Use of non-invasive ventilation for patients with COVID-19: a cause for concern?

The potential for transmission of coronavirus disease 2019 (COVID-19) from patients to health-care workers has caused concern, particularly among patients requiring advanced respiratory support, high flow rates of oxygen, or aerosol-generating procedures. The notion that patients with known or suspected COVID-19 with respiratory failure should be intubated and ventilated early in the disease course without the option for less invasive treatments, including continuous positive airway pressure (CPAP) or non-invasive ventilation (NIV), has been suggested. However, WHO guidelines for the management of respiratory failure in COVID-19 advocate the use of CPAP or NIV, provided that appropriate personal protective equipment (PPE) is worn.[1]

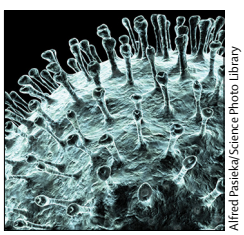
Early intubation of a patient with known or suspected COVID-19 with respiratory distress could result in the intubation and mechanical ventilation of patients who would have otherwise improved on CPAP or NIV, and the unnecessary intubation of patients who are initially suspected to have COVID-19 but test negative for the virus. Additionally, unnecessary intubation and ventilation of one patient might deny what might be life-saving treatment for another patient in resource-limited settings. Resorting to less invasive respiratory support when the capacity for mechanical ventilation has been reached could also raise anxiety among many staff, who might believe that they are being exposed to a high-risk procedure due to a scarcity of health-care resources.

Of 138 patients who were hospitalised with confirmed COVID-19 in Wuhan, China, in January, 2020, 40 (29%) patients were health-care workers who were presumed to have contracted the virus in hospital.[2] Of these health-care professionals, 31 (78%) worked on general wards, 7 (18%) in the emergency department, and 2 (5%) in the intensive care unit (ICU).[2] The risk of transmission was highest among health-care workers who had been exposed to patients with COVID-19 with low clinical suspicion and, therefore, were unlikely to have worn PPE.

A good interface fitting for CPAP or NIV systems minimise widespread dispersion of exhaled air and, consequently, should be associated with low risk of airborne transmission from patients. With the use of PPE on the ICU, use of NIV during the severe acute respiratory syndrome epidemic was not associated with an increased risk of transmission of the virus to health-care workers; whereas, endotracheal intubation was associated with an increased risk of aerosolisation and infection of health-care workers.[3] The notion that early intubation avoids use of CPAP or NIV, therefore decreasing risk of viral transmission with the use of PPE, is debatable.

We also challenge the notion that NIV only temporarily improves oxygenation and breathing in these patients, without necessarily changing the natural disease course. In patients with Middle East respiratory syndrome and acute hypoxaemic respiratory failure, NIV failure was high and was not associated with improved outcomes.[4] However, the clinical severity and mortality from Middle East respiratory syndrome was markedly greater than from severe acute respiratory syndrome or COVID-19. In a series of 20 patients with severe acute respiratory syndrome, endotracheal intubation was avoided in 14 (70%) patients with the use of NIV.[5]

We accept that the risk of COVID-19 transmission to health-care workers is not negligible and that many health-care workers have been infected at work. The solution is to keep health-care workers safe, thereby facilitating the provision of best patient care.



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MS and DB are involved in the development in a not-for-profit open source continuous positive airway pressure device. NA and DH declare no competing interests.

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