



## LETTER TO THE EDITOR

# Pressure-controlled ventilation and sleep in COPD patients in the intensive care unit: The role of tidal volume?



To the Editor,

Assessment of sleep in critically ill patients has attracted great interest in recent years [1]. We know from previous studies that assisted controlled ventilation (ACV) mode is associated with better sleep quality compared to low and high pressure support ventilation (PSV) [2].

In the recent study by Andr  jak et al., the investigators evaluated the effect of pressure control ventilation (PCV) versus low PSV in patients with known chronic obstructive pulmonary disease (COPD) and acute-on-chronic respiratory failure [3]. The authors reported better sleep quantity and quality with PCV compared to low PSV. However, there are a few points that need to be discussed to have a better understanding of the reported results:

First, surprisingly, the tidal volume ( $V_T$ ) in PCV was high compared to the values that are currently recommended in patients with COPD [4]. Despite the fact that  $V_T$  was higher during PCV, minute volume ( $V_E$ ) during PSV was higher than the  $V_E$  during PCV. This high ventilatory volume might have induced hypoventilation or central apneas during sleep, which in turn might have disturbed sleep during PSV [5]. As respiratory pattern was not monitored during sleep, this possibility cannot be ruled out.

Secondly, lack of end-tidal carbon dioxide ( $EtCO_2$ ) monitoring made it difficult to assess the impact of each mode of ventilation on the ventilatory status during sleep. Future studies should monitor  $EtCO_2$  or transcutaneous carbon dioxide tension ( $TcpCO_2$ ) during sleep. Monitoring of capnographic signal during the study will clarify the status of ventilation during sleep [6].

Third, Karakurt et al. reported that PCV was associated with longer weaning hours in COPD patients compared to ACV [7]. In case of equal efficacy of both ventilatory modes on sleep architecture, the intensivist should choose the mode that provide faster and easier weaning.

In view of the potential detrimental effects of alternations in sleep on the critically ill patient, large prospective multicenter studies are needed to clarify this important area.

## Conflict of interest statement

Authors declare that have not any potential for conflict of interest.

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## Abbreviations

ACV: assisted controlled ventilation;  
COPD: chronic obstructive pulmonary disease;  
 $EtCO_2$ : end-tidal carbon dioxide tension;  
PCV: pressure control ventilation;  
PSV: pressure support ventilation;  
 $TcpO_2$ : transcutaneous carbon dioxide tension;  
 $V_E$ : minute volume;  
 $V_T$ : tidal volume

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