



## Pressure support ventilation vs continuous positive airway pressure for treating of acute cardiogenic pulmonary edema. Comment



Dear Editor,

We have read with interest the original article titled "Pressure support ventilation vs Continuous positive airway pressure for treating of acute cardiogenic pulmonary edema", that concludes that PSV is slightly better than CPAP to treat patients affected by acute cardiogenic pulmonary edema.

In this observational, pilot prospective study, the authors enrolled 153 subjects and compared 88 receiving CPAP with 65 receiving PSV (Pagano et al., 2018).

In this article failure with NIV occurred more often in the CPAP group than in the PSV group (11.2% vs 1.5%,  $p = 0.02$ ).

Scientific literature reports a marked benefit regarding the use of NIV in patients with acute cardiogenic pulmonary edema either with continuous positive airway pressure (CPAP) or with two adjusted airway pressure levels. Both CPAP and PSV have demonstrated to be adequate as they improve oxygenation and decrease tachypnea and workload of the respiratory muscles.

We have some remarks on this study that can be valuable for practical implications.

### 1. First

It is important to take into account the variability of NIV devices used in the study. The authors use NIV devices such as Ventukit, Mask of Boussignac, and Monnal T75 Air Liquid Medical System, and Drager Evita. In these devices, the CPAP level is determined by an adjustable and fixed PEEP valve in which the gas flow is basic to sustain a stable airway pressure throughout the respiratory cycle, with variations dependent upon the patient's ventilatory work. The authors do not provide programming parameters of the NIV devices used. An ideal CPAP system used during the ventilatory effort of patients with acute cardiogenic pulmonary edema should maintain pressure stability during the respiratory effort in order to avoid depressurization of the CPAP level. The authors do not provide CPAP adjustments with flow variations in the systems used (especially Ventukit and Boussignac), nor FiO<sub>2</sub> settings with each level of CPAP.

On the other hand, the excessive increase in inspired pressures could increase intrathoracic pressure and decrease venous return. This last

consideration must be taken into account especially when using PSV in which the cardiac index could be significantly impaired (reduced) with high inspired pressures (Yoshida et al., 2012).

### 2. Second

The selection of patients for the comparison group was inadequate given that their clinical characteristics were different.

The authors reveal significant differences regarding respiratory rate ( $p = 0.003$ ) which could indicate a higher ventilatory work load in patients receiving CPAP and that could influence the results when establishing that PSV is better than CPAP in patients with acute cardiogenic pulmonary edema. Furthermore, there is scarce information of clinical parameters that assess ventilatory work (Patrick et al., 1996)

### 3. Third

#### 3.1. Absence of clinical data reporting

The authors do not report the presence of associated comorbidities. Studies of patients with heart failure (HF) have shown that COPD is prevalent in 10–33% and research involving spirometry has shown that 78% of patients diagnosed with HF, could have moderate to severe obstruction which is a major factor to think about in the presence of hypercapnia (Dalsgaard et al., 2017) and should be taken into consideration while receiving NIV.

We consider that an adequate selection of NIV equipment and devices, could be determinant to decrease the ventilatory work, hypoxemia and hypercapnia in patients with acute cardiogenic pulmonary edema and that several clinical factors must also be taken into consideration when trying to establish clinical differences between CPAP and PSV.

### References

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