Pediatric Intensive Care-COVID-19 International Collaborative Conference Webinar: Key Takeaways

On May 2, 2020, the AHA Council on Lifelong Congenital Heart Disease and Heart Health in the Young (Young Hearts Council) participated in a 70-minute webinar presented by the **Pediatric Intensive Care-COVID-19 International Collaborative** and hosted by Boston Children's Hospital. This 70 minute event included presentations by a panel of internationally recognized experts in pediatric intensive care, pediatric cardiology, pediatric rheumatology, pediatric infectious disease, and Kawasaki disease, along with over 1800 viewers, including pediatric clinicians and researchers, as well as representatives from the WHO, NIH, CDC and European Commission.

Presenters from the AHA Young Hearts council included Ravi Thiagarajan, MD, MPH, Jane Newburger, MD, MPH, FAHA, Mary Beth Son, MD and Jane C. Burns, MD. In addition, Young Hearts Council participants included Adriana Tremoulet, MD, Vice Chair of the Rheumatic Fever, Endocarditis and Kawasaki Disease (RFEKD) Science Subcommittee, Craig Sable, MD, FAHA, RFEKD Committee member, Sarah de Ferranti, MD, MPH, FAHA, Council Chair and Anitha John, MD, PhD, FAHA, Co-Chair of the ACHD Science Subcommittee and . The key takeaways from this webinar are listed below.

<u>The panel concluded the following:</u>

1. Up to this point in the pandemic, COVID-19 infection leading to critical illness in children remains very infrequent. Most children are asymptomatic or exhibit only mild symptoms.
2. In the past two months, first in Europe, and more recently principally in cities along the East Coast of the United States, with some now also reported in the Midwest and South, a small number of children have developed a more serious inflammatory syndrome in temporal association with COVID-19 in the community, often leading to hospitalization, and occasionally requiring intensive care.
3. In order to promote immediate awareness and begin world-wide research collaboration on this disorder, we recommend that clinicians caring for children throughout the world, including pediatricians and experts in pediatric intensive care, cardiology, infectious disease, immunology and rheumatology, adopt the case definition put forth by the Royal College of Paediatrics and Child Health[1]: https://www.rcpch.ac.uk/sites/default/files/2020-05/COVID-19-Paediatric-multisystem-%20inflammatory%20syndrome-20200501.pdf
4. Children with SARS-CoV2- associated pediatric multisystem inflammatory syndrome have persistent fever, inflammation, evidence of poor function in a single organ or many organs, and other specific clinical and laboratory features, in the absence of other known infections. Some these children have part or all of the features seen in Kawasaki disease and some have clinical and laboratory signs of cytokine storm syndrome. The polymerase chain reaction (PCR) test and antibody test for SARS-CoV-2 may be positive or negative.

5. Children with this syndrome benefit from care by a multi-disciplinary team of specialists, including those with expertise in intensive care, cardiology, rheumatology, immunology and infectious diseases.
6. Clinicians caring for children exhibiting features consistent with this case definition are urged to measure sequential inflammatory markers, which includes: complete blood count/differential, CRP & ESR, coagulation studies with D dimer, Ferritin, liver function tests, and cytokine panel. In addition to PCR tests for SARS-CoV-2, antibody tests should be undertaken. Many of the children are antibody positive even when PCR negative.
7. Serial echocardiography including detailed assessment of the coronary arteries should be performed because many children with this syndrome have low heart function and some have enlargement of the coronary arteries.
8. Because some children become sicker rapidly, children should be cared for in hospitals with availability of tertiary pediatric/cardiac intensive care units.
9. It is urgent for children to be enrolled wherever possible in research protocols that include obtaining serum or plasma samples, DNA, and RNA studies for biobanking.
10. We recommend that government and NGO health agencies immediately invest in efforts to promote clinical trials, and data integration across existing and planned registries, of children ill from COVID-19 or with the inflammatory disease described here, including multi-discipline and multi-national collaboration, utilizing unique patient identifiers to avoid duplicate reporting of cases.
11. Reports from many pediatric centers indicate that in addition to the severely ill children meeting the above definition, there are increased numbers of children with fever and evidence of inflammation who are not severely ill. Some of these children may progress to more severe illness, while others appear to recover without treatment. Therefore, all children with unexplained fever and elevated CRP or white count, should be carefully followed to detect progression. Further research is needed on the full spectrum of Inflammatory disorders which appear to be related to COVID19.

Footnote 1---Case definition:

1. A child presenting with persistent fever, inflammation (neutrophilia, elevated CRP and lymphopaenia) and evidence of single or multi-organ dysfunction (shock, cardiac, respiratory, renal, gastrointestinal or neurological disorder) with additional features. This may include children fulfilling full or partial criteria for Kawasaki disease.
2. Exclusion of any other microbial cause, including bacterial sepsis, staphylococcal or streptococcal shock syndromes, infections associated with myocarditis such as enterovirus (waiting for results of these investigations should not delay seeking expert advice).
3. SARS-CoV-2 PCR testing may be positive or negative

All stable children should be discussed as soon as possible with specialist services to ensure prompt treatment (paediatric infectious disease / cardiology / rheumatology*). There should be a low threshold for referral to Paediatric Intensive Care using normal pathways.