491. Aerosol-Generating Medical Procedures: Transmission of SARS-CoV-2 and Emerging Viruses
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Session: P-17. COVID-19 Infection Prevention

Background: During the pandemic of coronavirus disease 2019 (COVID-19), many questions arose regarding risks for hospital-acquired or nosocomial transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Aerosol generating medical procedures (AGMPs), techniques that can generate infectious, virus-laden aerosols, could potentially amplify transmission among healthcare workers (HCWs). Thus, it was widely recommended that HCWs use airborne precautions when performing AGMPs. However, in clinical settings it is often unclear what procedures constitute AGMPs and how the risk varies by procedure or pathogen. We set out to further define AGMPs and assess the risk for nosocomial transmission of SARS-CoV-2 and other high-risk viruses via AGMPs.

Methods: We identified potential AGMPs and emerging viruses that were high-risk for nosocomial transmission through reviewing experimental and clinical data. Potential AGMPs were those associated with previous virus transmission or mechanically capable of transmission. High-risk viruses were defined as those that cause severe disease in humans for which limited therapies or interventions exist, are infectious via aerosols in humans or non-human primates (NHPs), found in the respiratory tract of infected humans or NHPs, and had previous evidence of nosocomial transmission.

Results: We identified multiple potential AGMPs, which could be divided into those that generate aerosols or induce a patient to form aerosols, as well as eight families of high-risk viruses. All of the viruses were emerging zoonotic RNA viruses. In the family Coronaviridae, we identified potential evidence for SARS-CoV-1, MERS-CoV, and SARS-CoV-2 transmission via AGMPs. SARS-CoV-1 and SARS-CoV-2 were also found to be similarly stable when aerosolized.

Conclusion: Multiple emerging zoonotic viruses pose a high risk for nosocomial transmission through a variety of AGMPs. Given the similar stability of SARS-CoV-2 with SARS-CoV-1 when aerosolized and prior nosocomial transmission of SARS-CoV-1 via AGMPs, we suspect that certain AGMPs pose an increased risk for SARS-CoV-2 transmission. Additional experimental studies and on-site clinical sampling during AGMPs are necessary to further risk stratify AGMPs.

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492. Canadian consensus of COVID-19 policy and management aspects
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Session: P-17. COVID-19 Infection Prevention

Background: As evidence rapidly changes, a need for consensus in hospital policy and management aspects of COVID-19 patient care are needed. This study describes areas where consensus exists and is needed in infection control, and occupational health policy.

Methods: An online survey was sent to the membership of the Association of Medical Microbiology and Infectious Disease (n ~700). The survey included questions about COVID-19 patient and outbreak management, personal protective equipment (PPE), and occupational health considerations.

Results: Our preliminary results (n=24) were from infectious disease MD/NP or infection control medical directors. All respondents agreed treatment of COVID-19 patients should only occur in the context of a clinical trial. Of 18 centers with neonatal populations, the majority (64.2%) did not have any neonatal specific treatment guidelines. Well-babies born to COVID-19 positive moms, are all being tested (16 of 10 respondents). Variation in practice on when to remove a patient from additional precautions and potential aerosol generating medical procedures (Table 1, 2). Universal masking is in place for all clinical staff (100%), non-clinical staff (70.8%), essential visitors or patient caregivers (70.8%), and universal eye protection is in place for clinical staff (93.3%), but there was a lack of consensus in PPE conservation strategies (Table 3). Most staff do not use neck PPE (68.2%), however there was comments of it being requested by anesthesiologists at 2 sites (Table 2). Healthcare trainees or workers in these groups were restricted from caring for COVID-19 patients; Age >65 years (54.3%) and immunocompromised status (54.5%). COVID-19 positive staff can return to work 14 days after symptom onset (84.2%).
Table 1. Areas of COVID-19 management lacking consensus. Not all respondents answered every question. The percentage in brackets was calculated with the number of respondents per question as the denominator.

