# COVID-19 Evidence Digest 11/17/20

## Persistence and Evolution of SARS-CoV-2 in an Immunocompromised Host (NEJM)

**Bottom Line:** As occurs with other respiratory viral infections, immunosuppressed patients infected with SARS-CoV-2 may have difficulty clearing the virus, resulting in episodes of recurrence and viral evolution.

**Details:** This case report describes the clinical course of a 45-year-old immunosuppressed man hospitalized with fever and diagnosed with COVID-19. He had severe antiphospholipid syndrome (an autoimmune disorder) and diffuse alveolar hemorrhage (bleeding in the lungs), and was receiving anticoagulation therapy, glucocorticoids, cyclophosphamide, and intermittent rituximab and eculizumab (drugs to reduce inflammation, suppress the immune system, and treat autoimmune diseases). He received remdesivir for 5 days and an increased dose of glucocorticoid due to suspected diffuse alveolar hemorrhage. He was discharged on day 5 and quarantined from days 6 to 68. During this time he experienced abdominal pain, fatigue, and shortness of breath, and was hospitalized three times. This was complicated by hypoxemia (low level of blood oxygen) and was treated with additional glucocorticoids. On day 39, his SARS-CoV-2 reverse transcription polymerase chain reaction (RT-PCR) cycle threshold (Ct) value was 37.8 which suggests resolving infection. However, on day 72 a Ct of 27.6 caused concern for COVID-19 recurrence and he received remdesivir for 10 days and later COVID-19 tests were negative. On day 105, he was admitted for cellulitis (bacterial skin infection) and developed hypoxemia on day 111, requiring high-flow oxygen. His immunosuppression was increased due to concern of recurrent diffuse alveolar hemorrhage. On day 128, his Ct value was 32.7, causing concern again for a COVID-19 recurrence and was given remdesivir for 5 days. He was treated with intravenous immunoglobulin, intravenous cyclophosphamide, daily ruxolitinib (for its anti-inflammatory effects), and glucocorticoids given his decrease in respiratory function. On day 143, his Ct value was 15.6, which caused concern for a third recurrence of COVID-19. The patient received a SARS-CoV-2 antibody cocktail against the SARS-CoV-2 spike protein (REGN-COV2). On day 150, he was intubated due to hypoxemia. On day 151 his Ct value was 15.8 and he had *Aspergillus fumigatus* (a type of fungus). The patient received remdesivir and antifungal agents, but on day 154, he died from shock and respiratory failure. Additional analysis of respiratory samples revealed increased changes in the SARS-CoV-2 genome that is associated with someone who is immunosuppressed.

**Key Takeaways:**

- Although most immunosuppressed people recover from COVID-19, this case report details 3 recurrences of SARS-CoV-2, with observed changes in the viral genome.

## Safety and Efficacy of Inhaled Nebulised Interferon beta-1a (SNG001) for Treatment of SARS-CoV-2 Infection: A Randomised, Double-Blind, Placebo-Controlled, Phase 2 Trial (Lancet Resp Med)

**Bottom Line:** Treatment with an antiviral treatment that patients breathe in (inhaled nebulized interferon beta-1a) may have a role in reducing time to clinical improvement for hospitalized COVID-19 patients.

**Details**: In a randomized, double-blind (neither patients nor study team knew which arm of the study patients would be placed into) controlled pilot trial in the UK, 101 adults admitted

with polymerase chain reaction (PCR)-confirmed symptomatic COVID-19 were randomly assigned to inhaled nebulized interferon beta-1a (an antiviral drug that treats and prevents lower respiratory tract diseases caused by respiratory viruses) or placebo to inhale by a mouthpiece once daily for up to 14 days. The two groups were evaluated to see if the treatment led to an improvement in clinical condition using a standardized 9-point ordinal scale (ranging from 0-9, with 0 indicating no infection and 8 indicating death). Patients who received the inhaled nebulized interferon beta-1a were 2.32 times more likely to have clinical improvement on the ordinal scale on day 15-16 and were 2.19 times more likely to improve to the degree that they had no limitation of activities during the treatment period. No safety concerns arose during the pilot trial although more patients receiving the study drug reported headache compared to those receiving placebo (15% vs. 10%).

**Key Takeaways:** Inhaled nebulized interferon beta-1a was shown to be a well-tolerated, safe treatment for patients hospitalized with COVID-19. Patients receiving this drug were more likely to have clinical improvement as well as a faster time to clinical improvement despite having more severe disease at baseline.

**Risk Assessment and Management of COVID-19 among Travelers Arriving at Designated U.S. Airports, January 17- September 13, 2020 (MMWR)**

**Bottom Line:** CDC's resource-intensive temperature and symptom-based screening program for air passengers arriving to the U.S. from certain countries resulted in the identification of 1 case per 85,000 travelers screened, necessitating a strategy and communication shift to address importation of SARS-CoV-2 cases.

**Details:** In January of 2020, CDC and the Department of Homeland Security instituted a symptom-based screening program at select U.S. airports for travelers coming to the U.S. from certain countries with widespread community transmission of SARS-CoV-2 to reduce the importation of cases. The temperature and screening program sought to identify and separate travelers with COVID-like illness and those with a known COVID-19 exposure, provide education about preventing transmission, and obtain contact information to share with public health authorities in destination states. From 1/17 to 9/13, 766,044 passengers were screened, of whom 0.04% (n=298) met criteria for further assessment. 0.005% (n=35) were tested for SARS-CoV-2 using reverse transcription polymerase chain reaction (RT-PCR), and 0.001% (n=9) tested positive, representing 1 in 85,000 of all travelers screened. CDC shared contact information with states for 68% of screened passengers; providing complete and accurate information proved challenging due to data collection issues and state variation regarding ability to receive data due to competing response priorities. The low number of cases identified through this resource intensive approach, coupled with the fact that symptom-based screening programs do not catch those without symptoms or those with non-specific symptoms, both of which are fairly common with SARS-CoV-2, necessitated a shift in strategy, and on 9/14, the screening program was discontinued. Since then, strategies to reduce the importation of SARS-CoV-2 cases include: enhanced response capacity at ports of entry, referral mechanisms to CDC for symptomatic travelers, and more extensive communication with air passengers regarding recommending preventive measures. Other specific recommendations to improve this strategy are offered.

# COVID-19 Evidence Digest 11/17/20

**Key Takeaways:**

- CDC's strategy to address importation of COVID-19 cases at designated U.S. airports shifted from temperature and symptom-based screening, which is ineffective due to non-specific symptoms of and asymptomatic COVID-19, to strengthening response capacity at entry ports, referral mechanisms to CDC for symptomatic travelers, and communication with travelers regarding preventive measures.
- Additional recommendations include: better collection of international traveler contact information before arrival to the U.S. to health departments for jurisdictional management, including contact tracing; traveler health attestations; pre-departure and post-arrival SARS-CoV-2 testing; and policies to restrict movement after higher-risk travel.