

# THE IMPACT OF NON-INVASIVE VENTILATION AS A CEILING TREATMENT FOR ACUTE RESPIRATORY FAILURE IN THE EMERGENCY DEPARTMENT

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## Introduction

In last 25 years non-invasive ventilation (NIV) showed main evidence in efficacy for acute respiratory failure (ARF) due to exacerbation of chronic obstructive pulmonary disease and cardiogenic pulmonary edema, and spread out of the intensive care units (ICUs).

Many other conditions, considered as "unusual" indications for NIV, have lower strength of recommendation but are increasing in use, mainly in acute care settings.

The role of NIV as a comfort measure in emergency cases with ARF at the end of life and no indication to tracheal intubation (TI) and invasive mechanical ventilation (for anamnesis, clinical, prognostic or ethical reasons) is still strongly debated, due to the lack of data supporting its use.

## Results (2)

Laboratory Data, work in progress

Neither statistically significant differences, nor predictors of outcome

Arterial blood gas analysis:

in unconventional cases following up "metabolic side" (vs "respiratory / ventilatory")

in the first hours of NIV seems to be relevant to predict the outcome (ABG in conventional cases: respiratory / ventilatory follow up to predict the outcome)

## Conclusions

Work in Progress

(conclusions, questions without answers)

## NIV in the Emergency Department Policlinico Sant'Orsola – Malpighi, Bologna

85 thousand cases / year, 3 NIV cases / day

CPAP and NIPPV > 20 years

ER: 4 ventilators; 12 CPAP flow generators, Boussignac - like devices, Venturi - like devices,

HMDU: 3 ventilators; 8 CPAP f.g., Boussignac, Venturi

Ward: 2 CPAP f.g., Boussignac, Venturi

## Aims, Materials and Methods

To assess the impact and the outcome of NIV as a ceiling treatment in the emergency department (ED), we performed an observational study in the emergency room of a university teaching hospital including every consecutive non-selected patient treated by NIV in a 4 months time. We prospectively (and then retrospectively) analyzed each single case to identify patients in which NIV was used as a ceiling treatment (with the aim to relieve breathlessness, palliate symptoms, achieve comfort, improve alertness and neurological status, minimize adverse effects of opiates) in end-stage diseases. Failure was defined, as usual, as in-hospital death or TI.

## Results (1)

313 cases MV (media 2.57 / day)

297 NIV (media 2.43 / day)

Age (media, median): 81 years, 81

pH: 7.32, 7.33

PaO<sub>2</sub>/FiO<sub>2</sub>: 214 mmHg, 209

NIMV as a "ceiling treatment" rate: 27.4%;

failure rate: 22.7%

## Unconventional indications

rate: 51.1%

"ceiling" rate: 32.6%

failure rate: 26.7%

"ceiling" in failures rate: 52.8%

failure without ETI rate: 80.0%

higher "complexity"

(intensivist involved rate,

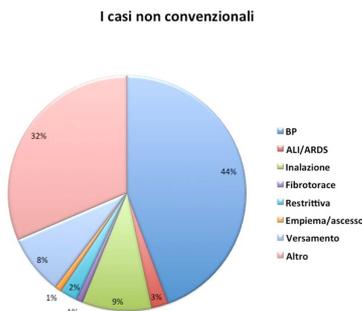
total NIMV time,

changing technique rate,

changing interface rate,

vasopressors rate,

BC transfusion rate)



The use of NIV, for both conventional and unconventional indications, is spreading in the ED: in the latter group (unconventional), failure rate is higher than usual cases (as already known from data coming from ICUs), but in this subgroup the rate of patients with no indication to TI in case of failure (NIV as a ceiling treatment) is dramatically high.

The use of NIV with this purpose must be restricted to centres with trained and experienced personnel, appropriate monitored healthcare settings and adequate NIV equipment; results are not generalisable to every ED or ICU.

A careful discussion about goals of care and life support with preset limit should be done, examining the different perspectives of patients, families and emergency physicians and nurses.

Moreover, due to the spreading use of NIV "off label" in ED cases with a "symptomatic" goal (mainly to decrease dyspnoea without causing unacceptable discomfort) as a "palliative" measure, we then should consider a novel different definition of NIV effectiveness (determination of success, endpoint for NIV, response to failure, with explicit parameters for success and failure) in these patients, whose original goals and outcome are other than survival.