| Areas lacking consensus for COVID-19 management | Number N=24 (%) |
|-----------------------------------------------|-----------------|
| When you consider removing a patient with COVID-19 from additional precautions? |
| • At least 14 days from symptom onset or first positive test whichever is longer | 11 (45.8) |
| • At least 2 negative NPS (24h apart) after 14 days from symptom onset or first positive test | 5 (20.8) |
| • At least 3 days asymptomatic (excluding post viral cough) | 3 (12.5) |
| • At least 14 days from symptom onset or symptom resolution, whichever is longer | 1 (4.2) |
| • At least 28 days from symptom onset when no follow-up testing is done | 1 (4.2) |
| • Other single responses |
| • At least 10 days asymptomatic (excluding post viral cough) | 1 (4.2) |
| • Asymptomatic (with exception of post viral cough) and two negative NP swabs taken 24 hours apart | 1 (4.2) |
| • 10 days after symptom onset if never hospitalized/unwell | 1 (4.2) |
| • 40 days post symptom onset or 2 negative swabs 24 hours apart | 1 (4.2) |
| • 14 days from symptom onset and asymptomatic X 3 days whichever is longer | 1 (4.2) |
| • Variable approach depending on patient characteristics (inpatient vs. outpatient, adult vs. child, immunocompromised, etc.) | 1 (4.2) |

Populations of asymptomatic testing (n=21)

| In patient requiring high risk surgery (e.g. ENT surgery) to dictate PPE requirements or delay of surgery | 15 (71.4) |
| In patients undergoing a planned AGMP (e.g. elective intubation) to dictate NPS use | 11 (52.4) |
| Transfer to acute care from LTCF (long term care facilities) | 9 (42.9) |
| Discharging from acute care to LTCF (long term care facilities) | 8 (38.1) |
| Pre-bone marrow transplant recipient | 8 (38.1) |
| Babies born to COVID-19 positive mom | 6 (28.6) |
| Health care worker returning post exposure to COVID case | 5 (23.8) |
| Pre-bone marrow transplant + donor | 5 (23.8) |
| All admissions | 5 (23.8) |
| Pre-immunosuppression | 5 (23.8) |
| Pre solid organ donor + recipient | 2 (9.5) |
| Pre solid organ donor – donor | 2 (9.5) |
| Health care worker returning from working at other facilities (e.g. long term care facilities) | 1 (4.2) |

Duration of unlikley COVID-19 survival on mask (n=18)

| ≤2 days | 5 (27.8) |
| 3 days | 8 (44.4) |
| ≥3 days | 5 (27.8) |

Threshold for outbreak to be declared over (n=21)

| 14 days from last new case in staff and/or patients whichever is last | 9 (40.9) |
| 28 days from last new case (2 incubation periods) in staff and patients whichever is last | 8 (36.4) |
| 28 days (2 incubation periods) from last new case in patients | 3 (13.6) |
| 14 days from last new case in patients | 3 (13.6) |
| 7 days from last new case in patients (typical symptom onset interval) | 2 (9.1) |

Using powered air-purifying respirators (PAPRs) for aerosol generating procedures involving COVID-19 (n=24)

| Neck personal protective equipment (n=16) |
| No | 16 (69.6) |
| Only for incubator or code blue stations | 12 (50.0) |
| Only for anesthesia | 12 (50.0) |
| Hair covers/bouffants (n=23) |
| No | 10 (43.5) |
| Yes | 3 (13.0) |
| No response | 6 (26.3) |

Table 2. Personal protective equipment (PPE) conservation strategies (n=24). Not all respondents answered every question. The percentage in brackets was calculated with the number of respondents per question as the denominator. NA corresponds to the question not asked in the survey.

