


Tidal volume during mouthpiece non-invasive home ventilation: When the choice is the right answer

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Dear Editor,

Mouthpiece ventilation (MPV) modes are being introduced to available portable home ventilators (HMVs) by software, allowing insufflation to be triggered only by the positioning of the patients lips.¹ However, during HMV, there are remarkable technical problems (low-pressure alarms) in setting up MPV mainly when circuit pressure drops.²

We have read with great interest the study by Oagna et al.³ who have highlighted that when a respiratory rate was set on the ventilator, after circuit disconnection, the delivered volume was lower than expected. This resulted from a tidal volume (V_T) overshoot during the circuit disconnection, causing a downregulation of the ventilator's working pressure in the subsequent cycles. After reconnection to the mouthpiece, the delivered V_T was lower than the set V_T until the ventilators compensated. Astral 150 and PB 560 need less than two respiratory cycles, while Trilogy 100 and VentiLogic LS need up to seven respiratory cycles.

In this scenario, we consider that there are some key technical aspects to take into account.

First, it is necessary to know that the use of a barometric ventilation mode reduces the drop in delivered V_T at the moment of the circuit reconnection.³

Second, the use of volume-assisted ventilation mode without minimal respiratory frequency reduces the phenomenon of rise and fall of the V_T in Trilogy 100 and VentiLogic LS. The MPV volumetric mode of VentiLogic LS is a volume-cycled barometric mode with the rapidity in adjusting V_T delivery, and it does not ensure a set V_T .³ Trilogy 100- and VentiLogic LS-dedicated MPV mode showed the poorest performances in the controlled modality. In the assisted setting, the Trilogy 100 MPV mode showed good performances, while VentiLogic LS MPV mode

counterbalances the reduction in V_T with a 35% V_T overshoot.³ The Astral 150 has no MPV mode, but there is a possibility to set the respiratory backup rate to zero and to customize the alarms and showed good performances as PB 560 in both the controlled and the assisted setting. The VIVO 60 was slower in adapting to the changing load conditions.³

Third, the choice of the ventilator should take into account the advantages and limitations of each machine. For example, the MPV-dedicated mode without backup respiratory rate may be beneficial in less-dependent patients (frequent disconnections), while the severe ventilator-dependent patients may take greater advantage of a more reactive ventilator, with greater rapidity in adjusting V_T .³

Finally, the specificities of MPV (intermittent disconnection and continuous leaks) may thus represent a challenge for turbine-based HMVs. Oagna et al.³ help caregivers to recognize the potential problems related to MPV set-up. Their data show large differences in the capacity of the different life-support ventilators to deal with the rapidly changing respiratory load features, which can be further accentuated according to the choice of ventilator settings. We consider that this has practical consequences, since the choice of the ventilator to be used for MPV in a specific patient should also contemplate the advantages and

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limitations of each machine, which depend on the planned ventilator mode.

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