COVID-19 and Newborns: A Panel Discussion

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Introduction / Ground Rules

• This session has been organized around many of the questions submitted during the registration process
• COVID-19 guidelines are rapidly evolving and changing constantly
• Recommendations need to be adapted to local context and resources
• We will try to provide a snapshot of what has been done at some of our local sites/institutions
• We are not the experts, but we do have experience at our local sites

Moderator: Lana Ismail, MD, FAAP
Children's National Hospital

Outline of Session

• Panel Introductions
• Transmission
• Clinical Presentation of Newborns
• Separation vs Rooming-In
• Discharge Planning
• Testing
• PPE and Isolation Precautions
• Additional Q&A / Discussion
Panel Introductions

Describe your clinical setting and academic environment.

Transmission

- Perinatal COVID-19 database of 1500 births reported, 2-3% infants test positive within first 24-96 hours of life
  - Systematic Review by Handley et al in August 2020 Obstetrics and Gynecology of published studies from China, US and Italy; reviewed data of 538 pregnancies (and 435 subsequent deliveries) complicated by SARS-CoV-2
    - Definition of vertical transmission – positive SARS-CoV-2 swab in neonate within 5 minutes of birth or + IgM for SARS-CoV-2 in umbilical cord blood sample
    - Chinese data represents 80% of reported neonatal outcomes
    - 20% neonates born prematurely; NICU admission rate of 64.9%, 5 minute Apgar < 7 = 0.5%, mortality 0.3%; NP RT-PCR Swab + = 0% (310 infants)

- Recently published case reports of SARS-CoV-2 perinatal infection in neonates with route of transmission unclear – transplacental, transcervical, or environmental
  - Nature Communications published a case report from France in July 2020 of a 23 yo G1P0 admitted at 35 weeks gestation symptomatic with SARS-CoV-2
    - NP, Vagal and blood specimens all positive with RT-PCR for SARS-CoV-2
    - Neonate born by C-section due to NRFHT, and required resuscitation with PPV and intubation
    - Blood and BAL specimens obtained, along with NP specimens at 1H, 3 days and 18 days for RT-PCR - ALL positive for SARS-CoV-2
Transmission

Nature Communications case report (continued)
- Day 3 of life, infant developed sudden onset neurological symptoms - irritability, poor feeding, increased tone and opisthotonus
- CSF demonstrated elevated WBC, mild elevation in protein
- Bacterial, fungal and HSV studies neg on CSF
- Babesia neg, TBE neg
- MRI abnormal on DOL 11 - with gliosis of deep white periventricular and subcortical matter
- No viral or other etiologies identified, spontaneous improvement of symptoms
- Follow up at 2 months demonstrated continued improvement (poutent but improving hypertonia) and MRI improving with decreased white matter injury
- RT-PCR on placenta positive for SARS-CoV-2 with higher viral load than in mother or infant
- Placental pathology abnormal with infarcts, acute and chronic interstitial, fibrin depositions

Transmission

AAP Clinical Guidance:
FAQs: Management of Infants Born to Mothers with Suspected or Confirmed COVID-19

“The AAP strongly supports breastfeeding as the best choice for infant feeding. Several published studies have detected SARS-CoV-2 nucleic acid in breast milk. It is not yet known whether viable, infectious virus is excreted in breast milk, nor is it yet established whether protective antibody is found in breast milk. Given these uncertainties, breastfeeding is not contraindicated at this time.”

Transmission

Still a lot of unanswered questions
- Is the data from China representative of what we will see as virus mutates/clinical conditions change based on US population
- AAP/NONPM registry for surveillance and epidemiology of Perinatal COVID-19 infection
- Ongoing studies
  - PRIORITY study UCSF – Pregnancy Coronavirus Outcomes Registry – nationwide study of pregnant or recently pregnant people who are under investigation for or confirmed cases of COVID-19
  - Online questionnaires, follow up as many as 7 times within 12 months
- Priority.UCSF.edu
Transmission

References:

doi: 10.1097/AOG.0000000000004010

https://doi.org/10.1038/s41467-020-17436-6

Clinical Presentation of Newborns

Huntley et al. Systematic Review

• Summarizes 13 articles that include 538 pregnancies with confirmed SARS-CoV2
  with reported outcomes on 435 deliveries
  • Includes published reports through April 29, 2020
  • 10 from China, 2 US, 1 Italy
• Results:
  • 20.1% Preterm births
  • 54.7% Caesarean sections
  • 64.9% neonates admitted to the NICU however 5-minute APGAR <7 was 0.5%
  • Vertical transmission rate of 0.0%
  • Neonatal death rate of 0.3% (1 death)
Smith et al. Systematic Review

- Summarizes 9 articles that included 92 pregnancies with confirmed SARS-CoV2
  - All from China
- Results
  - 63.8% Preterm births
  - 80% Caesarean sections
  - 76.92% neonates admitted to the NICU
  - 42.8% had low birth weight
  - 2 deaths (1 neonatal, 1 stillbirth)
  - 1 tested positive for SARS-CoV2

