



Reference of the Week

Chambers C. Evaluation for SARS-CoV-2 in Breast Milk from 18 Infected Women. JAMA. 08/19/2020.

<https://jamanetwork.com/journals/jama/fullarticle/2769825> pdf

Premise/Methods: **1.** It is unclear whether SARS-CoV-2 can pass from an infected mother to an infant through breast milk. **2.** It is also unclear whether SARS-CoV-2 can contaminated banked breast milk. **3.** COVID-19 positive mothers were approached to submit breast milk for sampling. **4.** Banked milking procedures were tested for live virus.

Findings: **1.** 18 COVID-19 mothers (17/18 symptomatic) provided 64 samples of breast milk at different time points following delivery. **2.** Samples were tested for SARS-CoV-2 nucleic acid (PCR) and live virus: 1 sample was PCR positive but replicating virus was not present in any sample. **3.** Breast milk for banking was spiked with live SARS-CoV-2 and neither nucleic acid nor replicating virus could be detected after pasteurization whereas virus was detected in unpasteurized samples. *This small study with significant limitations is nonetheless reassuring that SARS-CoV-2 does not appear to pass through breast milk and the virus banked milk after pasteurization.*

Other References:

- Reynolds AS. Pulmonary Vascular Dilatation Detected by Automated Transcranial Doppler in COVID-19 Pneumonia. Amer J of Resp Crit Care Med. 06/06/2020.
<https://www.atsjournals.org/doi/pdf/10.1164/rccm.202006-2219LE> pdf
Premise/Methods: **1.** COVID-19 patients can have severe hypoxemia despite limited changes in lung mechanics different than other causes of ARDS. **2.** Imaging and autopsy studies reveal pulmonary vascular proliferation and vasodilation resulting in intra-pulmonary shunt. **3.** "Bubble studies" have long been used in pediatrics to demonstrate intracardiac shunt and less commonly intra-pulmonary shunt (arteriovenous malformations and hepatic pulmonary syndrome). **4.** Transcranial Doppler (TCD) of the middle cerebral artery is used to demonstrate the presence of saline microbubbles injected into the venous system and bypassing the lungs due to shunt.
Findings: **1.** 18 adult patients on mechanical ventilation from a single site were assessed for shunt utilizing TCD: median age 59 yrs; PaO₂/FiO₂ 127 (IQR 94-173); 61% male (n=11). **2.** 83% (n=15/18) had detectable microbubbles; oxygenation inversely correlated with the number of microbubbles; and lung compliance was inversely correlated with the number of microbubbles. **3.** These findings are unique to COVID-19 ARDS and may explain the absence of dyspnea with hypoxemia early in the course of the disease. *These preliminary findings leads one to wonder whether the neurologic sequelae in COVID-19 may be due to microbubble embolization through well-described pulmonary vascular irregularities.*
- Gaeckle NT. Aerosol Generation from the Respiratory Tract with Various Modes of Oxygen Delivery. Amer J of Resp and Crit Care Med. 08/21/2020. <https://www.atsjournals.org/doi/abs/10.1164/rccm.202006-2309OC> pdf
Premise/Methods: **1.** Our knowledge of aerosol generation by oxygen delivery systems is incomplete. **2.** Aerosol generation by oxygen via nasal cannula or BIPAP support may lead to iatrogenic infection of HCWs and patients. **3.** Aerosol generation was measured with the following systems: simple nasal cannula (NC), face mask (FM), high flow nasal cannula (HF), and non-invasive positive pressure ventilation (NIPPV). **4.** Both aerosol size and concentration were measured.
Findings: **1.** 10 healthy adult volunteers performed the following maneuvers during aerosol measurements: normal breathing, talking, deep breathing, and coughing in a negative pressure room. **2.** After adjustment for multiple comparisons, the number and size of particles measured from the respiratory tract did not significantly change with the oxygen modalities tested. **3.** Only coughing increased the number of particles above background room concentration. **4.** This study suggests that risk of aerosol based respiratory infection transmission is affected more by individual respiratory system motion and inter-individual variability in particle generation, than specific oxygen therapies applied. *It is almost counterintuitive that these oxygen delivery modalities appear not to increase the number of aerosol-size particles. Considering the variation between subjects, is it possible that the super-spreader phenomenon is at least in part due to the fact that some individuals produce higher concentrations of particles with normal respiratory maneuvers?*



SEE THE ARTICLE CABINET ON THE S: DRIVE, “COVID-19 ARTICLE RESOURCE CABINET” FOR CHILDREN’S FULL COLLECTION

- Tanner T. Hyperinflammation and the utility of immunomodulatory medications in children with COVID-19. Paediatric Respiratory Reviews. 07.29.2020

Premise: COVID-19 induces a hyperinflammatory state and attempts to dampen components of inflammation are currently being undertaken. This review provides a summary of current interventions:

AGENT	TARGET	HYPOTHESIS	COMMENTS
corticosteroids (cs) [dexamethasone]	CS are non-specific in their inhibitory effects on both innate and adaptive immune responses.	Severe and critical COVID-19 are characterized by elevated pro-inflammatory interferons, cytokines, and activated inflammatory cells.	CS are utilized in hyperinflammatory autoimmune disorders and have a limited role in sepsis and ARDS.
interleukin 6 blockade (IL-6B) [tocilizumab]	IL-6 receptors are both soluble and membrane bound.	IL-6 is secreted by T-cells, binds to receptors that activate both local and systemic inflammatory pathways through membrane associated kinases.	IL-6B are successfully utilized in a wide variety of inflammatory rheumatic diseases.
interleukin 1 blockade (IL-1B) [anakinra]	IL-1 receptors are expressed on a variety of cells including neutrophils, endothelial cells, lymphocytes, and many others.	IL-1 is a potent proinflammatory cytokine that acts both locally and systemically inducing pathways of tissue destruction.	IL-1B is used in autoinflammatory diseases, malignancies, and rare genetic abnormalities.
intravenous immunoglobulin [IVIG]	IVIG blocks Fc receptors macrophage, B-lymphocytes, and other immune effector cells.	IVIG dampens complement activation and suppresses inflammatory cytokines, chemokines, and metalloproteinases.	IVIG is a mainstay of therapy for Kawasaki disease thought to inhibit complement mediated tissue damage.
convalescent plasma (CP)	Neutralizing IgG and IgM attach to virions and promote viral clearance. CP neutralizes auto-AB, limit complement activation, and neutralizes cytokines IL-1 and TNF.	Through a variety of mechanisms, CP suppresses viral infection, cytokinemia, tissue destruction, and thrombosis.	CP has been used in SARS-CoV and MERS as well as a variety of viral infections as well as influenza A (1918).

The review also delineates the clinical picture of COVID-19 in adults and children as well as MIS-C.

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