COVID-19 LITERATURE BRIEFING
March 10th, 2021: #74

Children's MINNESOTA

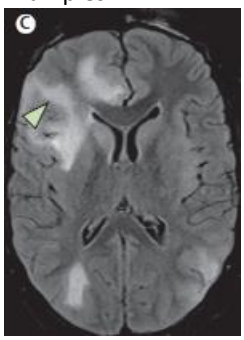
Reference of the Week

- Lindan CE. Neuroimaging manifestations in children SARS-CoV-2 infection: a multinational, multicenter collaborative study. Lancet Child and Adolescent Health. 03.2021;5:167-177. https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(20)30362-X/fulltext pdf

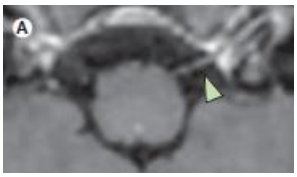
Premise/Methods: 1. In adults with COVID-19 thrombogenic reactions lead to a high incidence of ischemic stroke, intracerebral hemorrhage, and other CNS imaging findings. **2.** Case reports of CNS involvement related to SARS-CoV-2 in children have emerged but the prevalence and pattern of CNS involvement is unknown. **3.** The American Society of Pediatric Neuroradiology initiated a call for cases to better understand the neuroimaging manifestations of COVID-19 in the pediatric population. **4.** Strict criteria for case acceptance and review by multiple individuals from neurology, neuroradiology, and infectious disease were performed to assemble the collection described at length in this publication.

Findings: 1. 32 countries submitted 429 cases and 38 from 10 countries met the strict criteria required for inclusion revealing that acute-phase and delayed-phase SARS-CoV-2 infection are related to CNS abnormalities in children. **2.** Cases were grouped into four categories: acute COVID-19 (category 1; 12 [32%] children); asymptomatic acute or subacute COVID-19 (category 2; eight [21%] children); MIS-C (category 3; 11 [29%] children); or indeterminate (category 4; seven [18%] children). **3.** In all categories the most prevalent neuroimaging finding was an ADEM-like (autoimmune manifestations) with patchy T2 hyper intensity with or without abnormal enhancement and diffusion restriction. **4.** Other imaging manifestations included: neuritis, cranial nerve neuritis, myelitis, myositis, thrombo-ischemic disease, and more devastating changes in 4 patients with apparent co-infections.

Examples:

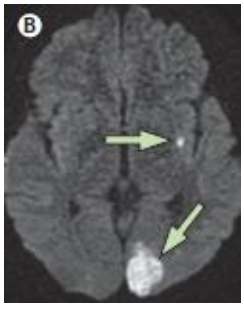


13 year old boy with ADEM-like lesions with confluent areas of high signal in the subcortical white matter with associated mass effect.



5 year old boy with multiple cranial nerve deficits and marked enhancement of the left 12th cranial nerve.

3 year old girl presenting with respiratory failure, confusion, limb weakness, and vomiting. T1 post-contrast enhancement suggesting ongoing active disease.



15 year old pregnant girl with fever, high blood pressure, seizures, and pneumonia. 7 days after presentation had small infarcts and a larger occipital infarct.

This publication includes multiple images of children with serious CNS involvement related to SARS-CoV-2 and although many of the children did well others died or had neurologic residua.

Other References:

- LaRovere KL. Neurologic Involvement in Children and Adolescents Hospitalized in the United States for COVID-19 or Multisystem Inflammatory Syndrome. JAMA neurol. 03.05.2021. https://jamanetwork.com/journals/jamaneurology/fullarticle/2777392 pdf

Premise/Methods: 1. Both peripheral and central nervous system involvement with SARS-CoV-2 was described in adults from the earliest days of the pandemic. **2.** Across case series published between March and August 14, 2020, between 6% and 58% of children and adolescents hospitalized with MIS-C developed central and/or peripheral nervous system involvement. **3.** Using the

Overcoming COVID-19 US public health surveillance registry of children and adolescents (61 hospitals) hospitalized with COVID-19–related complications, we aimed to describe the type and severity of neurologic involvement and documented hospital outcomes.
Findings: 1. 1,695 patients involvement from SARS-CoV-2 are described: median age, 9.1 years; Hispanic/Latino, 638 or 38%; non-Hispanic Black, 442 or 26%. **2.** The frequencies of previously healthy patients (195 [53%] vs 723 [54%]) and patients meeting MIS-C criteria (126 [35%] vs 490 [37%]) were similar. **3.** Patients with life-threatening neurologic conditions including severe encephalopathy (n = 15; 5 with white-matter hyper-intensities and splenial lesions), acute ischemic or hemorrhagic stroke (n = 12), acute CNS infection/ADEM (n = 8), acute fulminant cerebral edema (n = 4), and GBS (n = 4): 43 of 365 patients (12%); 20 of 43 patients (47%) had MIS-C; 3 of 43 patients (7%) had an underlying neurologic disorder; 11 of 43 patients (26%) died; and 17 of 43 patients (40%) were discharged with new neurologic deficits. **4.** 22% of patients with either SARS-CoV-2 or MIS-C had neurologic involvement and most patients had transient neurologic changes that resolved by the time of discharge, but as noted above devastating neurologic involvement can occur.

- Mulchan SS. What COVID-19 teaches us about implicit bias in pediatric health care. J of Pediatric Psychology. 03.2021;46(2):138-143. (topical review). pdf
  Premise/Methods: 1. The impact of COVID-19 on adults within marginalized communities and people of color is well documented but little is known about the impact on children. **2.** A review of the scientific literature on implicit bias in pediatric health care was integrated with a review of articles from peer-reviewed journals and news media on COVID-19 and health disparities.
  Findings: 1. Rates of pediatric HCWs implicit bias have been documented as similar to that of the general population and can negatively impact clinical decision-making and outcomes for marginalized pediatric populations. **2.** Pediatric implicit bias occurs in multiple domains of the healthcare sector: individual encounter, organizational, medical educational, and research. **3.** *Call to action:* 1) individual encounters- recognize that the higher clinical and personal demands of a pandemic results in "fast thinking" and stereotyping; manage implicit bias through self-awareness (Implicit Associations Test) and emotional regulation training; and recognize that implicit bias is difficult to change and focus on "one team approach". 2) organizational- invest in QI methods that continually provide feedback regarding clinical interactions with youth and families; encourage patient advocacy (family advisory councils); connect with communities to reduce barriers to care; and openly communicate about bias, microaggressions and eliminate fear of retaliation. 3) medical educational- revamp medical education to integrate perspective taking and empathy in all clinical rotations; and provide annual hospital-wide implicit bias training for all employees. 4) research- operational definitions and continuous feedback from participants on methodology, communication, and outcomes that may be effected by bias; and incentivize research on implicit bias in the pediatric setting through improved funding mechanisms during the pandemic.
  Consider administering the Implicit Associations Test as a means to determine what is subconsciously effecting our encounters with patients: **https://implicit.harvard.edu/implicit/index.jsp**

SEE THE ARTICLE CABINET ON THE S: DRIVE, "COVID-19 ARTICLE RESOURCE CABINET" FOR CHILDREN'S FULL COLLECTION