Zimmerman et al. Systematic Review

- Summarizes 9 case series and 2 case reports that included 65 pregnancies with confirmed SARS-CoV-2 and outcomes on 67 neonates
  - All from China
- Results
  - 37% Preterm births
  - Neonatal complications:
    - Respiratory distress (18%)
    - DIC (3%), asphyxia (2%)
  - 2 perinatal deaths
  - 4 neonates were SARS-CoV-2 positive despite strict infection control and separation after delivery
    - 1 healthy
    - 1 developed pneumonia

AAP SONPM National Perinatal COVID Registry

- National Perinatal COVID-19 (NPC-19) Registry
  - Open to all sites taking care of infants
  - Solute de-identified maternal and neonatal data as it pertains to perinatal COVID-19
- For more information or to join/submit data to the registry, see the SONPM home page: [https://services.aap.org/en/community/aap-sections/sonpm/](https://services.aap.org/en/community/aap-sections/sonpm/)
AAP SONPM National Perinatal COVID Registry

As of July 25, 2020:
231 sites
2067 mother/infant dyads

Approximately 2% positive rate
Preliminary Review of the Data: “Very little difference in positivity rates as a function of maternal condition on admission or separation/non-separation.”

Infant SARS-CoV-2 Testing:
Yes: 1806 (36 Positive in hosp)
No: 241 (20 not reported)
Raba et al. Systematic Review

- Summarizes 18 articles that include 160 infants (<1yo) with confirmed SARS-CoV-2
  - Includes published reports through April 7, 2020
  - 17 from China, 1 from Vietnam

- Results:
  - 16% asymptomatic, main clinical symptoms: fever (56%) and cough (33%)
  - 7% admitted to ICU, 1 death
  - 5 neonates (<28 days)
  - 4 born via c-section were positive within 48 hours of life
  - Pneumonia-like pictures on CXR and CT scan
  - No deaths

Case Series

- Dong et al. (China): 10.6% of those <1yo were severe and critical cases (higher rate than other age groups)
- McLaren et al. (NYC): 7 febrile infants <60 days old with confirmed SARS-CoV-2 infection, none with severe outcomes, 3 treated for pneumonia (41%)
- White et al. (Colorado): 3 patients between 17-33 days presenting with fever, rhinorrhea and hypoxia requiring supplemental oxygen, all developed neutropenia, favorable outcomes
- Zachariah et al. (NYC): 14 (28%) were <1yo, none with severe disease
- Biagioni et al. (Washington, DC): 14 (20%) were <1yo, none with severe disease
- Modell et al. (France): 2 infants hospitalized for COVID-19 (<3 months old and one 2 months old), all presented with fever, only 1 required surgery
- Field et al. (NV): 3 febrile infants <2 months of age. Presented with fever, feeding difficulty, lymphopenia and thrombocytosis, 2/3 with neutropenia, all with unremarkable courses
Single Case Reports

DeRosa et al. – 366 in-hospital personnel with low grade fever found to have similar involvement (cleaved cryptogenic and mild perinatal illness) but unusual symptomatology.

Pier et al. – 100 patients with bilateral breathing, hypoxemia, and mild hyperlactacidemia, treated with HFNC and antibiotics, discharged after 6 days; four found to have human metapneumovirus.

Lemus et al. – Term infant developed lethargy and fever after 24h, became encephalopathic, improved and discharged home.

Swell et al. – 255 neonates born via Caesarean section with severe hypoxemia (periodic cyanosis) and poor feeding, treated with respiratory distress, requiring respiratory support (NC), CRV with ground glass opacities.

Moura et al. – 39 thalassemic infant (born at 34 weeks) presented with nasal congestion, cough, poor feeding, hypopnea, hypotension, and hypothermia. She responded to pressure support, improved, discharged on day 5.

Summary

• For AAP updated FAQ: “Current data suggest that approximately 2-5% of infants born to women with COVID-19 near the time of delivery have tested positive in the first 24-96 hours after birth.”

• No reported deaths due to perinatally acquired COVID-19

• More outcome data needed on those that tested positive perinatally to understand risk in the neonatal population

• Infants (<1yo) may be at higher risk for hospitalization and more serious disease than older children, however majority still have a mild disease course

References


References cont.


Meslin, Pauline MD; Guiomard, Clara MD; Chouakria, Mouna MD; Porcher, Julie MD; Duquesne, Frederique MD; Tiprez, Catherine MD; Zemouri, Neila MD. Coronavirus Disease 2019 in Newborns and Very Young Infants, The Pediatric Infectious Disease Journal: July 2020 - Volume 39 - Issue 7 - p e145-e147

Separation vs. Rooming-In

**WHO Guidelines**
- Infants remain in close contact with mother with early initiation of breastfeeding

**CDC Guidelines (April 2020–early May 2020):**

*The many benefits of mother-infant skin-to-skin contact are well understood for mother-infant bonding, increased likelihood of breastfeeding, stabilization of glucose levels, and maintaining infant body temperature...*

