

Malfunction of heat and moisture exchanger filters: Causality or unresolved problem?

Dear Editor,

We read with great interest the case report by Bajwa, *et al.*^[1] The authors highlight the seriousness of HMEF malfunction leading to airway obstruction that could result in catastrophic patient outcome, especially during anesthesia for operative procedures. It is also concerning that such device malfunctions may seldom trigger an alarm, which is intended to alert the anesthesiologist. Fortunately, the expertise and clinical acumen of the anesthesiologists caring for the patient had saved the day.

There are many causes which may determine a loss of HMEF efficiency such as described by the authors.^[2] Several

published articles describe the deleterious effects such as barotrauma and variable loss of humidification.^[2-4]

We have carefully read this article on complications associated with HMEF malfunction.^[1] If these malfunctions are considered to be rare and unusual, still are under-recognized and unnoticed, leading to serious harm to the patient. The use of HMEF and its associated malfunction is still a matter of debate among anesthesiologists. Currently there is not epidemiologic or clear information about this topic and clinical implications.

First, we agree with the authors that this paper highlights the lack of automatic detection systems for malfunctioning disposable devices that are added to the breathing circuit.^[1] This raises the need for incorporating alternative detection alarms and even international policy. At present, only heated humidifiers have alarms for their malfunction and the detection alarms are still lacking for other MME devices. This is crucial point during prolonged mechanical ventilation^[5] and monitoring ventilatory parameters.^[6]

Second, there are not any available clinical protocols or training manuals to evaluate HMEF efficacy, or identify its potential manufacturing defects prior to clinical application.^[2-4] Our recommendations to authors is that only a preventive strategy with meticulous attention to both disposable and non-disposable equipment used, could avoid a life threatening circumstance in the operating room, weaning^[5] and prolonged mechanical ventilation.^[7, 8] Third, our recommendations are that HME should incorporate a system of effective humidity, internal resistance and integrity along with a detection system when they fail.

Our key home messages in this study are a) this is an unresolved technical and clinical problem. b) Qualitative survey of practicing anesthesiologists would provide more insight in to the prevalence of what appears to be an 'unusual' occurrence of a very serious HMEF malfunction and c) upcoming trials should incorporate aspects of safety on humidification devices utilized.

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