COVID-19 Research Watch
December 14, 2020

CLINICAL PRESENTATION & MANAGEMENT

COVID-19 infection among people with HIV in New York City: A population-level analysis of linked surveillance data

The authors presented a population-level descriptive analysis of linked data from the NYC HIV surveillance and COVID-19 surveillance systems to compare the characteristics and COVID-19-related outcomes of people with HIV (PWH) diagnosed with COVID-19 in New York. Death data and lab-confirmed COVID-19 cases reported to the NYC Health Department were matched with the NYC HIV surveillance registry. As of June 2, 2020, 204,583 COVID-19 cases were reported, of which 2,410 had HIV and were eligible for the study. A greater percentage of COVID-positive PWH compared to all NYC PWH and all NYC COVID-positive individuals were 45 and older (76.8% vs. 68.1% & 60.3%), Black or Latino/Hispanic (86.2 vs. 78.4% & 33.1%), and 30%+ below the federal poverty line (31.6% vs. 25.1% & 16.1%). Additionally, COVID-19 PWH in NYC were more likely to be hospitalized, admitted to the ICU and/or die. Poor outcomes from COVID-19 in PWH were associated with CD4 <500 cells/μL. This data should inform the public health response to COVID-19 and highlight the need for additional support and services for people living with HIV.

SCREENING & TESTING

Identification of pre-symptomatic and asymptomatic cases using cohort-based testing approaches at a large correctional facility – Chicago, Illinois, USA, May 2020

The authors conducted an epidemiological investigation at Cook County Jail, Chicago, Illinois to evaluate the utility of serial testing as a method of identifying asymptomatic and pre-symptomatic cases. Housing units were selected for inclusion if at least one individual tested positive for SARS-CoV-2 and was placed on quarantine. During May 1-19, 2020, two cohort-based SARS-CoV-2 testing strategies were employed: 1) individuals were asked to participate in serial testing (day 1, day 3-5, and day 13-14), and 2) offered a single test and interview to assess current symptoms at the end of the 14-day quarantine. 195 of the 224 individuals approached agreed to participate in at least one component of the investigation. A majority of participants identified as non-Hispanic Black (67%), Hispanic (19%), and non-Hispanic White (6%). Of the 172 tested individuals, 19 tested positive for SARS-CoV-2. In the serial testing group, 17 new cases (89% of confirmed total) were detected: 16 on day 1, one on days 3-5, and none on days 13-14. In the second group, two new cases (11% of confirmed total) were identified. Of the newly identified cases, 63% were asymptomatic. The authors conclude that symptom screening alone is ineffective in identifying new cases and this study supports the utility of early cohort-based testing approaches in detention centers to effectively identify pre-symptomatic and asymptomatic cases.

Real-life validation of the Panbio™ COVID-19 antigen rapid test (Abbott) in community-dwelling subjects with symptoms of potential SARS-CoV-2 infection

In this comparative report, authors investigated the diagnostic value of the Panbio™ COVID-19 antigen rapid test against RT-qPCR. A total of 1367 participants from Utrecht, Netherlands (medium-endemic area) and 208 participants from Aruba (high-endemic area) provided nasopharyngeal swab
specimens that underwent parallel RT-qPCR and rapid antigen testing. Results showed that the rapid antigen test had a demonstrated specificity of 100% (95% CI: 99.7-100%) and a demonstrated sensitivity of 72.6% (95% CI: 64.5-79.9%) in the Netherlands; in Aruba, specificity and sensitivity were 100% (95% CI: 97.5-100%) and 81% (95% CI: 69.0-89.8%), respectively. When cycle threshold values were restricted to <32 cycles, sensitivity surpassed 95% at both sites. While authors support the use of RT-qPCR tests in clinical settings, they suggest that the user-friendliness, short turnaround time, and low cost of the rapid antigen test make it a viable alternative to RT-qPCR for conducting community-based surveillance.

