Initial Assessment of SARS-CoV-2 Omicron Variant in Exhaled Breath Aerosol

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From December 16 through 21 of 2021, we collected exhaled breath aerosol (EBA) from five members of a University campus community infected with SARS-CoV-2 viruses displaying an S-gene target failure when assayed using the TaqPath COVID-19 Real Time PCR Assay (Thermo Scientific). The day-post-onset of symptoms when cases were tested ranged from one to four; One case gave samples on days 1 and 2, one on day 2, two on day 3, and one on day 4. All cases were mildly symptomatic. Exhaled breath aerosol was collected for 30 minutes with a Gesundheit-II using our previously described loud speaking and singing protocol (<https://doi.org/10.1093/cid/ciab797>). We detected viral RNA in aerosols from 4 of the 5 participants. Shedding detected in coarse and fine aerosols ranged from a trace to 3×10^2 and from 2×10^2 to 2×10^3 RNA copies/30-minute sample, respectively. All participants had received two doses of the BNT162b2 mRNA with the second dose > 2 weeks prior to infection. This small convenience sample suggests that vaccinated cases infected with the Omicron SARS-CoV-2 variant of concern can shed viral aerosols with similar intensity to cases we studied earlier in the pandemic. We did not see evidence of greater rates of aerosol shedding suggesting that a convergence of immune evasion with relaxed non-pharmaceutical interventions (e.g., increased unmasked social gatherings) rather than high intensity shedding may be responsible for Omicron's high transmission rates. Additional data will be required to confirm these findings, assess shedding from unvaccinated populations, and examine the impact of tight-fitting masks on shedding of the Omicron variant.