



TYPICAL PRESENTATION AND MODES OF TRANSMISSION

GENERAL

Less severe than adults; less likely to present with fever, shortness of breath or cough than adults

Often have viral co-infections (in up to two-thirds of cases); More upper respiratory tract involvement than lower. Mainly mycoplasma and influenza
Longer incubation period from exposure to onset of symptoms for children (6.5-7.5 days) compared to adults (5.4 days)

LABS

Thrombocytosis/thrombocytopenia, lymphocytosis/lymphopenia, neutropenia, elevated ESR, elevated CRP, elevated procalcitonin, elevated CK, elevated ALT, elevated LDH, elevated D-dimers

IMAGING

Chest Xray: unilateral or bilateral infiltrates with ground glass opacities or consolidation with surrounding halo sign

Chest CT: nonspecific unilateral/bilateral lesions

MODES OF TRANSMISSION

Coughing, sneezing, rubbing eyes, close contacts, possibly fecal-oral

There is very limited data confirming vertical transmission

COMMON PRESENTING SYMPTOMS

Age ≤ 9 Years

- Fever (46%)
- Cough (37%)
- Headache (15%)
- Diarrhea (14%)
- Sore Throat (12%)
- Myalgia (10%)
- Others (≤10%): Shortness of Breath, Runny Nose, Nausea/Vomiting, Abdominal Pain, Loss of taste/smell

Age 10-19 Years

- Headache (42%)
- Cough (41%)
- Fever (35%)
- Myalgia (30%)
- Sore Throat (29%)
- Diarrhea (14%)
- Shortness of Breath (12%)
- Others (≤10%): Runny Nose, Abdominal Pain, Lost of Smell/Taste



Infants < 12 months old have feeding difficulty and isolated fever, often with minimal respiratory symptoms.

Neonatal complications: respiratory distress or pneumonia (18%), disseminated intravascular coagulation (3%), asphyxia (2%)

Uncommon presentations include a case presentation of a patient who tested positive for SARS-CoV-2 with severe thrombocytopenia and wet purpura in the setting of suspected ITP.

Mortality <0.1% in a meta-analysis of 7480 children with confirmed COVID-19 infection.



REPORTED COMORBIDITIES WITH COVID-19 INFECTION

Young children (infants) more susceptible to severe disease than older children in some, but not all studies

Asthma or other chronic lung disease, congenital heart disease, immunocompromised status, hematologic disease, prematurity, metabolic disease.



MULTISYSTEM INFLAMMATORY SYNDROME

CDC's definition and diagnostic criteria for Multisystem Inflammatory Syndrome:

An individual under 21 years presenting with fever (at least 38°C for at least 24 hours or a subjective fever lasting 24 hours), laboratory evidence of inflammation (including but not limited to an elevated CRP, ESR, fibrinogen, procalcitonin, D-dimer, ferritin, LDH, IL-6, and neutrophils; reduced lymphocytes; and low albumin) and evidence of clinically severe illness requiring hospitalization with multisystem (≥2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological)

Demographics

As of October 1st, 2020: 1,027 cases, more than 70% were Hispanic or Latino adolescents and Black, Non-Hispanics adolescents. A little more than half (56%) were males. These populations are also disproportionately affected by COVID-19 overall.

Similar Clinical Presentation

There are clinical similarities with Kawasaki Disease (KD), including fever, rash, dilation of conjunctival blood vessels. No diagnostic test for either condition. Incidence currently unknown, but thought to be rare.

Treatment

Currently, no studies have compared different treatment options. Treatment of multisystem inflammatory syndrome primarily consists of supportive care:

- fluid resuscitation
- inotropic support
- respiratory support
- rarely, Extracorporeal membranous oxygenation (ECMO)

Testing

Cardiac, renal, and hepatic function should be evaluated via laboratory studies in patients with suspected MIS-C. A general testing outline involves:

- Lab testing (CBC, CRP, liver function, urinalysis, cytokine panel)
- Testing for SARS-CoV-2
- Testing for other pathogens (blood, urine, throat, stool cultures- in more moderate to severe cases)
- Cardiac testing- echocardiography

Common Presentation in Cohort Studies:

Phase 1:

MOST COMMON SYMPTOMS: high fever, diarrhea, abdominal pain, elevated CRP and procalcitonin, lymphopenia

OTHER SYMPTOMS INCLUDE: acute kidney injury, neurocognitive symptoms

Phase 2:

Fever persists with additional mucocutaneous involvement (conjunctivitis, fissured lips, acral rash), thrombocytopenia, decreased C3 and C4, hepatosplenomegaly, capillary leak syndrome, severely decreased albuminemia, diffuse edema

Phase 3:

Myocarditis, vasoplegic shock refractory to volume resuscitation

- Less likely to present with respiratory involvement, but most required mechanical ventilation for cardiovascular stabilization
- Small pleural pericardial and ascitic effusions suggestive of diffuse inflammatory process
- Some met criteria for Kawasaki Disease Shock Syndrome due to hypotension and clinical signs of hypoperfusion

Labs: neutrophilia, lymphopenia, thrombocytopenia, hyponatremia, slight increase in transaminases, high fibrinogen, high D-dimer, elevated proBNP, elevated CRP, elevated ferritin, elevated LDH