**NON-CLINICAL TRENDS**

**Increase in hospital-acquired carbapenem-resistant acinetobacter baumannii infection and colonization in an acute care hospital during a surge in COVID-19 admissions - New Jersey, February-July 2020**

The authors of this study assessed the relationship between the increase in COVID-19 patient intake and the infection rate of carbapenem-resistant *Acinetobacter baumannii* (CRAB) at a hospital in urban New Jersey. CRAB is a type of multidrug-resistant organism (MDRO) that is difficult to control due to rapid spread within healthcare settings. From March to August 2020, about 850 patients were admitted to this hospital with COVID-19. From February to July, the hospital saw 34 new cases of CRAB, a large jump from the average of zero to two cases per month before the pandemic. Of these new cases, 17 were positive for COVID-19 and 25 were being monitored in the intensive care unit (ICU). The hospital identified a number of issues that could have contributed to this uptick: ventilator circuits and catheters were not changed as frequently as before in an attempt to save equipment, personal protective equipment (PPE) was used for longer periods of time before disposal, and surfaces were not cleaned as often due to lack of staff and supplies. Upon making changes to cleaning schedules, the hospital saw fewer CRAB cases in June and no cases in August. These findings highlight the importance of upkeeping protective measures related to prevention of infection with CRAB and similar MDROs even when hospital resources are strained.

**Race/ethnicity among children with COVID-19-associated multisystem inflammatory syndrome**

Lee et al. conducted a cohort study to look at the association between race and ethnicity, multisystem inflammatory syndrome (MIS-C), and COVID-19 hospitalization rates using data collected from public health records of all MIS-C cases in people under 21 years old and all COVID-19 confirmed cases in people under 20 years old, between March 1 and June 30, 2020. Black and Hispanic children accounted for higher proportions of MIS-C cases and COVID-19 hospitalizations compared to White and Asian children. The authors found that the overall incidence of MIS-C in people under 20 years old was 11.4 per 100,000. When stratified by race and ethnicity, there was a higher incidence rate ratio of MIS-C among Black and Hispanic children, 3.2 and 1.7 respectively, compared to White children. The author suggests further studies into the association between race and ethnicity and MIS-C cases.

**Distance from the outbreak of infection, ozone pollution and public health consequences of SARS-CoV-2 epidemic**

Using a breakpoint analysis, Tripepi et al. aimed to identify the relationship between geographical proximity to Lodi (the city of the original COVID-19 outbreak in Italy) and COVID-19 cases and mortality. Primarily, findings indicated that the SARS-CoV-2 case burden increased when distance from Lodi, reduced below 92 km (95% CI: 81-119 km). Excess mortality was also higher at distances below 140 km (95% CI 131-182 km). Additionally, ozone (O₃) pollution was found to modify the
relationship between distance from Lodi and cases of SARS-CoV-2 as well as excess all-cause mortality (p<0.0005). Specifically, a reduction in distance from Lodi of 50 km led to an additional 0.15 to 0.29 COVID-19 cases per 10,000 inhabitants depending on the level of O₃ pollution (p=0.0001). The same reduction in distance was also associated with an 12.7% to 81.3% increase in excess mortality rates. Authors suggest that similar analytical strategies may be employed to inform and shape public health responses to future epidemics.

PHARMACEUTICAL INTERVENTIONS

Repurposed Antiviral Drugs for Covid-19 — Interim WHO Solidarity Trial Results

Researchers assigned 11,335 hospitalized patients from 405 hospitals in 30 different countries to a drug regimen - one of remdesivir, hydroxychloroquine, lopinavir, interferon, or no regimen - to see if they impacted disease progression as measured by mortality, ventilation, and hospital duration. The results showed there were 1253 deaths: 301/2743 remdesivir patients versus 303/2708 in the control, 104/947 hydroxychloroquine patients versus 84/906 in the control, 148/1399 lopinavir patients versus 146/1372 in the control, 243/2050 interferon patients versus 216/2050 in the control. The risk of the primary outcome, in-hospital mortality, in this study was found to be primarily impacted by age, with a Kaplan-Meier risk of 20.4% in patients 70 years or older and 6.2% in those 50 years or younger, and ventilation, with a Kaplan-Meier risk of 39.0% if patients were on versus 9.5% without. Regarding the secondary outcomes of ventilation and time to discharge no significant finding was found. Therefore, the authors suggest that the trial drugs had minimal to no effect on the hospitalized patients with COVID-19.

Clinical outcomes of a COVID-19 vaccine: implementation over efficacy

Paltiel et al. used a mathematical model to evaluate the extent to which implementation parameters and vaccine efficacy will play a role in the success of COVID-19 vaccination. The authors found that vaccines with demonstrated efficacy coupled with little consideration for implementation would yield minimal public health benefit. They illustrated this conclusion through varying combinations of vaccine efficacy, pace (speed of manufacturing/distribution) and coverage (extent of vaccine delivery). For example, a vaccine that attained 90% coverage, with a pace of 0.1% averted 6% of infections, compared with a vaccine that attained 50% coverage, with a pace of 0.5% which averted 35% of infections. As multiple COVID-19 vaccines are developed and distributed in the coming months, the findings of this modelling study emphasize the need to consider effective implementation strategies, including attention to public confidence in COVID-19 vaccines in addition to vaccine efficacy.

