Author’s response to reviews

Title: Impact of leaks and ventilation parameters on the efficacy of humidifiers during home ventilation for tracheostomized patients: a bench study.

Authors:
Noemie Haziot (noemie.haziot@aphp.fr)
Mohamed Ibrahim (mohamed.ibrahim@alehos.fr)
Kaixian Zhu (kaixian.zhu@alehos.fr)
Charles Philippe Thevenin (charles-philippe.thevenin@alehos.fr)
Sebastien Hardy (sebastien.hardy@alehos.fr)
Jesus Gonzalez Bermejo (jesus.gonzalez@aphp.fr)

Version: 2 Date: 11 Feb 2019

Author’s response to reviews:

Reviewer reports:

Masaji Nishimura (Reviewer 1): In the study, Haziot et al. compared humidification performance of five heated humidifiers under several respiratory conditions. Revised manuscript is better than original one, however there still are several important issues in the study.

Response of hygrometer is 30 sec. So when humidity changes 0 to 30, your hygrometer exhibits correct value at 30 second after the signal. Humidity changes according to inspiratory flow. All hygrometer has this limitation, and we should be careful to evaluate data of hygrometer. I don't think the authors understand the limitation. I am sure the reaction time has significant impact on the measurement. The aim of the study was to make it clear if leak or tidal volume influenced humidity. Even vapor output from humidifier is stable (it is not actually stable), humidity fluctuated according to flow, so reaction time has significant impact on the measurement. As the authors claimed, humidity is stable and reaction time has little impact, leak should have not had any impact on humidity.

At least the authors should describe reaction time of the hygrometer in the text.

Thank you for your comment.

Indeed, the two hygrometers we used (Testo 635 and Testo 645) both have a long response time (30 seconds) as you have noticed. We added this information in “Materials and methods” section, pages 5 and 6.
We agree that this response time is too long to detect inspiratory humidity during respiratory cycle. What is detected is an average humidity in the respiratory circuit and that both inspiratory and expiratory gases influence measurements.

However, the purpose of our study was to measure and compare the humidity in the respiratory circuit when it become stable (after a 5-minute plateau) and not to separate the inspiratory and expiratory humidity. We believe that the average humidity we measure can be representative of the humidity in the respiratory circuit during long term mechanical ventilation.

We added this part in our “Discussion” section, page 12.