COVID-19 Evidence Digest 10/16/20

Reinfection of SARS-CoV-2 in an Immunocompromised Patient: A Case Report (CID)*

Bottom Line: Reinfection with SARS-CoV-2 appears to be possible, and in the case of this immunocompromised patient, reinfection occurred soon after the first infection, resulting in death.

Details: An 89-year-old woman with the blood cancer Waldenstrom's Macroglobulinemia who was receiving treatment to deplete her B-cells (the cells that fight infections by producing antibodies) became infected with SARS-CoV-2 twice within 60 days. The first infection was mild to moderate and her symptoms improved completely. The second infection, which began 2 days after she received a new chemotherapy treatment, was severe; she died 2 weeks later. Based on the genetic data from her polymerase chain reaction (PCR) nose swabs, it appears that this woman had 2 separate COVID-19 infections, rather than re-activating the first infection. Notably, she did not have detectable SARS-CoV-2 antibodies at the start of her 2nd infection.

Key takeaways:

- As documented in earlier cases, reinfection with SARS-CoV-2 is possible, though likely rare.
- Repeat infection with SARS-CoV-2 can sometimes be more severe than the initial infection.

Longitudinal Profile of Laboratory Parameters and Their Application in the Prediction for Fatal Outcome among Patients Infected with SARS-CoV-2: A Retrospective Cohort Study (CID)

Bottom Line: In this study, abnormal blood levels of specific kinds of proteins and enzymes, a substance produced in response to tissue injury, and immune system white blood cells were predictors of death due to COVID-19.

Details: This retrospective study, conducted with 642 COVID-19 patients from Wuhan, China, sought to understand the variables that predicted death due to COVID-19. Data on 55 biomarkers and cytokines (types of protein made by certain immune and non-immune cells) were collected on all patients throughout the course of disease. Based on the available data, three clinical stages were determined: the acute stage (days 1–9), critical stage (days 10–15) and convalescence, or recovery, stage (day 15 to observation end). Of the 642 patients, 75 died and 357 were discharged. Median age was 63.5 years (IQR, 52–70 years), 50.5% of patients were female, and 55.0% had underlying conditions. At the acute stage, older age and abnormal levels of lactate dehydrogenase (LDH, a group of enzymes found in the blood and other body tissues involved in cellular energy production), urea (a nitrogen-containing substance typically cleared from the blood by the kidney), lymphocyte (type of white blood cells, such as B and T cells, that are part of the immune system) count, and procalcitonin (PCT, a substance produced by many cells in response to tissue injury or bacterial infections) level predicted death. At the critical stage, age and abnormal PCT, LDH, cholinesterase

*Denotes a study that has received some media attention

(an enzyme required for nervous system functioning), lymphocyte count, and monocyte (type of immune cell made in the bone marrow that travels through the blood to tissues in the body to kill microorganisms and boost immune responses during inflammation) percentage predicted death. Interleukin 6 (IL-6, a protein produced by various cells that helps regulate immune responses) was also highly elevated among fatal cases compare to discharged patients. Respiratory, viral load, and blood coagulation markers data were not included in this study.

Key Takeaways:

- Older age and specific biomarkers and proteins are important factors that can be used to predict higher likelihood of death due to COVID-19.
- Identifying these factors that are routinely tested for may allow for early identification of patients who are at a higher risk of death due to COVID-19 and aggressive treatment of those patients.

Outcomes of Neonates Born to Mothers with Severe Acute Respiratory Syndrome Coronavirus 2 Infection at a Large Medical Center in New York City (JAMA Pediatrics)

Bottom Line: In this study of SARS-CoV-2 transmission from mothers with suspected or confirmed infection to their newborn infants, 99/101 (98%) had negative test results; two had results suggesting low viral load. None had any evidence of COVID-19 disease despite direct breastfeeding and co-rooming in the hospital for most infants.

Details: In this study, medical records were reviewed for 101 infants born to 100 mothers with PCR-confirmed or suspected SARS-CoV-2 at a large academic medical center in New York City in March and April. Following delivery, newborns were placed in well-baby nurseries (WBNs; n=82) and 19 were admitted to neonatal intensive care units (NICUs). The majority of mothers with infants in the WBNs roomed with them (n=76); mothers were required to wear masks, and breastfeeding after appropriate hand and breast washing and delayed bathing were encouraged. Mothers' SARS-CoV-2 status was classified as asymptomatic or mildly symptomatic (n=90) versus severe or critical (n=10). Of 141 tests administered to 101 newborns, 2 had results suggestive of low viral load; 1 infant did not get retested but did not display any COVID-19 symptoms at follow up, and the other was negative upon retesting. Mothers having severe or critical COVID-19 was associated with births 1 week earlier and increased risk of their infants needing phototherapy, or treatment with a special kind of light, as compared with mothers with asymptomatic or mild COVID-19. At 4 and 11 days post-birth, 55/55 newborns remained well at a follow-up clinic. 20/55 newborns and 3 newborns followed up in other settings had over 30 non-routine encounters at days 4 and 26, but none had evidence of SARS-CoV-2 infection.

Key Takeaways:

- Though these data are limited, findings suggest that vertical transmission of SARS-CoV-2 from mothers to newborns is rare.

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- Given these findings, direct breastfeeding appears to be safe, and policies that separate women with confirmed or suspected SARS-CoV-2 from their newborn infants may not be needed.

Factors Influencing Risk for COVID-19 Exposure Among Young Adults Aged 18–23 Years — Winnebago County, Wisconsin, March–July 2020 (MMWR)

Bottom Line: In this analysis of factors that influence risk of COVID-19 exposure among 18-23 year-olds in one Wisconsin County, peer pressure, exposure to misinformation, perceived low severity of COVID-19, perceived responsibility to others, and lack of beliefs in wearing masks were identified as drivers of behavior.

Details: Following the rescinding of Wisconsin's stay at home emergency order in mid-May, SARS-CoV-2 cases began to increase, particularly among young adults. This study employed quantitative and qualitative methods to identify factors that influence exposure risks to COVID-19 among young adults in Winnebago County, WI. Quantitative measures captured included age, occupation, and attendance at social gatherings among 18-23 year-olds with a positive SARS-CoV-2 test result from March to July (n=240). Key informant interviews were conducted with 13 young adults, nine business owners with businesses catering to young adults, and eight community leaders within the County. Of the 240 positive cases, 54% were female, and 72% were employed. Of those who were employed, over 80% reported working outside the home, 38% reported attending a social gathering, and 84% reported COVID-like symptoms during the exposure period. Interview participants described various individual and social factors that may drive behaviors that increase one's risk for acquiring SARS-CoV-2. Common themes raised by young adult interviewees included concerns about workplace exposures among those with public-facing roles, exposure to misinformation and conflicting messages about COVID-19 and the need for and effectiveness of masks, perceived or actual peer pressure not to wear masks in certain settings (e.g., around friends) despite overall positive attitudes toward masks, and low perceived severity of COVID-19 disease for themselves; by contrast, interviewees expressed a sense of responsibility for loved ones at greater risk for severe COVID-19 disease, and the broader community. Similar themes were reported among business owners and community leaders; business owners also often reported discontinuing mask requirements so as not to offend customers and to compete with other businesses in the absence of a mask ordinance.

Key Takeaways:

- Messaging around COVID-19 prevention and risk reduction among young adults should address factors that influence risk; potential strategies include highlighting their responsibility to protect others and addressing perceived or actual peer pressure to not follow public health guidance.
- There continues to be a need for clear and consistent messaging on the importance and effectiveness of face coverings to address misinformation and conflicting messages.

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