Multisystem Inflammatory Syndrome (MIS)

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Multisystem Inflammatory Syndrome in Children (MIS-C)

- April 2020 – Severe inflammatory syndrome first recognized in the UK, occurring in children with current or recent infection with SARS-CoV-2. (Has also been called Pediatric Inflammatory Multisystem Syndrome.)
- May 2020 – Cases reported in New York City and New York State.
- May 14 – CDC released a Health Advisory to alert clinicians to MIS in children and recommended that healthcare providers report patients <21 years old meeting the case definition.
- Currently CDC has had over 700 confirmed cases of MIS-C reported to the national surveillance system.

https://www.cdc.gov/mis-c/cases/index.html

Current MIS-C US Case Definition

- Person <21 years presenting with fever,* laboratory evidence of inflammation,** and evidence of clinically severe illness requiring hospitalization, with multisystem (≥2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological); AND
- No alternative plausible diagnoses; AND
- Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or exposure to a suspected or confirmed Covid-19 case within the 4 weeks prior to the onset of symptoms.

*Fever ≥38.0°C for ≥24 hours, or report of subjective fever lasting ≥24 hours
**Including, but not limited to, one or more of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase (LDH), or interleukin 6 (IL-6), elevated neutrophils, reduced lymphocytes and low albumin

Multisystem Inflammatory Syndrome in Adults (MIS-A)

- Now there are emerging reports of a similar syndrome observed among adults. Sources include:
  - Anecdotal reports to CDC via clinical inquiries, conversations with state and local HD partners, clinicians within CDC
  - Case reports in peer reviewed literature
- Reports of patients many with a recent history of COVID-19 presenting with features of multisystem dysfunction in the setting of elevated inflammatory markers and positive SARS-CoV-2 serology

Potential Associated Complications with MIS

- Viral pericarditis
- Viral cardiomyopathy
- Cardiac arrhythmia
- Conduction disorder
- Coronary artery aneurysms
- Acute myocarditis
- Other viral pneumonia
- Acute respiratory distress syndrome
- Acute abdomen
- Acute hepatic failure
- Severe sepsis
- Acute kidney failure
- Encephalitis
- Thrombosis
- Chilblains (pernio)
- Macrophage activation syndrome
- Neurocognitive disorder

Why a Code for MIS?

- Given that this is a new condition, the true burden is unknown.
- It is possible that cases may have been misdiagnosed or misclassified as other syndromes that share some clinical features (e.g., Kawasaki Disease, sepsis, or toxic shock syndrome).
- Surveillance for MIS is important for a number of reasons, including:
  1) To define the burden of severe SARS-CoV-2 infection, including this post-infectious inflammatory phase.
  2) To avoid overlap with coding for acute Covid-19.
  3) To assess potential demand for therapeutics for MIS.
  4) To monitor MIS as both an adverse event and potential vaccine effectiveness outcome once a SARS-CoV-2 vaccine has been developed.

Why a Code for MIS?

- Interim coding algorithms have been developed that advise on how MIS should be coded, but these are not sufficiently specific for MIS.
- We are in favor of accelerated implementation of a specific MIS ICD-10-CM diagnosis code at the earliest date possible, as was done for vaping and Covid-19 codes in the past.
  - To ensure ongoing surveillance during the pandemic.
  - To enable surveillance before and after vaccines are introduced to the market to be able to assess safety of vaccination.

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