Coronavirus disease (COVID-19) is a contagious disease spread by a new coronavirus type. Most people with COVID-19 show a mild respiratory disease and recover without any need for special treatment. However, sometimes, some people show severe symptoms that can even lead to their death (Dargahi et al. 2021a, b; Karami et al. 2021b; Vosoughi et al. 2021). At the beginning of the SARS-COV-2 pandemic, there were conflicting reports as whether the new coronavirus can be transmitted via air or not. Some studies suggested that the new coronavirus can be airborne and these studies were preliminary and contradicted other studies. Sampling by Vosoughi et al. were performed for evaluating airborne potential of COVID-19 virus in the corona wards of the hospital (Karami et al. 2021a).

Readers’ questions

The original paper (Vosoughi et al. 2021) claims that all the air samples were negative in term of SARS-CoV-2 by an impinger containing 15 mL of culture medium with a flow rate of 28 L/min and sampling time of 50–60 min. In view of this, we thank the authors for their contribution to the scientific literature on the matter. However, despite this gratitude, we believe that the air sampling method from Vosoughi et al. (2021) are fundamentally flawed and is not transparent for other researchers.

One of the main reasons that all samples were negative in Vosoughi et al. (2021) study can be resulted from high flow rate. Moreover, they did not mention that air sampling was performed before or after disinfection in the hospital wards. Additionally, in this study, the type and volume of the impinger are not specified. Based on our knowledge and experience, by applying 28.3 L min$^{-1}$ flow rate, the culture medium will be instantly sucked from inside the impinger into the sampling pump. In the Vosoughi et al. (2021) study, air sampling was done with this flow rate for 50–60 min, which is practically impossible (the reported condition was examined in our air laboratory). We believe that the air sampling method in Vosoughi et al. (2021) study is not flawless, and therefore, the conclusions they have drawn are not supported.

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The response to the questions

Thanks to the dear readers who asked the good questions.

For this study, we did the air sampling in the corona wards of the hospital. To do this, previous studies for viruses sampling in air, especially the coronavirus, have been used as a guide. In the studies of Kenarkoohi et al. (2020) and Masoumbeigi et al. (2020), as the readers mentioned, the flow rates of 12 and 40 L/min have been carried out for air sampling for COVID-19 virus. In both studies, special suction pumps were used. It should be noted that some viruses may exit from the impinger environment at high flow rates; however, the amount of air sucked per unit time increases, which helps to collect more viruses in short time. The problem of liquid suction into the pump can be solved by selecting a larger volume and higher height of the impinger. Various studies have shown that despite the low flow rate of the pumps, the air samples are still negative for coronavirus. Therefore, the reason for the negative air samples in our study is most likely related to the lack of transmission of this type of virus through the air. Other studies have found a similar results (Faridi et al. 2020; Kenarkoohi et al. 2020; Masoumbeigi et al. 2020; Karami et al. 2021a).

In this study, we selected 400 mL impinger that the bubbles produced burst at a certain height in the middle of the path, and the effluent air from the impinger could easily enter the pump without liquid suction into the pump. Therefore, the 400 mL glass impinger and suction pump (vacuum pump model: JAVAC EP) were selected.

Glutaraldehyde was used to disinfect medical equipment in bronchoscopic wards and sodium hypochlorite with a concentration of 2% was used to disinfect other surfaces. In this study, we attempted to perform air sampling after routine surface disinfection. This was done for minimizing secondary contaminitants. Previous studies have shown that this virus can be found at the surfaces of hospital environment. Therefore, in order to prevent secondary contamination in the sampling process, sampling was usually done after disinfection of surfaces. Despite the negative results in terms of the presence of corona in the air of the corona ward, which has been shown by the studies of Masoumbeigi et al. (2020), Faridi et al. (2020), Vosoughi et al. (2021), and other researchers (Rahmani Samani et al. 2021), however, it is better to follow health protocols as prevention tools. The World Health Organization emphasizes the importance of wearing a mask and also use of all personal protective equipment. In addition to advising staff on these issues, the World Health Organization recommends providing personal protective equipment and other facilities and supplies needed by staff. Finally, the organization emphasizes the importance of hand hygiene, sneezing and coughing rituals, environmental cleaning and disinfection, and maintaining physical distance and avoiding close and unprotected contact with people with fever or respiratory symptoms (Zandian et al. 2021; Organization 2020a, b; Sarailoo et al. 2021).

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