



Real life NIV use in ACPE: preliminary results of a multicentric study on the treatment of ACPE in the Emergency Department

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BACKGROUND

Although Non Invasive Ventilation (NIV) in Acute Cardiogenic Pulmonary Edema (ACPE) is considered a safe and effective treatment in addition to medical therapy, no multicenter real life studies have analyzed the impact of NIV in ACPE.

The objective of this study was to assess epidemiology, treatment, outcomes and prognostic factors in consecutive patients admitted to the Emergency Department (ED) with ACPE.

MATERIALS AND METHODS

A real life multicentric prospective web-based observational study was performed in 12 Italian EDs (www.acpe.it), from May 2009 to July 2010, see Figure 1. ACPE was defined as all the following: respiratory distress, bilateral rales and congestion on chest X-ray. Demographic, clinical and laboratory findings were collected on admission and during hospitalization.

Indications for the use of NIV were at least one of the following:

- Respiratory Rate ≥ 30 bpm
- PaO₂/FIO₂ < 200
- pH < 7.35 and PaCO₂ > 45 mmHg



Figure 1. Headline of the website acpe.it and map of the EDs participating in the study

MATERIALS AND METHODS

Contraindications for the use of NIV were at least one of the following:

- Coma
- Hemodynamic instability / shock
- Lack of compliance

Indications for endotracheal intubation (ETI) were at least one of the following:

- Respiratory or cardiac arrest
- Coma
- Hemodynamic instability

Statistical analysis

All data were statistically analyzed with SPSS version 18 for Macintosh. Descriptive statistics were reported at baseline with continuous data expressed as a mean \pm SD and categorical data expressed as counts. Continuous and categorical data were compared between groups using the t-test and χ^2 test, respectively. A p-value < 0.05 was considered statistically significant.

RESULTS

Since May 2009 to July 2010, 388 ACPE patients were enrolled. A total of 208 patients were males, mean age was 80 ± 10 years, mean pH was 7.29 ± 0.13 . Demographic data, comorbidities and baseline characteristics on admission according to the use of NIV (CPAP or Bilevel) or Oxygen-therapy are shown in Table 1 and in Table 2.

Parameter	Oxygen	NIV	P value
Age (mean \pm DS), years	80 \pm 10	80 \pm 10	0.91
Male, n. (%)	67/124 (54%)	140/263 (53%)	0.88
COPD, n (%)	55/124 (44%)	85/263 (32%)	0.02
Chronic heart failure, n (%)	31/124 (25%)	45/263 (17%)	0.68
Chronic renal failure, n. (%)	36/124 (29%)	67/263 (25%)	0.46

Table 1. Demographic data and comorbidities

RESULTS

Parameter	Oxygen	NIV	P value
Systolic BP, mmHg	156 \pm 36	167 \pm 37	< 0.01
Diastolic BP, mmHg	89 \pm 20	93 \pm 21	0.06
Respiratory rate, bpm	29 \pm 7	34 \pm 7	< 0.01
Cardiac rate, bpm	101 \pm 24	109 \pm 22	< 0.01
pH	7.34 \pm 0.12	7.26 \pm 0.12	< 0.01
PaCO ₂ , mmHg	46 \pm 15	53 \pm 16	< 0.01
PaO ₂ /FIO ₂ ratio	202 \pm 74	199 \pm 92	0.73
Lactate, mmol/L	2.7 \pm 2.8	3.3 \pm 2.4	0.14

Table 2. Baseline characteristics of the two populations

A total of 263 (68%) patients were treated with non-invasive CPAP or Bilevel; 124 patients were treated with oxygen-therapy (32%), one patient was intubated before arrival in the ED (see Figure 2). Among the 124 patients treated with oxygen, 32 were switched to NIV after 30' trial. Moreover, among 214 patients treated with CPAP, 12 were switched to Bilevel (6%).

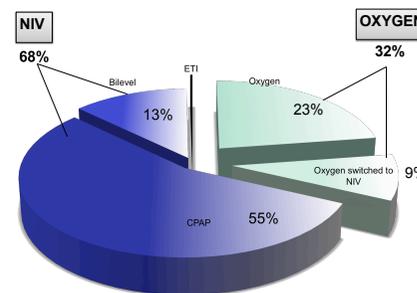


Figure 2. Patients' distribution according to the treatment

RESULTS

In-hospital mortality was 7% (27/388).

Out of 388 patients, 49 were treated with pre-hospital Non Invasive Ventilation (see Table 3).

Outcomes of study populations and adverse events during the treatment are depicted in Table 3, according to the use of NIV and O₂ on admission.

Parameter	Oxygen	NIV	P value
NIV Pre-H	3/124 (2%)	46/263 (17%)	< 0.01
PNX	0/124 (0%)	0/124 (0%)	-
Vomit	4/124 (3%)	3/263 (1%)	0.15
Shock	3/124 (2%)	2/263 (1%)	0.18
Endotracheal intubation	1/124 (1%)	3/263 (1%)	0.76
Mortality	8/124 (6.5%)	19/263 (7.2%)	0.78

Table 3. Use of pre-hospital NIV, outcomes and adverse events in the two populations

CONCLUSIONS

Although NIV is considered safe and effective in the treatment of ACPE, up to 30% of patients are still treated with oxygen therapy; thus, more efforts are needed to implement current guidelines on the use of NIV in ACPE.

Moreover, based on the fact that an early and efficient management is crucial for patients with ACPE, the increasing amount of patients treated with a pre-hospital NIV is an important and encouraging finding.

REFERENCES

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