| PPE Conservation Strategy | N95 respirators N (%) | Surgical masks N (%) |
|---------------------------|-----------------------|---------------------|
| No reuse - For single patient encounter only | 9 (37.5) | NA |
| Extended use - Use in between multiple patients | 11 (45.8) | NA |
| Reprocessed and returned back to same use | 3 (12.5) | NA |
| Reprocessed and given to any healthcare worker | 1 (4.2) | NA |
| Maximum duration of use is until becomes wet or visibly soiled | 19 (79.2) | NA |
| Planning for potential reprocessing | 13 (54.2) | 1 (4.2) |

Methods of reprocessing:

- STERS/STERrad machine |
  - 10 (41.7) |
  - Hydrogen peroxide |
  - 4 (25) |
  - Steam |
  - 2 (12.5) |
  - UV disinfectant |
  - 1 (4) |

Conclusion: Across Canada, while there are areas of consensus in outbreak definitions, universal masking of clinical staff. There is significant variation in practice with respect to discontinuing additional precautions or outbreak measures, asymptomatic testing, AGMP definitions, PPE conservation strategies including reprocessing. As evidence evolves, national infection control guidelines will be important to improve standardization of practice and optimize patient care and staff safety.

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493. Clinical and Epidemiological Features of Healthcare Workers Detected with Coronavirus Disease
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Session: P-17. COVID-19 Infection Prevention

Background: Data early in the SARS-CoV-2 pandemic suggested frontline healthcare workers (HCW) may account for 10–20% of all infections. CDC estimated 400,000 infections in HCWs. Symptom screening is a strategy to prevent healthcare-associated transmission. This method may not identify asymptomatic or pre-symptomatic HCWs.

Methods: We conducted a prospective cohort study in asymptomatic or minimally symptomatic healthcare workers in a 1541-bed academic medical center. Although recruitment began in designated COVID-19 units, we expanded to all HCW providing care to hospitalized patients during the pandemic. Data was gathered on demographics, work area in the hospital and daily questionnaires were sent listing symptoms of SARS-CoV-2. Protocol included twice weekly self-collected nasopharyngeal swab and saliva for SARS-CoV-2 N1 and N2. Those with positive PCR result, underwent changes in smell and taste preceded the positive PCR test in 2 (12%). One HCW reported developing a fever with acute illness. All were notified about their PCR positive status by institution’s occupational health department and self-isolated to monitor for symptoms.

Results: A total 525 HCWs began the study protocol and 16 were identified as PCR positive. Samples included concordant saliva and NP samples on 9 (56%), exclusively NP samples on 5 (31%) and 2 (12%) HCWs were positive by saliva only. Majority were female, and all were nursing staff; with 19% reported not fully symptomatic healthcare workers in a 1541-bed academic medical center. Although recruitment began in designated COVID-19 units, we expanded to all HCWs providing care to hospitalized patients during the pandemic. Data was gathered on demographics, work area in the hospital and daily questionnaires were sent listing symptoms of SARS-CoV-2. Protocol included twice weekly self-collected nasopharyngeal swab and saliva for SARS-CoV-2 N1 and N2. Those with positive PCR result, underwent changes in smell and taste preceded the positive PCR test in 2 (12%). One HCW reported developing a fever with acute illness. All were notified about their PCR positive status by institution’s occupational health department and self-isolated to monitor for symptoms.

Conclusion: The spectrum of disease in this HCW cohort is similar to mild disease in the community. Due to high incidence of asymptomatic or mildly symptomatic HCWs, active surveillance with routine testing proves beneficial to prevent hospital transmission of SARS-CoV-2. Universal masking significantly decreased the HCW positive rate in our study, underscoring the need for universal efforts to mitigate hospital transmission of SARS-CoV-2. Symptom screening is a strategy to prevent healthcare-associated transmission. This method may not identify asymptomatic or pre-symptomatic HCWs.

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494. COVID-19 Outbreak: A Tale of Two Psych Units
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Background COVID infections in inpatient psychiatry units present unique challenges during the pandemic, including behavioral characteristics of the patients, structural aspect of the unit, type of therapy for the patients. We present COVID outbreaks in psychiatry units in two hospitals in our medical center in Bronx, NY, and describe our mitigation strategies.