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## Eight Cases of Multisystem Inflammatory Syndrome in Children (MIS-C) — Alaska, 2020

### Background

As the pandemic of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) progresses, health consequences beyond acute coronavirus disease 2019 (COVID-19) have emerged.<sup>1</sup> One such consequence is multisystem inflammatory syndrome in children (MIS-C), a condition similar to Kawasaki disease and toxic shock syndrome.<sup>1</sup> Evidence suggests the relationship between MIS-C and SARS-CoV-2 infection involves post-infectious immune dysregulation.<sup>1</sup> Scientists have hypothesized that the cause of this dysfunction is a post-viral hyperimmune response.<sup>2</sup> Most patients who have MIS-C recover with supported medical care.<sup>3</sup> As of March 1, 2021, there have been 2,617 MIS-C cases and 33 MIS-C deaths in the United States.<sup>4</sup> This *Bulletin* summarizes MIS-C cases reported to the Alaska Section of Epidemiology (SOE) in 2020.

### Methods

We reviewed all suspected cases of MIS-C that were reported to SOE by Alaska clinicians from November 1 through December 31, 2020. Medical records were reviewed to determine if the reported cases met the case definition for MIS-C (Box). We characterized clinical and demographic characteristics of cases.

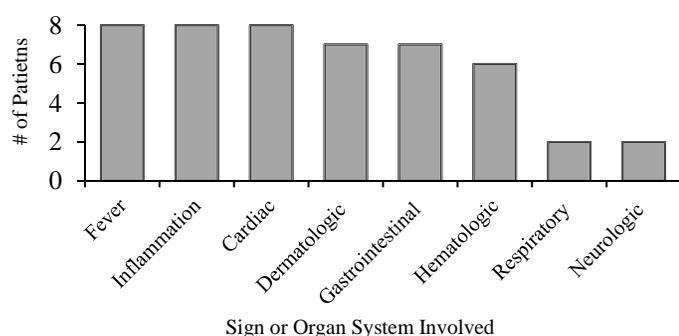
### Box. Case Definition for MIS-C<sup>3</sup>

- An individual aged <21 years presenting with fever,\* laboratory evidence of inflammation,\*\* and evidence of clinically severe illness requiring hospitalization, with multisystem ( $\geq 2$ ) organ involvement (i.e., 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  $\geq 38.0^{\circ}\text{C}$  or  $100.4^{\circ}\text{F}$  for  $\geq 24$  hours, or report of subjective fever lasting  $\geq 24$  hours  
\*\*Including but not limited to at least one of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate, fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase, or interleukin 6, elevated neutrophils, reduced lymphocytes, and low albumin

### Results

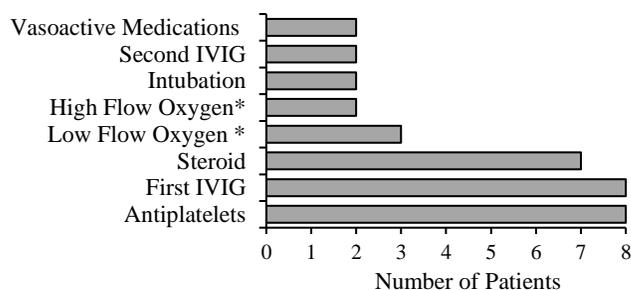
After careful review of reported cases, SOE determined that eight children met the MIS-C case definition; three were Alaska Native, three were White, one was black, and one was Native Hawaiian/Pacific Islander; one was Hispanic. Five were female. Four were aged 0–4 years, three aged 5–10 years, and one aged 11–20 years. Geographically, patients were either from Anchorage or the Mat-Su Region. Some patients were seen at a local hospital before being transferred to the Alaska Native Medical Center or Providence Alaska Medical Center. Figures 1 and 2 show clinical characteristics and treatment data.

**Figure 1. Clinical Characteristics of Eight Patients Diagnosed with MIS-C in Alaska — November 1 through December 31, 2020**



Five of the children had a positive PCR and/or a positive serology for SARS-CoV-2, and one had a positive antigen test for SARS-CoV-2. Six patients were exposed to someone with COVID-19 within 4 weeks of being diagnosed with MIS-C. No patients reported a pre-existing condition. All patients were admitted to the hospital and five were admitted to a pediatric intensive care unit due to severe complications, such as cardiac dysfunction, shock, coronary artery dilation, or aneurysm. All patients received at least one round of intravenous immunoglobulin (IVIG) and seven received steroids (Figure 2). All eight children survived.

**Figure 2. Treatments Received by Eight Patients Diagnosed with MIS-C in Alaska — November 1 through December 31, 2020**



IVIG = Intravenous immunoglobulin \*Oxygen delivered by nasal cannula

### Discussion

This report summarizes the first eight reported cases of MIS-C diagnosed in Alaska. Patients with MIS-C typically present with persistent fever, abdominal pain, vomiting, diarrhea, skin rash, and mucocutaneous lesions – sometimes starting weeks after infection with SARS-CoV-2.<sup>3</sup> They have elevated markers of inflammation (e.g., CRP, ferritin).<sup>3</sup> Some patients also develop myocarditis, cardiac dysfunction, and acute kidney injury.<sup>3</sup> Distinguishing patients with MIS-C from early acute COVID-19 and other hyper-inflammatory conditions can be challenging because of its nonspecific presentation. Treatment consists of supportive care and directed management of the underlying inflammatory process.<sup>3</sup>

### Recommendations

1. Consider MIS-C in patients with a fever  $\geq 24$  hours and who appear ill or have at least one additional organ system involved. MIS-C should also be considered in patients with an unexplained fever  $\geq 24$  hours who have a known exposure to SARS-CoV-2 within the previous 4 weeks.
2. Consider MIS-C in any pediatric death with evidence of SARS-CoV-2 infection.
3. Testing aimed at identifying laboratory evidence of inflammation and SARS-CoV-2 detection by RT-PCR or antigen test is warranted.<sup>3</sup>
4. Patients should have an outpatient pediatric cardiology follow-up 2–3 weeks after discharge.<sup>5</sup>
5. Refer to the American College of Rheumatology [clinical guidance](#) for MIS-C.<sup>3</sup>
6. Healthcare providers should contact SOE (907-269-8000) to report suspected or confirmed cases of MIS-C.

### References

1. Nakra NA, et al. (2020). MIS-C Following SARS-CoV-2 Infection: Review of Clinical Presentation, Hypothetical Pathogenesis, and Proposed Management. *Children* (Basel), 7(7). doi:10.3390/children7070069
2. Schwartz M. MIS-C: post-infectious syndrome or persistent infection? *Lancet Infect Dis* 2020 Oct 5:S1473-3099(20)30786-6. doi: 10.1016/S1473-3099(20)30786-6. Epub ahead of print. PMID: 33031752
3. CDC. Information for Healthcare Providers about MIS-C. Available at: [Healthcare Provider Information](#)
4. CDC. Health Department-Reported Cases of MIS-C in the United States. Available at: [Reported Cases](#)
5. "MIS-C Interim Guidance". Services. American Academy of Pediatrics. Org. 2021. Available at: [AAP MIS-C Guidance](#)