

US study shows decline in viral load of patients with COVID-19 as pandemic progressed

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A US study from the city of Detroit, presented at this week's ESCMID Conference on Coronavirus Disease (ECCMID, online 23-25

September) shows that the initial SARS-CoV-2 viral load in nasopharyngeal samples has been decreasing as the pandemic progressed. The authors also observed that the decline in viral load was associated with a decrease in death rate. The study is by Dr. Said El Zein, Wayne State University/ Detroit Medical Center, Detroit, MI, U.S., and colleagues.

The dynamics of the SARS-CoV-2 viral load (VL) on a population level remain poorly characterised. In this study, the authors present data describing the [downward trend](#) in the initial SARS-CoV-2 VL in nasopharyngeal swab samples of hospitalised patients in Detroit, Michigan during the period of April 4- June 5, 2020.

They conducted a retrospective study that included all hospitalised patients who had initial nasopharyngeal swab samples analysed at the Detroit Medical Center, that returned positive for SARS-CoV-2 by PCR testing between April 4 and June 5, 2020. To estimate the viral load, the authors used the so-called cycle threshold (Ct) value provided by the test for each [sample](#)—a higher Ct indicates a lower viral load. Based on their studies, the authors designated high, intermediate, and low VL samples to have a Ct value of 25 or under, 26-36, and 37 or over, respectively.

During the first week of the study (week of April 4, 2020), 49% of the initial VL samples were in the intermediate group, compared to 25.5% each in the low and high VL categories respectively. Thereafter, there was a progressive decline in the percentage of samples in the high and intermediate VL categories with a concomitant rise in the percentage of samples in the low VL category.

By week five of the study, 70% of the positive samples had an initial low VL. This trend in initial VL coincided with a decrease in the percent of deaths (see figure 1 in abstract). Almost half of the patients in the high VL group died (45%) compared to 32% and 14 % of the intermediate

and low VL categories respectively (Figure 2).

The authors conclude: : "During the April-June 2020 period of the COVID-19 pandemic, the initial SARS-CoV-2 load steadily declined among hospitalised patients with a corresponding decrease in the percent of deaths over time. Though confounding variables have not been evaluated, this suggests an association between initial viral load and mortality."

Dr. El Zein adds: "Exact reasons for a decrease in initial viral load over time are unclear. A downward trend in the initial VL may reflect a reduction in the severity of the pandemic and trends in the [viral load](#) values over time may represent a marker to assess the progress of the pandemic. Rapid implementation of social distancing measures, lockdown and widespread use of facemasks may have contributed to a decrease in the exposure to the virus."

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