Metformin and risk of mortality in patients hospitalised with COVID-19: a retrospective cohort analysis

Bramante et al. conducted a retrospective cohort analysis to assess the relationship between the use of metformin and COVID-19 related hospital mortality among adults ages 18 years or older. A total of 15,380 individuals were recruited and based on the inclusion criteria, 6,256 individuals were eligible for the study. Inclusion criteria included but was not limited to having type 2 diabetes or obesity and hospital admission with a PCR-confirmed COVID-19 diagnosis. A total 394 (16.9%) individuals out of the 2,333 with metformin use died due to COVID-19 while hospitalized, compared to 791 (20.2%) of the 3,923 individuals with no metformin use. Metformin was associated with decreased mortality.
among women (hazard ratio 0.785, 95% CI 0.65, 0.95; odds ratio 0.759, 95% CI 0.601, 0.960). Metformin showed no significant mortality reduction among men. Given the accessibility, history of use, and availability of metformin, more research is needed to better assess the benefits of its use and treatment for COVID-19-impacted obese and diabetic individuals.

**Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK**

Voysey et al. investigated the safety and efficacy of the ChAdOx1 nCoV-19 vaccine utilizing data from randomized controlled trials in the UK, Brazil and South Africa conducted between April and November 2020. Participants were primarily between the ages of 18-55 with most at high risk of exposure to the virus, i.e. healthcare workers. Of the 11,636 participants included in the analysis, vaccine efficacy was 62.1%, in participants who received two standard doses, and 90.0% in those who received a low dose and a subsequent standard dose. Across both groups, the overall vaccine efficacy was 70.4%. Ten participants, all of whom were in the control arm, were hospitalized due to COVID-19 within 21 days of their first vaccine dose. In the months of safety follow-up, 175 severe adverse events occurred in 168 participants, with 84 of these events among the ChAdOx1 nCoV-19 group and 91 in the control group. Three of the total events were classified as potentially related to a vaccine, either ChAdOx1 nCoV-19 or the control. The authors suggest that the results from the interim analysis demonstrate that the ChAdOx1 nCoV-19 vaccine is safe and efficacious against symptomatic COVID-19.

**NON-PHARMACEUTICAL/PUBLIC HEALTH INTERVENTIONS**

**Implementing Mitigation Strategies in Early Care and Education Settings for Prevention of SARS-CoV-2 Transmission—Eight States, September—October 2020**

Coronado et al. conducted a mixed-methods study in collaboration with the ACF and the CDC in Head Start programs throughout eight states (Alaska, Georgia, Idaho, Maine, Missouri, Texas, Washington, and Wisconsin) in the United States. The objective of the national Head Start program is to promote healthy development and learning for pregnant women and children aged 0-5 years old from families that meet the Federal Poverty Guidelines. Using federal COVID-19 funds (CARES Act), the Office of Head Start supported local programs in their re-opening of in-person services during the COVID-19 pandemic. In-depth interviews with program directors revealed common themes such as flexible medical leave and enhanced benefits in response to the pandemic for staff, as well as ongoing communication about standard operating procedures between staff and parents and caregivers. Barriers to implementation of mitigation strategies included, among others, maintaining adequate ventilation, adhering to social distance guidelines, and mental health concerns. Facilitators for implementation included collaboration and continuous engagement with health departments, community organizations, and community members. Overall, gaining a better understanding of the impact mitigation strategies can bring into childcare programs will support the reduction of SARS-CoV-2 transmission while allowing communities to benefit from in-person child care and education programs.
ADDITIONAL RESOURCES
UCSF Library COVID-19 Research and Information Resources
UCSF Institute for Global Health Sciences COVID-19 Resources
UC Davis One Health Institute COVID-19 FAQs
Harvard Viswanath Lab Myths vs Facts

Note on this Document: This document was assembled by graduate and doctoral students attending the University of California, San Francisco with the intent of facilitating the rapid dissemination of information to the global community in order to help during this time. Diana Etwaru, Caihla Petiprin, Micaela Reyna, Hannah Thomas, Lina Salam, and Shivali Joshi contributed to these summaries. This work is volunteer based.

References: