COVID-19 Obstetric Practice Recommendations

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Guidance for obstetric providers is evolving rapidly.

Clinical recommendations about COVID-19 are quickly developing, thereby challenging efforts to encapsulate the information. The following guidance for obstetric providers supplements CDC recommendations.

- Pregnant women should be regularly screened for symptoms consistent with an upper respiratory infection; any symptom should result in testing of a nasopharyngeal swab for SARS-CoV-2, the virus that causes COVID-19. In some areas, testing is only available to hospitalized patients and not to people with upper respiratory symptoms consistent with COVID-19. More testing of those who are sick, both ambulatory and hospitalized, makes sense.
- All women scheduled for induction or cesarean delivery and their support person should be screened for symptoms 24 to 48 hours before arrival at the hospital and rescreened prior to entry to labor and delivery. If the woman screens positive for symptoms and SARS-CoV-2, induction and cesarean should be rescheduled if possible.
- All hospitalized women and their support person should be screened for symptoms daily. If the pregnant woman screens positive for symptoms, she should have a nucleic acid test for SARS-CoV-2; and if the support person screens positive, he or she should be sent home. If the nucleic acid SARS-CoV-2 tests were sufficiently available, the support person with symptoms of a viral upper respiratory infection would have such testing.
- For pregnant women with COVID-19, betamethasone administration should be limited to those at high risk for preterm delivery within 7 days and only given between 23 weeks' and 33 weeks and 6 days' gestation. Women at risk for preterm delivery at 34 weeks to 36 weeks and 6 days should not receive betamethasone.
- If cervical ripening is required, outpatient regimens should be prioritized.
- One support person, appropriately masked, should be permitted at the hospital.
- Neuraxial anesthesia is an optimal approach to labor anesthesia. Nitrous oxide should not be used because it might cause aerosolization of respiratory secretions.
- Labor management and timing of delivery need not be altered during the pandemic. However, pregnant women with moderate or severe COVID-19 that is not improving may experience modest respiratory improvement if they are delivered preterm.
- Healthcare workers who are pregnant should stop face-to-face contact with patients after 36 weeks' gestation.

COMMENT

Most prenatal visits can be provided through telemedicine if the patient has a home blood pressure cuff and can reliably use it. In-person visits may be required for blood testing, ultrasound assessment, anti-Rh immunoglobulin administration, and group B streptococcus screening. One possible regimen is to limit in-person prenatal visits to 12, 20, 28, and 36 weeks' gestation (the postpartum visit may also be conducted using telemedicine). CDC and the American Academy of Pediatrics recommend that, for a COVID-19-positive mother, joint decision making should be used to decide whether to support the baby rooming in with the

mother or to practice separation of mother and baby at birth to reduce the risk for infection from mother to newborn. There is no evidence that breast milk contains infectious virus. One option is for the mother to provide expressed breast milk. A healthy adult can bottle feed the baby until the mother's infection precautions are discontinued.

Convalescent Plasma Therapy in Patients with Severe COVID-19

Anthony L. Komaroff, MD reviewing Duan K et al. Proc Natl Acad Sci U S A 2020 Apr 6

A preliminary report on 10 Chinese patients suggests benefit.

Immunotherapy with neutralizing antibodies present in convalescent plasma (CP) proved to be effective and safe for patients with SARS (severe acute respiratory syndrome), MERS (Middle East respiratory syndrome), and the 2009 H1N1 influenza viruses. To test whether CP would benefit COVID-19 patients as well, researchers in Wuhan, China, performed a study in 10 severely ill COVID-19 patients who also received many different antivirals. Median age of the patients was 53, 4 had chronic illnesses, and 3 were on ventilators.

Within 3 days of CP therapy, most patients exhibited improved clinical symptoms, higher levels of blood oxygen and lymphocytes, lower C-reactive protein levels, undetectable viral loads, and improved chest computed tomography scans; two patients were weaned from ventilators. Treatment was particularly successful if CP was given within 14 days of symptom onset; no adverse effects were noted. The investigators assembled a historical control group of 10 COVID-19 patients in the same hospitals and of the same age, sex, and disease severity. Of the 10 CP-treated patients, 3 were discharged and 7 were much improved, whereas in the control group, 3 patients died, 6 were stable, and 1 improved.

