Updated Guidance on Aerosol-Generating Procedures

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During the SARS outbreak, noninvasive ventilation (NIV) was reported to increase the likelihood of SARS infection in nurses by nearly two fold.[1] Since then, NIV has been considered as an "aerosol-generating procedure (AGP)."[2,3] Hui et al implemented a series of studies that utilized smoke technology via patient simulators to visualize smoke dispersion and distance during NIV therapy. These studies demonstrated that smoke dispersion distance was 0.28-1 meter, and the distance was particularly large (1 meter) when a vented mask was applied.[4-6] At the beginning of the COVID-19 pandemic, NIV was not recommended. Because NIV may play a role in caring for patients in hypoxemic or hypercapnic respiratory failure due to COVID-19, perhaps it is time to reevaluate these recommendations. AGPs are defined as procedures that promote patients to generate infectious bioaerosols by cough induction or stimulation. NIV does not stimulate patients to cough or promote bioaerosol generation. Instead, it disperses patient bioaerosols.[7] The bioaerosol dispersion mechanism was validated by a study conducted by Gaeckle et al. They compared aerosol particle concentrations generated by healthy volunteers during the utilization of different oxygen delivery devices, including NIV. There were no differences between being on no devices (breathing room air) and being on different oxygen devices in regards to bioaerosol particle generation. In fact, they found slightly lower concentrations of bioaerosol particles with NIV than breathing at room air or low-flow nasal cannula at 4 L/min.[8] Therefore, a more appropriate way to describe NIV, in the context of bioaerosol generation, might be "aerosol dispersing procedure" rather than AGP. [7,9] Importantly,

a patient who can remove or displace the mask and can cough, represents a far greater source of aerosol. Caregivers should continue to wear the required PPE.

The use of NIV in COVID-19 hypoxemic respiratory failure has had variable success and the decision to use NIV should be driven by efficacy versus AGP concerns.

References

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