*Though transmission of SAR-CoV-2 from mother to infant via contact with infectious respiratory secretions is a concern, the risk of transmission and the clinical severity of SAR-CoV-2 infection in infants are not clear.*

*The determination of whether or not to separate a mother with known or suspected COVID-19 and her infant should be made on a case-by-case basis using shared decision-making between the mother and the clinical team.*

Considerations in this decision include:
- The clinical condition of the mother and of the infant
- SARS-CoV-2 testing results of mother (confirmed vs. suspected) and infant (a positive infant test would negate the need to separate)
- Desire to feed at the breast
- Facility capacity to accommodate separation or co-location
- The ability to maintain separation upon discharge
- Other risks and benefits of temporary separation of a mother with known or suspected COVID-19 and her infant
Separation vs. Rooming-In

• CDC Guidelines (Updated May 20, 2020)

"Although it is well recognized that the ideal setting for care of a healthy term newborn while in the hospital is within the mother's room, temporary separation of the newborn from a mother with confirmed or suspected COVID-19 should be strongly considered to reduce the risk of transmission to the neonate…

...Temporary separation in the clinical setting can be achieved in many ways, including a separate room, maintaining a physical distance of 6 feet between the mother and neonate, and placing the neonate in a temperature-controlled isolette if the mother remains in the mother’s room…

...the risks and benefits of temporary separation of the mother from her baby should be discussed with the mother by the healthcare team, and decisions about temporary separation should be made in accordance with the mother's wishes…"
Separation vs. Rooming-In

• AAP Guidelines
  • Temporary separation of mother and newborn to minimize risk of infection from maternal respiratory secretions.
  • Mother may choose to room-in despite recommendations.
  • Risk to mother and infant.
  • Infant source of infection is to separate mother and infant at least temporarily. (Provides time for mother to become less infectious and minimizes likelihood of infant becoming infected.)
  • R. and discussion with the clinical care team: the mother chooses to room-in...

Revised 5/21/20
• Mothers and newborns may room-in according to usual center practice.
• Mother who is acutely ill may not be able to care for infant safely, may be appropriate to temporarily separate mother and newborn or to have the newborn cared for by non-infected caregivers in mother’s room.

Separation vs. Rooming-In

• AAP Guidelines
  • Driven by evidence and data.
  • Likelihood that infant is positive similar for those separated from mother and those who room-in (with infection prevention measures).
  • Evidence suggests that risk of newborn acquiring infection during birth hospitalization is low.
  • Risk appears to be no greater if mother and infant room-in together using infection control measures compared to physical separation of the infant in a room separate from the mother.

Separation vs. Rooming-In

• National survey to various AAP Section Interns (SONPM, SOB, SOHM) at end of May 2020

<table>
<thead>
<tr>
<th>Care of Mother and Infant</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care of mother and infant in separate rooms</td>
<td>31.5</td>
</tr>
<tr>
<td>Care of mother and infant in the same room with some precautions to maintain separation</td>
<td>17.9</td>
</tr>
<tr>
<td>Care of mother and infant in the same room, with no precautions</td>
<td>0.3</td>
</tr>
<tr>
<td>Decision based on shared decision making on a case-by-case basis</td>
<td>48.7</td>
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## Separation vs. Rooming-In

**National survey to various AAP Section listservs (SONPM, SOBr, SOHM) at end of May 2020**

<table>
<thead>
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<th>Location of newborn care</th>
<th>N (%)</th>
</tr>
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<tbody>
<tr>
<td>Care of mother and infant in separate rooms</td>
<td>105 (23.9%)</td>
</tr>
<tr>
<td>Care of mother and infant in the same room with some precautions to maintain separation</td>
<td>128 (29.2%)</td>
</tr>
<tr>
<td>Care of mother and infant in the same room, with no precautions</td>
<td>8 (1.8%)</td>
</tr>
<tr>
<td>Decisions based on shared decision making on a case-by-case basis</td>
<td>179 (40.8%)</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Approach to direct breastfeeding</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prohibited</td>
<td>4 (0.9%)</td>
</tr>
<tr>
<td>Discouraged, but permitted if family strongly desires</td>
<td>34 (7.7%)</td>
</tr>
<tr>
<td>Encouraged with precautions</td>
<td>65 (14.9%)</td>
</tr>
<tr>
<td>Decisions based on shared decision making on a case-by-case basis</td>
<td>179 (40.8%)</td>
</tr>
</tbody>
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### Personal Preferences Regarding Location of Care

<table>
<thead>
<tr>
<th>Personal Preferred Approach</th>
<th>N (%)</th>
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<tr>
<td>Care of mother and infant in separate rooms</td>
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<tr>
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<td>8 (1.8%)</td>
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<tr>
<td>Decisions based on shared decision making on a case-by-case basis</td>
<td>179 (40.8%)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (0.9%)</td>
</tr>
<tr>
<td>I don't have a particular opinion about this</td>
<td>15 (3.4%)</td>
</tr>
</tbody>
</table>

### Discharge Planning
Testing

- Maternal Testing
- Newborn Testing

PPE and Isolation Precautions

Submit your questions via the Q&A box