COMMENT

This small series provides some encouragement that convalescent plasma (CP) therapy might be effective and safe for severely ill COVID-19 patients, particularly if it is started within the first 14 days of symptom onset. These results back up smaller uncontrolled case studies (e.g., NEJM JW Infect Dis Jun 2020 and *JAMA* 2020 Mar 27; [e-pub]). If further studies confirm that CP is beneficial, can enough CP be collected to make a substantial difference in an epidemic of this magnitude? That remains to be seen.

Surgical Masks Provide Source Control of Respiratory Viruses

Richard T. Ellison III, MD reviewing Leung NHL et al. Nat Med 2020 Apr 2 Bae S et al. Ann Intern Med 2020 Apr 6

Surgical face masks were found to reduce presence of influenza and coronavirus RNA in respiratory droplets and aerosols from infected individuals.

The CDC has just recommended that the general U.S. population begin wearing cloth face coverings to decrease the community-based transmission of the SARS-CoV-2 virus. Two new studies provide some support for the CDC guidelines.

In the first, researchers at a Hong Kong hospital obtained nasal and throat swabs and respiratory droplet and aerosol samples from 246 individuals with presumed symptomatic acute respiratory viral infection seen year-round between March 2013 and May 2016. During a 30-minute collection of exhaled breaths when patients were breathing and coughing normally, 124 individuals were wearing a face mask and 122 were not; 49 provided second 30-minute samples of the alternate type.

By reverse transcriptase polymerase chain reaction (RT-PCR) there were 54 individuals with rhinovirus infection, 43 with influenza infection, and 17 with human seasonal coronavirus infection. For all three viruses, the viral load was higher in nasal than in oral secretions, and all three viruses were detectable in both respiratory droplet (particles >5 μm) and aerosol (particles <5 μm) fractions of the exhaled breath. Masks led to a notable reduction in the number of RT-PCR–positive respiratory droplet and aerosol samples for patients with either coronavirus (in respiratory droplets, from 30% to 0%; aerosols, 40% to 0%) or influenza infection (respiratory droplets, 26% to 4%; aerosols, 35% to 22%); there was no meaningful reduction seen with rhinovirus infections. Influenza virus was able to be grown from 4 of 5 studied RT-PCR–positive aerosol samples from individuals not wearing masks.

The second study, by Bae and colleagues, recruited 4 patients with SARS-CoV-2 infection to cough five times onto petri dishes containing viral transport media approximately 20 cm from their face while wearing either no mask, a surgical face mask, or a two-ply cotton mask. The median nasopharyngeal viral load was 5.66 log copies/mL, and the cough samples found viral loads of 1.4 to 3.5 logs/mL whether or not a mask was present for three of the four patients. Swabs of the outer surfaces of both types of masks were positive for all four patients.

COMMENT

The work by Leung raises the theoretical concern of viral transmission through aerosols as well as respiratory droplets although, as the authors note, there was no attempt to grow either coronavirus or rhinovirus from the RT-PCR respiratory samples to confirm the presence of viable virus. Still, this novel study provides strong evidence that the use of surgical masks can provide source control for both human coronavirus and influenza virus infections when individuals are sitting for 30 minutes. In contrast, the very small study by Bae shows that neither surgical nor cotton face masks will prevent the spread of virus from a coughing individual — at least at a distance of only 20 cm. While both studies have clear limitations, together they suggest that the use of a surgical face mask can provide some source control in individuals infected with coronavirus or influenza, although the efficacy is likely diminished in coughing individuals (and we can't extrapolate the findings to other types of masks). Still,

in my mind these limited data do support the broad use of face masks until this pandemic is brought under control.

Presymptomatic Transmission of SARS-CoV-2

Stephen G. Baum, MD reviewing Wei WE et al. MMWR Morb Mortal Wkly Rep 2020 Apr 1

Transmission of the novel coronavirus SARS-CoV-2 can occur before symptom onset in the infector and is a confounding phenomenon in efforts to contain spread.

Transmission of respiratory pathogens from asymptomatic persons to recipients no doubt occurs in many types of infection. For example, chickenpox is highly contagious several days before the classic rash erupts and is likely spread by varicella virus from the respiratory tract (although this has rarely been documented). As part of the current multifaceted exploration of the pathogenesis of the novel coronavirus SARS-CoV-2, researchers attempted to document whether this virus could be spread in the asymptomatic phase of infection. The subset of asymptomatic transmitters of infection they chose were patients who ultimately became symptomatic. Therefore, transmission from these patients was dubbed presymptomatic.

