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# Travel Medicine and Infectious Disease

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## Correspondence

### Airborne particle dissemination during tracheotomy for critically ill patients with COVID-19



Dear Editor,

During COVID-19 pandemic, intensive care units (ICUs) of many hospitals have had to increase their number of beds quickly and exponentially. Moreover, the number of orotracheal intubations has increased to the same extent, requiring in most cases prolonged invasive mechanical ventilation. Tracheotomy has showed a relevant role promoting weaning of mechanically ventilated patients with COVID-19 [1].

However, safety of healthcare workers when performing such a high-risk aerosol generation procedure is a matter of concern. Several authors do not recommend tracheotomy in patients with a recent RT-PCR positive result, as COVID-19 might be very contagious [2].

Airborne particulates may include viable airborne viruses. Therefore, avoiding or shortening exposure to airborne particulates is crucial to reduce the risk of contamination of healthcare workers [3]. Moreover, if tracheotomy is beside performed in the ICU, measure of airborne particulates is of great interest to establish a safety area to perform such procedure.

The aim of the present study was to determine whether particle counting could predict airborne particle dissemination around the ICU beds of COVID-19 patients during tracheotomy.

In our University Hospital, twenty-seven COVID-19 patients underwent a tracheotomy [4]. We have prospectively evaluated airborne particle dissemination before, during and after tracheotomy was done in COVID-19 patients. Airborne particulates (particles 0.3  $\mu\text{m}$  in size) were counted by means of PC 200 Particle Counter®, and expressed as numbers of particles per  $\text{m}^3$  (Fig. 1) [5].

We were able to perform consistent and valid measures in 5 cases (Table 1), showing how airborne particle dissemination increased during the surgical procedure. Indeed, it was increased in all cases during tracheal incision, at the moment of maximal contamination, despite mechanical ventilation was disconnected during 75 seconds to avoid gas forced exhaling. Our measures also showed that airborne particle dissemination was strongly reduced 4 m away from the bed of the patient.

With this study, we have shown that airborne particle dissemination increases during tracheotomy. Practicing this procedure bedside in the

ICU is possible, but care should be taken to limit healthcare workers presence to those that are essential, using the best PPE available, and avoiding the presence of other patients or workers nearby.

#### Declaration of competing interest

No potential conflict of interest was declared.

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**Fig. 1.** Airborne particulates were counted by means of PC200 Particle Counter® at the same distance from the neck of the patients.

**Table 1**

Airborne particulates (particles 0.3  $\mu\text{m}$  in size) expressed as numbers of particles per  $\text{m}^3$  before, during and after tracheotomy.

	Before Tracheotomy	Starting Tracheotomy	Tracheal opening	Ending Tracheotomy
Case 1	4441	6435	6663	1200
Case 2	2084	1203	4972	1011
Case 3	1011	3275	4972	1203
Case 3	730	830	5970	1574
Case 5	2084	3604	6986	1604
Average	2066.5	3069.4	5644.3	1247.0