

Luiz Albert Forgiarini Junior^{a,*}, Antonio M. Esquinas^b

^a Centro Universitário Metodista – IPA, Programa de Pós-graduação em Biociências e Reabilitação, Porto Alegre, RS, Brazil

^b Hospital Morales Meseguer, Unidad de Cuidados Intensivos, Murcia, Spain

* Corresponding author.

E-mail: forgiarini.luiz@gmail.com (L.A. Forgiarini Junior).

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Non-invasive mechanical ventilation after the successful weaning: where are the limits of venturi mask?



Ventilação mecânica não invasiva após o desmame bem-sucedido: onde estão os limites da máscara Venturi?

Dear Editor,

Weaning from mechanical ventilation is one of the most challenging decisions in the Intensive Care Unit (ICU), due to high mortality rate associated with the cases that fail extubation. Moreover, despite successful weaning tests available on average around 20% of the patients will need a reintubation, facing a dramatic decline on their clinical outcomes.

Adiyeye et al.¹ on their study tackle the impact of None Invasive Mechanical Ventilation (NIMV) on the patient's outcome during the weaning process and the extubation period through the comparison with Venturi Mask, As a final disclosure the authors recommend the use of NIMV unless for a minimum of 48 h after extubation due to the noticed reduction on the respiratory failure and the length of stay on ICU.

Nevertheless, after carefully analyzing this study we consider that there are some key practical regards needed to take into account.

First, Adiyeye et al.¹ expand the recommendation for the NIMV not only to the high reintubation risk patients but also to the ones likely to developed an acute respiratory failure requiring a reintubation. This is in opposite direction regarding other previous larger studies based on data from Esteban et al.,² Nava et al.,³ and larger meta-analysis, regarding the none invasive mechanical ventilation role in the postextubation respiratory failure.⁴ Those papers showed benefit on mortality rates only when NIMV applied to selected patients, specifically when underlying cardiac or respiratory disease exists.

Second, only 50 patients were considered, translating in a small group, which probably limits considerably the aftermath. No significant reduction on mortality or reintubation rates was seen. However other studies, Ferrer et al.,⁵ showed a relevant decrease in mortality. These

differences may presumably be because of the small sample size observed. Of note in both of the studies, Adiyeye et al.¹ and Ferrer et al.⁴ agreed on the lack of 90 day survival rates differences among the two groups. But no data on the destination ward type after downgrade from the ICU, for example intermediate, telemetry or regular medical wards. As seen in our daily practice, the transition to plain medical wards sometimes is poorly tolerated. No data available to confirm nor denied the hypothesis but maybe this aspect should be taken into account when thinking on the 90 day survival rate.

Third, the study lacks to mention patient's underlying clinical conditions. Bearing in mind that three out of the four main NIMV indications are Acute on chronic respiratory failure, cardiogenic respiratory edema and weaning from ventilator, it would be logical to think of those special NIMV benefits and applying them to the patients with underlying cardiac or respiratory disease, along the weaning process.

As seen in the recent paper from Thille et al.,⁶ the implementation of prophylactic NIMV protocols after extubation may reduce the reintubation rate when those requirements are met. On the cardiac side the authors admitted a wide range of cardiovascular entities (valvulopathies, ischemia, arrhythmic diseases) having all of them in common the acute cardiac failure. The positive pressure ventilation effects on hemodynamics, when the patient is properly hydrated, is to improve the left cardiac output through the increase on pre-load and the decrease after-load, so reinforcing the cardiovascular balance and eliminating one of the potential causes of failure to weaning and reintubation. As seen on the paper, in these type of patients, the weaning process uses the Pressure-Support (PS) modality rather than T-piece, without losing the positive pressure effects on the cardiac outcome, even for a little time, and then increasing the weaning success. Looking at the side dealing with respiratory conditions, we find chronic lung diseases, obstructive, restrictive, even obesity-hypoventilation syndrome which belongs to the natural NIMV framework for the respiratory support. So using the non invasive mechanical ventilation on the weaning and later on, we offer a "soft landing" to the ill lung after the intubation period, and doing so once again, we reduce significantly the reintubation rate.

We agree that further and larger clinical research is demanded, to elucidate the role of complete NIMV in the clinical evolution of the patient along the post-extubation stage.

Conflicts of interest

The authors declare no conflicts of interest.

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Jacobo Bacariza Blanco^{a,*}, Antonio M. Esquinas^b

^a *Hospital Garcia de Orta EPE, Unidade de Terapia Intensiva, Almada, Portugal*

^b *Hospital Meseguer, Unidade de Terapia Intensiva, Murcia, Spain*

* Corresponding author.

E-mail: jacobobacariza@hotmail.com (J.B. Blanco).

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Noninvasive ventilation after extubation



Ventilação não invasiva após a extubação

Dear Editor,

We read with great interest the study by Adiyeye et al.¹ In their prospective work, they describe a very important reduction of post extubation respiratory failure and a huge improvement in intensive care unit length of stay provided by systematic prophylactic Non Invasive Ventilation (NIV) after extubation.

Nevertheless, some methodological flaws, somewhat limiting the conclusions, have to be underlined. First, the authors did not precisely describe the population. Therefore the number of patients harboring high risk of extubation failure does not appear in the article. Nevertheless, as stated by the authors, recent data suggest that prophylactic NIV is only useful in this subset of patients. Therefore, the principle of equipoise does not appear to be respected, meaning that the foreseeable need for the tested intervention might not have been taken into account, and that some patients with clear cut indication for the tested intervention might have been randomized in the group not providing it. This is further strengthened by the unexpectedly high rate of respiratory failure in the Venturi Mask Group. As a matter of fact, one may suggest that such a high incidence (i.e. 56%) of post extubation respiratory failure is unlikely to occur in a group of patients harboring low risk of extubation failure. Second, in most of the recent studies in the field, extubation failure incidence ranges between 10% and 20%. It has to be stressed that the small cohort described in the study was very unlikely to be powered enough to describe a significant effect of the described intervention, at least in a general ICU population.

This may suggest that whether the included population harbored specific, albeit non described, characteristics, or the effect of chance. Third, despite authors' enthusiastic evaluation of NIV use as a first line treatment in post extubation failure, it has to be kept in mind that well designed studies displayed different conclusions. Indeed, in their prospective randomized study, Esteban et al. evidenced a higher rate of in ICU death in the subgroup of patients systematically treated with NIV support requiring subsequent intubation after extubation failure.² Though NIV in post extubation failure could be beneficial in some specific setting (chronic obstructive pulmonary disease for instance), the estimated etiology of post extubation respiratory failure is not provided in the article. Therefore, we think that providing NIV to every patients experiencing post extubation failure remains a matter of debate. Altogether, though NIV remains one mainstay in extubation success, we think that current evidence remains to be followed, with the screening of patients who may benefit of this tool made before extubation for the prophylactic NIV, and the "rescue" NIV in case of post extubation failure discussed on case by case analysis.

Conflicts of interest

The authors declare no conflicts of interest.

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