Investigation of all 243 cases of COVID-19 reported in Singapore from January 23 through March 16, 2020, revealed seven clusters of cases in which presymptomatic transmission seemed the most likely mode of spread. Detailed epidemiologic histories ruled out contact of the cluster members with any other source other than the person who was presymptomatic at the time of contact. Clusters contained from 2 to 5 patients each and involved such contact as churchgoing with common or proximate seating, common singing class, and transmission to a spouse or home partner after contact with a traveler. In 4 of the 7 clusters, exposure occurred 1 to 3 days before the source patient developed symptoms. In 157 of the 243 cases, local acquisition in Singapore was the cause.

COMMENT

Even in this early phase of the COVID-19 pandemic, several studies have now strongly indicated asymptomatic and presymptomatic transmission of the virus in several cases. The existence of contagion before symptoms appear makes widespread testing and case–contact identification coupled with social distancing essential, especially in areas where infection has not erupted yet.

Absence of SARS-CoV-2 Contamination of Personal Protective Equipment

Richard T. Ellison III, MD reviewing Ong SWX et al. Infect Control Hosp Epidemiol 2020 Mar 26

Equipment worn into the rooms of COVID-19 patients tested negative for viral contamination.

The terrible shortage of single-use, personal protective equipment (PPE) — such as eye protection, gowns, gloves, and, in particular, surgical masks and N95 respirators — during the current COVID-19 pandemic has forced healthcare facilities to consider reusing or extending the use of some PPE items. However, determining the safety of this approach depends first on knowing the level of contamination of these items.

To that end, investigators at a Singapore hospital evaluated samples collected with sterile swabs from the front surfaces of goggles, N95 respirators, and shoes worn by 30 healthcare workers (doctors, nurses, and cleaners) who had entered the rooms of 15 patients with polymerase chain reaction (PCR)–confirmed SARS-CoV-2 infection.

All 90 samples tested negative for SARS-CoV-2 by PCR. The providers had been in the rooms for a mean of 6 minutes; activities included physical examinations, collecting respiratory samples, administering medications, and cleaning. None of the patients were on ventilatory support, and no aerosol-generating procedures had been performed.

COMMENT

This study was limited by its small size and the use of only surface swabs to collect samples, as opposed to more comprehensive methods, and by including only patients in airborne infection isolation rooms with 12 air exchanges per hour, as opposed to less-controlled environments. However, the results support efforts to conserve the supply of N95 respirators by approaches such as extended use and disinfection protocols.

SARS-CoV-2 Replication at Different Body Sites

Mary E. Wilson, MD reviewing Wölfel R et al. Nature 2020 Apr 1

The virus replicates in the upper respiratory tract and can persist in sputum after clearance from the throat.

To clarify the pathogenesis of COVID-19, researchers in Germany conducted a virologic analysis of serial samples from nine young to middle-aged hospitalized patients with epidemiologically linked, reverse-transcriptase–polymerase chain reaction (RT-PCR)–confirmed SARS-CoV-2 infections (all had known contacts to an index case) and without significant underlying disease. Except for one initially asymptomatic patient, all had mild symptoms, including cough, fever, and diarrhea. Four developed disorders of taste, smell, or both, and one reported dyspnea.

All naso- and oropharyngeal swabs obtained during the first 5 symptomatic days were positive (average viral RNA load, 6.8×10^5 copies/swab; maximum, 7.1×10^8). Detection rates dropped to 40% after day 5, with one swab testing positive 28 days after onset. Paired swab and sputum samples taken 2 to 4 days after symptom onset showed higher virus concentrations in swab (2 patients), higher virus concentrations in sputum (2 patients), or similar concentrations in both (5 patients). Virus was readily isolated during the first week (17% of swabs and 83% of sputum samples), but no virus was isolated from samples obtained after day 8 despite continued positivity by RT-PCR. Stool RNA was positive; although no virus was isolated, high levels suggested active replication in the gastrointestinal tract. Stool and sputum remained RNA positive throughout 3 weeks. Seroconversion occurred in 50% of patients by day 7 and 100% by day 14. Sequencing of viral genomes revealed distinct genomes in throat and sputum samples, suggesting independent viral replication in throat and lung.

COMMENT

Despite this study's small size, the authors' use of different approaches to analyze multiple samples from various body sites over time beginning early in the clinical course of COVID-19 provides valuable insights into the viral kinetics and pathogenesis of SARS-CoV-2 infection. High viral loads present in the throat during early mild or prodromal stages help to explain the more-efficient transmission of SARS-CoV-2 relative to SARS-CoV.