

Monitoring SARS-CoV-2 aerosol transmission in hospitals

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Abstract

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) aerosols consist of small droplets exhaled from infected individuals and can remain in the air for long periods. It has been accepted that the spread of coronavirus disease 2019 (COVID-19) appears to occur through airborne transmission. Experimental production of aerosols has demonstrated that SARS-CoV-2 remains infectious in aerosols for hours [1,2]. Viral genetic material has been demonstrated in aerosols collected from hospitals [3,4,5] and recently it was demonstrated viral infectivity in aerosols collected from a hospital [6]. We optimized the methodology to capture by filtration a high diversity of airborne viruses and adapted this technology to the identification of SARS-CoV-2-containing aerosols by RT-qPCR and droplet digital PCR. We have monitored SARS-CoV-2 aerosols in different areas of two major hospitals in Madrid, Spain. La Paz University Hospital was monitored during the first COVID-19 pandemic wave, and Severo Ochoa University Hospital was monitored after the first pandemic wave and during the second wave. Air samples were taken from different locations of the hospitals: hot areas (Emergencies, Triage, Intensive Care Units), areas where transmission may occur (entrance, waiting rooms, health personnel rooms) and outside the hospital building. This technology allowed us to detect SARS-CoV-2 genomes in air samples from the hospitals during the COVID-19 pandemic. The presence of SARS-CoV-2 aerosols in different areas of the hospitals over several months will be presented.

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