COVID-19 Research Watch
December 21, 2020

CLINICAL PRESENTATION & MANAGEMENT

**Analyses of Risk, Racial Disparity, and Outcomes Among US Patients with Cancer and COVID-19 Infection**¹

This retrospective case-control study examined 73.4 million patients’ medical records across 360 hospitals and 317,000 clinicians to investigate risk of COVID-19 among those with specific cancers and whether there are cancer-specific racial disparities for COVID-19 infection. Wang et al. found that among 2,523,920 patients identified with at least one of the 13 common cancers, 273,140 had been diagnosed within the year. Among the 16,570 patients diagnosed with COVID-19, 1200 had a cancer diagnosis and 690 had a recent cancer diagnosis of at least 1 of the 13 common cancers. Those with recent cancer diagnosis were at significantly increased risk of COVID-19 infection (adjusted OR = 7.14), with the strongest association for recently diagnosed leukemia (adjusted OR = 12.16). Among patients with recent cancer diagnosis, African Americans had a significantly higher risk for COVID-19 infection than White patients. This racial disparity was largest for breast cancer (adjusted OR = 5.44). Patients with cancer and COVID-19 had significantly worse outcomes (47.46% hospitalized and 14.93% died) than patients with COVID-19 and without cancer (24.26% hospitalized and 5.26% died) or patients with cancer and without COVID-19 (12.39% hospitalized and 4.03% died). These results highlight the need to protect and monitor patients with cancer as a component of the pandemic control strategy.

**Readmission and Death After Initial Hospital Discharge Among Patients With COVID-19 in a Large Multihospital System**²

This retrospective case control study measured the rate of readmission, reasons for readmission, and rate of death for patients after hospital discharge among patients with COVID-19 in the Veterans Affairs (VA) health care system. 2179 patient records for veterans presenting with definite or probable COVID-19 hospitalizations from 132 VA hospitals were identified and compared to patients hospitalized for non-COVID pneumonia and heart failure during the same time period. Of the 2179 index hospitalizations for COVID-19, 678 patients (31.1%) were treated in an ICU, 279 (12.8%) were mechanically ventilated, 307 (14.1%) received vasopressors, and 1775 (81.5%) survived to discharge. A total of 354 patients (19.9%) who survived COVID-19 hospitalization were readmitted within 60 days of discharge, while 162 (9.1%) died during this period, and 479 (27.0%) were readmitted or died. Among those readmitted, COVID-19 (30.2%), sepsis (8.5%), pneumonia (3.1%), and heart failure (3.1%) were the most common readmission diagnoses. During readmission, 22.6% were treated in intensive care, 7.1% were mechanically ventilated, and 7.9% received vasopressors. Overall, the authors found that 27% of those surviving hospitalization for COVID-19 were readmitted or died by 60 days after discharge, a rate that was lower than the matched survivors of pneumonia or heart failure.
NON-CLINICAL TRENDS

Male sex identified by global COVID-19 meta-analysis as a risk factor for death and ITU admission

For this meta-analysis of 3,111,714 global COVID-19 cases, Peckham et al. collected data from forty-six countries and forty-four US states. The authors found that despite an even proportion of men and women with confirmed COVID-19, male patients had 2.84 times the odds of requiring intensive treatment unit admission and 1.39 times the odds of death than female patients. The authors note a number of possible explanations for this female advantage: sex differences in the innate and adaptive immune system and other biological factors, differences in comorbidities, and differences in socio-cultural norms and behavior (e.g. smoking). The authors posit that these findings will have implications for case management and mitigation strategies for COVID-19.

Impact of the COVID-19 pandemic on testing services for HIV, viral hepatitis and sexually transmitted infections in the WHO European Region, March to August 2020

In this study, 98 responses from secondary care facilities, community testing sites (run by community-based organizations and non-governmental organizations), and national-level public health institutions were assessed to ascertain the impact of COVID-19 on testing services for HIV, viral hepatitis, and sexually transmitted infections. Between March and May 2020, 95% of respondents reported decreases in testing with 64% of respondents reporting severe declines of over 50% in testing volume. From June to August of 2020, 58% of respondents still reported decreased testing with 20% reporting severe testing provision disruption. To reduce the decline in testing, new testing resources were offered to patients such as remote appointments, stricter criteria for testing, appointment-based testing and referral to other sites if needed. Although organizations and institutions have adapted to this change, they reported being in need of additional guidance and support in terms of human and financial resources. Authors highlight the importance of maintaining the response to other infectious diseases throughout the COVID-19 pandemic and they recommend investing in integrated testing responses to restore testing provisions for HIV, viral hepatitis and STIs, especially for key populations.

