



## LETTERS TO THE EDITOR

### Comments on ‘‘Characteristics of prolonged non-invasive ventilation in hospital emergency departments and their impact on efficacy. Analysis of the VNICat registry’’



### Puntualizaciones sobre «Características de la ventilación no invasiva prolongada en los servicios de urgencias hospitalarios y su impacto en la eficacia. Análisis del registro VNICat»

Dear Editor:

We read with much interest the article entitled *Characteristics of prolonged non-invasive ventilation in hospital emergency departments and impact upon effectiveness. Analysis of the VNICat registry* by Arranz et al.<sup>1</sup>. The first thing we wish to do is congratulate the authors for their interesting work. Also, there are some ideas we'd like to contribute to it as well.

Authors say that specific ventilators were used for non-invasive ventilation. Also, that the variables associated with the mode of ventilation were support pressure (SP), positive end-expiratory pressure (PEEP), continuous positive airway pressure (CPAP), and the value of pressure titration. We think it would have been desirable that all the different modes of ventilation used would have been collected (different hospital resources are listed in the limitations section). However, the variables collected suggest that the mode of ventilation used was SP on PEEP. However, in the result table the term EPAP appears close to the term CPAC. This could make us think that the mode of ventilation used was two pressure levels (BiPAP) and here programming is different. We know that the ventilation support the patient receives is the value of SP, but programming is different, which could lead to unsought misunderstandings when planning ventilation support.<sup>2</sup>

When results are shown on table 1, both the mean and the standard deviation of 2 different values (EPAP or CPAP) are shown. However, these have a different mechanical meaning. EPAP acts on a certain moment of the ventilation cycle to avoid physiological alveolar collapse and, therefore, recruit alveoli and improve oxygenation. On the other

hand, CPAP acts constantly on the airway throughout the entire ventilation cycle of the patient. That is why we think these 2 values should have appeared separately on the table results.<sup>3</sup>

The definition of success as weaning from ventilation support (non-invasive ventilation) at the hospital emergency unit (HEU) should make us think. In some patients with acute pulmonary edema, weaning from ventilation support in the form of CPAP at the HEU could be considered a success. However, this is not eligible for patients with chronic obstructive pulmonary disease (COPD), especially if this is associated with respiratory acidosis which, in most cases, requires > 12 h of ventilation support. Here success is defined by continuity between the HEU and the patient's next destination. Therefore, we believe that the percentage of patients admitted with ventilation support is a piece of information that should have been collected, never understood as failure but as a treatment continuity.<sup>4</sup>

Diabetes mellitus is quoted by the authors as a risk factor for prolonged non-invasive ventilation at the ER. It would have been interesting to collect variables objectively associated with prolonged ventilation support and technique failure like the oxygenation index (PaO<sub>2</sub>/FiO<sub>2</sub> ratio), the HACOR index, the pH value, respiratory rate, poor secretion control or interphase rejection.<sup>5</sup>

We should mention here the authors' contribution on the need for continuous medical education for healthcare professionals who work at HEUs, availability of resources, and the active participation of ER doctors in multidisciplinary projects like intermediate respiratory care units and «open» or extended intensive care units.<sup>6</sup>

## Conflicts of interest

None whatsoever.

## References

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J.M. Carratalá-Perales<sup>a</sup>, V. Gil<sup>b,\*</sup>, J.A. Andueza<sup>c</sup>

<sup>a</sup> Urgencias y Unidad Corta Estancia, Hospital General Universitario de Alicante, ISABIAL, Alicante, Spain

<sup>b</sup> Àrea d'Urgències, Hospital Clínic Barcelona; "Emergencies: processes and pathologies" Research Group, IDIBAPS, Universidad de Barcelona, Barcelona, Spain

<sup>c</sup> Servicio de Urgencias, Hospital General Universitario Gregorio Marañón, Madrid, Spain

\* Corresponding author.

E-mail address: [vgil@clinic.cat](mailto:vgil@clinic.cat) (V. Gil).

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## Reply to Comments on «Characteristics of prolonged non-invasive ventilation in hospital emergency departments and their impact on efficacy. Analysis of the VNICat registry»



### Respuesta a puntualizaciones sobre «Características de la ventilación no invasiva prolongada en los servicios de urgencias hospitalarios y su impacto en la eficacia. Análisis del registro VNICat»

Dear Editor:

In the first place, we wish to express our appreciation for the comments and interest shown by Gil et al.<sup>1</sup> towards our work.<sup>2</sup> Also, we wish to thank the editor for giving us the opportunity to answer back. Although it is true that the model of ventilator was never included in our study, we do know that they were all specific ventilators for non-invasive ventilation. Also, although the programming of the different parameters involved varies from one model to the next, like they say, the actual ventilation support comes from the support pressure that results from programming. Regarding the EPAP (expiratory positive airway pressure) and CPAP (continuous positive airway pressure) values, their mechanical meaning is different, and it is true that this variable could have been shown separately on the table, which is why we wish to share the results now. CPAP values (cmSH<sub>2</sub>O): mean (SD) was 7.36 (2.20) in the NIV-HEU group (non-invasive ventilation at the hospital emergency unit) < 12 h and 6.71 (1.98) in the NIV-HEU group 12 ≥ h; *P* value = .526; EPAP values (cmSH<sub>2</sub>O): mean (SD) was 6.67 (1.45) in the NIV-HEU group < 12 h and 6.36 (1.12) in the NIV-HEU group 12 ≥ h; *P* value = .223.

The variables associated with the patients' clinical situation and arterial blood gas test were collected. They were grouped by type of acute respiratory failure, spe-

cific arterial blood gas test data, arterial oxygen tension, carbon dioxide, and pH. No significant differences were seen between the 2 groups under comparison. Poor secretion control or interphase rejection were not specifically included.

One of the main aspects of the VNICat registry (Non-invasive ventilation in Catalonia)<sup>3</sup> was that only 17% of the cases recruited (N=27) were referred to hospitalization units with non-invasive ventilation still as part of the ventilation support therapy. This circumstance seems routine at the emergency services like other studies conducted in our setting reveal.<sup>4</sup> Although this situation can be taken as a failure, it is not a technical failure, which is what we assessed in our study, but as an organization failure of the flows of participant centers. Therefore, what we say in our conclusion is of paramount importance, that the flows of these patients need to become standardized based on the resources available to make sure that a proper transition takes place. Actually, let's go one step further. This should not be based on the resources available at all, but, as the go-to health professionals, we need to demand the existence and availability of these resources.<sup>5</sup>

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