More awareness is needed for severe acute respiratory syndrome coronavirus 2019 transmission through exhaled air during non-invasive respiratory support: experience from China

To the Editor:

As of 17 February, 2020, China has 70 635 confirmed cases of coronavirus disease 2019 (COVID-19), including 1772 deaths [1]. Human-to-human spread of the virus *via* respiratory droplets is currently considered to be the main route of transmission. However, exhaled air dispersion during non-invasive respiratory support may increase the risk of coronavirus transmission, and requires more attention from medical personnel and patients.

According to the Chinese Centre for Disease Control and Prevention [2], among 72 314 reported cases in mainland China (44 672 confirmed cases, 16 186 suspected cases, 10 567 clinically diagnosed cases, and 889 asymptomatic infected cases) as of 11 February, 1716 medical staff were infected. Notably, Wang *et al.* [3] analysed the clinical characteristics of 138 hospitalised cases with COVID-19 and found that the nosocomial infection rate in the study was about 41.3%, with 17 inpatients and 40 medical staff. Given the high use of respiratory support to treat dyspnoea and respiratory failure induced by COVID-19, viral transmission through exhaled air should be considered.

When oxygen is delivered through nasal catheter, mask or non-invasive ventilation (NIV), substantial exhaled air is released into the air, which can increase dispersion of the virus, and subsequently increase the risk of nosocomial infection [4]. Prior studies have suggested that the application of high-flow nasal cannula (HFNC), NIV through the specific mask with optimised vent holes or the helmet with a double-limb circuit may lower the risk of airborne transmission [5, 6]. Performing non-invasive respiratory support in a single, well-ventilated, negative pressure ward is also considered a safe option. Currently, however, the majority of patients are still receiving respiratory support through nasal catheter or common mask in general wards or emergency departments with limited medical resources. The potential for airborne transmission in this population has not received enough attention. Furthermore, a significant proportion of suspected patients with mild to no symptoms who are managing at home may also require long-term home oxygen or NIV treatment (*e.g.* patients with advanced staged COPD). These patients may increase the risk of family cluster infections by the widespread dispersion of exhaled air in their homes.

Non-invasive respiratory support plays an essential role in the treatment of COVID-19, and more awareness is needed regarding the increased risk of viral transmission from exhaled air. Medical staff should utilise personal protective equipment when providing respiratory support therapy. Patients should wear a medical mask when receiving conventional oxygen therapy or HFNC in order to reduce air dispersion. When performing NIV therapy, because helmet resources are limited and they are not frequently used in routine clinical practice, we suggest avoiding masks with vent holes and adding a filter between the mask and the vent valve to reduce viral transmission. Patient beds should be at least 1 m from one another and the ward air circulation rate needs to be increased [7]. For patients with suspected COVID-19 infection receiving long-term respiratory support at home, it is recommended that they stay in a single, well-ventilated room to avoid potentially infecting their family members.

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Reference

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