Knowledge, attitudes and practices towards COVID-19 among Pakistani residents: information access and low literacy vulnerabilities

A web-based survey, an urban survey and a rural survey collected responses from 906 Pakistani adults (≥ 18 years) to assess their knowledge, attitudes and sanitary practices for COVID-19. In this study, the mean age was 33.5 years and 51% of respondents were female. Web-based and urban survey respondents had 2 to 7 times greater knowledge and were 4 to 5 times more likely to use COVID-19 sanitary practices compared to the rural survey group. While two thirds of respondents expressed high levels of fear about COVID-19, this was highest among rural survey respondents compared to the other surveys. With regard to attitude, 90% of respondents had an unfavourable attitude in terms
of COVID-19 transmission prevention strategies. The findings of this study indicate the need to educate different population groups about COVID-19 and COVID-19 prevention practices, in particular within the rural populations in Pakistan.

REGION-SPECIFIC LESSONS LEARNED

SARS-CoV-2 antibody seroprevalence in the general population and high-risk occupational groups across 18 cities in Iran: a population-based cross-sectional study

Poustchi et al. conducted a population-based cross-sectional study on SARS-CoV-2 antibody seroprevalence across eighteen cities in Iran during the first wave of the epidemic (data collection ended on June 2); a total of 8,902 participants were included in the analysis (60% from high-risk occupations and 40% from the general public). The authors found the overall prevalence of antibody seropositivity was 17.1% in the general population and 20.0% in the high-risk population (with little variation among the occupations included). They also found a large variation in the seroprevalence of SARS-CoV-2-specific antibodies across cities. Individuals sixty and older had the highest age-stratified seroprevalence. The authors conclude that seroprevalence of SARS-CoV-2 in Iran is likely much higher than the prevalence of COVID-19 based on confirmed cases. Additionally, a large proportion of the population remains uninfected and susceptible to the virus.

MODELING

Effect of internationally imported cases on internal spread of COVID-19: a mathematical modelling study

This study sought to understand the effect of international travel on the spread of COVID-19 within 162 countries. The authors used modelling to predict the proportion of cases that were imported from international travelers versus transmission within the country based on the average number of cases per day in each country in the months of May and September 2020. The authors then compared what would have happened had international travel stayed at 2019 levels for those months or been at 2020 travel levels. At 2019 travel volume levels, 102 of 136 countries would have experienced no more than 10% of their COVID-19 cases from international travel compared to 74 countries at 2020 travel volumes. For the month of September, less than 1% of cases would have been from international travel in 44 countries at 2020 travel volumes and half of these countries (n=22) had epidemic growth rates below exponential growth. The results of these models suggest that international travel will likely lead to the importation of COVID-19 cases, but strict travel restrictions may not be as beneficial in places where countries have high local incidence as international importation of cases will make up a small portion of the overall cases in a country.

PHARMACEUTICAL INTERVENTIONS
Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine

This study reports the results from the BioNTech Pfizer BNT162b2 RNA vaccine trial which enrolled 43,547 participants in a two dose, placebo-controlled double-blind study. Among those who received the active vaccine, 8 cases of COVID-19 were observed 7 days after the second dose was administered compared to 162 COVID-19 cases among the placebo group, which translates to the vaccine being 95% effective in preventing COVID-19. Severe COVID-19 was observed in 9 participants who received the placebo versus 1 participant in the active vaccine arm. Serious adverse events were similar between the active vaccine and placebo groups and side effects of the active vaccine included short-term pain at injection site, fatigue, and headache.

