 118 (44.5%) patients and were more likely to have high severity (SOFA 7 vs. 4, p<0.001), shock (72.9% vs. 13.6%, p<0.05), acute renal failure (31.4% vs. 13.6%, p<0.05), bacterial co-infection (25.4% vs. 10.9%, p<0.05) and hematological disease (5.9% vs. 1.4%, p<0.05) compared to NIVs group. Shock (OR=13.4 [6.36-28.8]) was independently associated with NIVf. The overall ICU mortality was 31% in the IMV group, 39% in the NIVf group and 5% in the NIVs group, respectively (p<0.001 comparing NIV groups). In the multivariate analysis, only number of quadrants infiltrates (OR=1.42 [1.03-1.94], p<0.02), hematological disease (OR=6.27 [1.09-35.9], p=0.04), chronic renal failure (OR=7.3 [2.1-24.4], p=0.02) and NIVf (OR=9.27 [2.9-28.7], p<0.001) were variables independently associated with ICU mortality.

Conclusion:
NIVf is frequent a complication in COPD patients admitted to the ICU with influenza infection. Shock presence should alert clinicians to consider IMV due to the high risk of NIV failure and ICU mortality.