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Case Report

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Unusual Ventilator Failure - a Hazard Report

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Abstract

The unusual expiratory valve damage in a ventilator used for prolonged duration is a very rare entity. The audio visual safety alarm system and end tidal carbon dioxide monitoring did help in diagnosing the problem. Thus saving the life of a patient.

Case Study

In critical care area it is a common practice to continue the ventilation without doing pre-check due to increase work load or due to increase number of cases requiring ventilator support or lack of ventilator due to high cost. Sometimes even after the pre use check, prolonged use of ventilator on a particular patient may lead to malfunctioning of ventilators which may be difficult to notice without safety alarms.

In our case, a patient with organophosphorus patient was intubated and was on ventilator (Drager, Savina 300, pre use check was performed) for a week. On eighth day the ventilator was giving alarm as high PEEP, and end tidal concentration (EtCO2) rose to 75 mmHg. The arterial blood gas analysis also showed PaCO2 of 70 mmHg with PaO2 levels of 175 at FiO2 of 0.60 (**Figure 1a**).

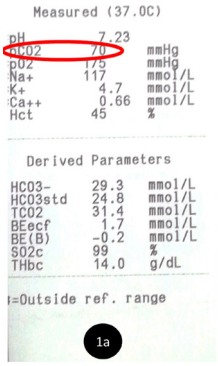

Figure 1a

With high index of suspicion ventilator malfunction was diagnosed and replaced with standby ventilator (Drager, Savina 300). With that arrangement the ventilation was good and ETCO2 and PaCO2 got normalized. On self-device check of the first ventilator the expiratory valve failure was notified (**Figure 1b**).

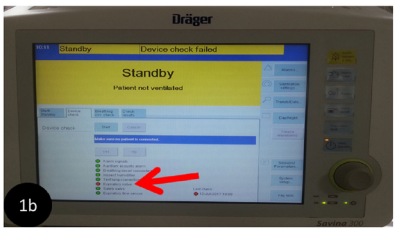

Figure 1b

On inspection the silicon part of the diaphragm was damaged (**Figure 1c**) and the same was replaced with new one. The device check was again performed and did pass all the tests. The expiratory valve in anesthesia workstation is visible thus damages are easily recognized [1]. Like in anesthesia machines regular safety pre use check is mandatory in critical care area ventilator and one should not use it directly on the patient. There is no international guideline which recommends how frequently the ventilator has to be checked if used for prolonged duration. The audio visual safety system in Drager savina 300 did save our patient from being rebreathing and thus morbidity or mortality. It is a good practice to keep a high index of suspicion, in our case the EtCO2 monitoring in critical care unit also contributed in suspecting the problem. Before the equipment is used on any patient complete device check should be done and hospital should adopt such protocols.

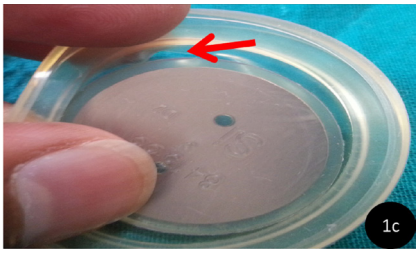

Figure 1c

References

1. Shetti AN (2013) Damaged expiratory valve: A missed mishap!! Anesth, Essays and Res 7: 421-422.