SCREENING AND TESTING

Rapid triage for COVID-19 using routine clinical data for patients attending hospital: development and prospective validation of an artificial intelligence screening test

In this prospective cohort study, researchers used electronic healthcare records (EHR) of 155,394 adults in Oxfordshire, UK, to develop a rapid triage system to screen hospital patients for COVID-19. Data used from EHRs included vital signs, blood gas testing and presentation blood tests. Screening results were compared to polymerase chain reaction (PCR) test results for SARS-CoV-2. Machine learning was used to develop both linear and non-linear models, and test sets were generated to simulate the progression of a pandemic by varying the prevalence of COVID-19 in the test samples. A model generated for screening all patients visiting the hospital achieved 77.4% sensitivity and 95.7% specificity (emergency department model), while a different model evaluating those actually admitted into the hospital achieved 77.4% sensitivity and 94.8% specificity (admissions model). In a 2-week validation study, the emergency department model achieved 92.3% accuracy and the admissions model demonstrated 92.5% accuracy. The authors stress that the clinical data used in the model can be obtained within one hour of arrival at the hospital via routine tests that are conducted within usual care to effectively triage patients while awaiting PCR test results which can take up to 72 hours to develop. The proposed triage tool using artificial intelligence can be easily implemented in hospitals in middle- and high-income countries.

TRANSMISSION PATTERNS

Evaluation of Rooming-in Practice for Neonates Born to Mothers With Severe Acute Respiratory Syndrome Coronavirus 2 Infection in Italy

This paper sought to evaluate transmission patterns between mothers with COVID-19 and their neonates. Sixty-two neonates born to 61 mothers with SARS-CoV-2 infection who were eligible for rooming-in practice were monitored across six maternity centers in Lombardy, Italy. Only one neonate was diagnosed with COVID-19 during the study period, in which
case the mother rapidly progressed from having mild symptoms to severe disease requiring mechanical ventilation on the fifth day after delivery. The study concluded that as long as mothers are experiencing mild COVID-19 symptoms or are asymptomatic and they are educated on droplet and contact precautions when holding and breastfeeding their infants, postnatal transmission of SARS-CoV-2 from mothers to neonates is rare.

NON-PHARMACEUTICAL INTERVENTIONS

**Feasibility of continuous fever monitoring using wearable devices**

Smarr et al. had launched TemPredict in March of 2020 to assess whether the onset of COVID-19 symptoms (i.e., fever) could be recognized using the Oura ring, a commercially available wearable device. This study looks at the findings from the first 50 subjects who had reported COVID-19 infections. The participants resided in the U.S., U.K., Finland, Australia, Germany, Honduras, Italy, The Netherlands, Norway, and Sweden. The researchers found a significant increase in maximum finger temperature during the symptom window compared to baseline. Furthermore, they also observed substantial inter-individual variance in both mean and range of finger skin temperature, emphasizing the fact that using a single temperature (i.e., 38C or 98.6F) is not appropriate. These findings counter previous concerns that distal body temperatures are too different from tympanic temperatures to be useful in detecting fevers and that it is feasible to use wearable temperature sensors to support research into other fever-associated illnesses. The authors suggest that COVID-19 could be identified from wearables, but this would require data from multiple physiological variables and additional research to develop best practices.

TRANSMISSION PATTERNS

**Household Transmission of SARS-CoV-2: A Systematic Review and Meta-analysis**

Madewell et al. explored the household secondary attack rate for SARS-CoV-2 through a meta-analysis of 54 studies including 77,758 participants. Their analysis found an overall household secondary attack rate of 16.6% although there was significant heterogeneity between studies. This secondary attack rate is higher than the previous secondary attack rates for SARS-CoV and MERS-CoV. Furthermore, the researchers found there to be significantly higher secondary attack rates from symptomatic index cases than asymptomatic or pre-symptomatic index cases. The findings of the study indicate that households are important venues for transmission and further exploration of prevention strategies, such as home mask-wearing, improved ventilation, voluntary isolation at external facilities, and targeted antiviral prophylaxis, is needed.
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. Canice Christian, Sarah Gallalee, Deandra Lee, Alyssa Bercasio, Disha Nangia and Mariam Carson contributed to these summaries. This work is volunteer based.

References:


