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Background

Airborne SARS-CoV-2 is considered to play a major role in covid-19 transmission, and has been found in several hospital environments, including corridors, patient rooms and cohort rooms. A number of factors have been found to increase the levels of airborne virus, such as low ventilation, patient viral load and in some cases, certain medical procedures. However, other specific medical situations still deserve further investigation.

Childbirth is one such interesting situation, as respiratory emissions are increased due to heavy breathing. In the case of an infected mother, these emissions could contain virus. Moreover, the patient's use of face masks is limited in these situations, due to the exertion of pushing during delivery. To date, published studies on SARS-CoV-2 during childbirth only include a small number of air samples collected with both passive and active air samplers. Most of these fail to detect airborne SARS-CoV-2 RNA.

The aim of the current study was to further explore the presence of airborne SARS-CoV-2 RNA during labor and delivery.

The Coriolis µ sampler, a liquid cyclone, was used to collect air samples. Air is sampled with 200 L min^{-1} and the collection liquid is analysed for virus.

Methods

Air was sampled before, during and after childbirth in rooms where the women giving birth had tested positive for covid-19. Sampling was performed using a liquid cyclone (Coriolis µ, Bertin Instruments, France), operating at 200 L min^{-1} for 10 min, with 15 mL of phosphate-buffered saline solution as collection liquid. The collection liquid was concentrated using Amicon Ultra-15 centrifugal filter units (50 kDa cutoff, Merck Millipore). SARS-CoV-2 RNA was detected from concentrated samples by real time reverse transcription polymerase chain reaction (RT-qPCR).

Results

- **44** air samples were collected on **six** occasions.
- **Six** samples, collected during **two** different childbirths, were positive for SARS-CoV-2 in RT-qPCR.
- The concentrations of RNA were generally **low**, with cycle threshold (Ct) values between 37.7 and 40.
- Positive air samples were found both **before, during and after delivery**.

Conclusion

There is a need to investigate the presence of airborne SARS-CoV-2 in other hospital areas than traditional infectious disease wards. The results from the present study can contribute to a better understanding of the risk of covid-19 transmission by aerosols at delivery wards. This can improve guidelines for protective equipment for healthcare personnel working with such patients.

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