Reducing Aerosol Generation During Ventilator Weaning in a Coronavirus Disease 2019 Patient Using a Supraglottic Airway: A Case Report

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We report weaning from mechanical ventilation with no coughing in a patient with coronavirus disease 2019 (COVID-19). Substituting the endotracheal tube for a supraglottic airway (SGA), which is less stimulating to the trachea, can reduce coughing with weaning from mechanical ventilation and extubation. Personal protective equipment is in short supply worldwide. Reducing spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is beneficial in terms of occupational health of health care workers. (A&A Practice. 2020;14:e01247.)

GLOSSARY

COVID-19 = coronavirus disease 2019; **Fio_2** = fraction of inspired oxygen; **SARS-CoV-2** = severe acute respiratory syndrome coronavirus 2; **SGA** = supraglottic airway

An outbreak of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has emerged globally and also in Japan.[1] Patients with severe respiratory failure are treated primarily with mechanical ventilation.[2] There is a risk of exposure to the virus not only during intubation but also during extubation.[3,4] At the time of extubation, straining and coughing occur and may spread droplets and aerosols containing the SARS-CoV-2 virus.[4,5] However, documented procedures for decreasing coughs at the time of extubation in the intensive care unit are limited. Decreasing coughs is essential for reducing virus transmission in this phase, especially with the limited supply of personal protective equipment. We conducted a weaning procedure from mechanical ventilation in advance of emergence from sedation in a patient with COVID-19 by exchanging the tracheal tube to a supraglottic airway (SGA), which is associated with fewer coughs.[6,7] We describe a patient with COVID-19 who was mechanically ventilated and weaned from the ventilator with no coughing. We consider this procedure beneficial in terms of occupational health for health care workers because it enables the patient to avoid straining at extubation, which is aerosol generating. The patient provided written, informed consent to share his clinical details.

CASE DESCRIPTION

A 70-year-old man had a fever 4 days before admission to a community hospital. A week after admission, his respiratory status deteriorated, and he was transferred to our university hospital. Two days after admission, he was intubated with an 8.0-mm tracheal tube with rapid sequence induction with a conventional Macintosh laryngoscope. The Cormack–Lehane classification of the laryngoscopic view was grade I. He had 10 days of mechanical ventilation under sedation. On the day of weaning, the ventilator settings were continuous positive airway pressure of 6 cm H_2O with pressure support 6 cm H_2O, fraction of inspired oxygen (Fio_2) of 0.25. He passed a spontaneous breathing trial successfully with tapered sedation. He was then sedated and paralyzed with intravenous fentanyl 150 μg, propofol 80 mg, and rocuronium 20 mg. The tracheal tube was replaced with an SGA i-gel (Intersurgical, Berkshire, United Kingdom) with no coughing. Adequate ventilation was confirmed, and sedatives were discontinued. The patient regained spontaneous breathing and was ventilated with continuous positive airway pressure with pressure support. When the patient had emerged from sedation, the ventilator was disconnected, and the SGA removed. The patient was fully awake and had no straining or coughing during the entire weaning procedure from mechanical ventilation.

DISCUSSION

Safety for health care workers is crucial for maintaining continued care for patients with COVID-19. Health care workers have been infected following the intubation of patients with SARS-CoV-1 and SARS-CoV-2.[3] Currently, personal protective equipment such as masks, gowns, and face shields is in short supply globally. Countermeasures against occupational infection include limiting the number of staff members at the procedure and shielding aerosols with intubation boxes. We advocate decreasing occupational infection of COVID-19 with multilayered measures. Reducing patients' coughing

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and avoiding this aerosol-generating procedure during tracheal extubation may reduce occupational infection.

SGAs are often used in airway management during general anesthesia and in prehospital settings. SGAs are known to exhibit ease of insertion and proper sealing of the glottic aperture.[8] SGAs do not have direct contact with the inner trachea, thus less likely to induce coughs and straining compared to tracheal tubes.[9,10] This feature of SGAs is favorable in emergence from sedation. During the transfer from an endotracheal tube to an SGA, patients should be sedated and paralyzed to avoid coughing.

Many hospitalized patients with COVID-19 are mechanically ventilated, thus increasing the number of expected extubations. To reduce the risk of occupational infection with SARS-CoV-2 at the time of weaning from mechanical ventilation, we propose replacing the tracheal tube with an SGA such as i-gel before emergence from sedation to reduce environmental distribution of the virus.

DISCLOSURES

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