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لم ترد بالأصل

Weaning outcomes of using post-extubation high flow nasal oxygen versus continuous positive airway pressure in acute exacerbation of chronic obstructive pulmonary disease patients.

A Thesis
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قالوا

سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم

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Mustafa Kamel Abd El Fatah

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List of Abbreviations

ABG	:	Arterial Blood Gases.
ARDS	:	Acute respiratory distress syndrome.
ATC	:	Automatic tube compensation.
ACCP	:	American College of chest physicians
BiPAP	:	Bi-level positive airway pressure.
COPD	:	Chronic obstructive pulmonary disease patients.
CPAP	:	Continuous positive airway pressure.
DNI	:	Do-not-intubate.
FiO2	:	Fraction of inspired oxygen.
HFNO	:	High-flow nasal oxygen therapy.
HR	:	Heart Rate.
ICU	:	Intensive care unit.
IPF	:	Idiopathic pulmonary fibrosis.
IWI	:	Integrated Weaning Index.
MAP	:	Mean Arterial Blood Pressure.
MV	:	Mechanical ventilation.
NIV	:	Noninvasive ventilation.
NPPV	:	Noninvasive positive pressure ventilation.
O2	:	Oxygen therapy.
OSA	:	Obstructive sleep apnea.
PEEP	:	Positive end-expiratory pressure.
PSV	:	Pressure support ventilation.
RCTs	:	Randomized controlled trials.
SBT	:	Spontaneous breathing trial.
SIMV	:	Synchronized intermittent mandatory ventilation.
VAP	:	Ventilator-associated pneumonia.
VT	:	Tidal volume.

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Introduction

Mechanical ventilation (MV) is a major treatment of life-threatening conditions, but weaning from MV remains a great challenge, and time of extubation is a critical issue in the intensive care unit (ICU) management (***Schmict GA, et al., 2017***).

ICU clinicians have to clearly distinguish the weaning phase from extubation period to best identify their respective mechanisms and risk factors for failure. Indeed, weaning difficulties [failure of one or more spontaneous breathing trial] occur in 19% of ICU patients according to a recent new definition of weaning outcome, and ICU mortality can reach up to 21% in these patients (***Béduneau G, et al., 2017***).

In addition to standard oxygen therapy, two other non-invasive techniques have been proposed for the weaning/post-extubation management: high-flow nasal oxygen therapy (HFNO) and non-invasive ventilation (NIV), Apart from NIV used as a weaning strategy ***(Glossop AJ; et al., 2012)*** preventive post-extubation NIV appears to be of clinical benefit mainly in medical population considered at risk for extubation failure ***(Thille AW; et al., 2017).***

HFNO has been recently demonstrated to be beneficial on clinical outcome in severe hypoxemic patients ***(Frat JP; et al., 2015).*** HFNO has also been recently assessed as a preventive post-extubation ventilatory

support. Compared to conventional O2, HFNO has been shown to improve oxygenation and respiratory comfort, decrease the need for reintubation and post-extubation NIV in a general ICU population (***Maggiore SM; et al., 2014***) In patients at low-risk for extubation failure, HFNO has also been demonstrated to decrease post-extubation and reintubation rate within 72 hours (***Hernández G; et al., 2016***).

As yet, nevertheless, no study has applied post-extubation HFNO in high-risk patients for extubation failure nor compared HFNO with NIV in this setting. Studies have previously suggested a potential benefit of HFNO compared to standard O2 in the post-extubation management (***Maggiore SM; et al., 2014***).

However, hypercapnic patients during the SBT arguing that physicians preferred using preventive NIV in this situation and the uncertain role of HFNO in managing hypercapnia. Indeed, preventive post-extubation NIV seems particularly effective in selected medical population with chronic pulmonary diseases and underlying hypercapnia during SBT (***Ferrer M; et al., 2009***).

Such a benefit has also been demonstrated with NIV used as a weaning technique in chronic obstructive pulmonary disease (COPD) patients (***Burns KE; et al., 2014).*** Among the numerous factors considered at risk for extubation failure which may affect a very large population in ICU, hypercapnia during SBT appears to be, in fact, one of the most objective and discriminant criterion to propose