ISSN: 2278-4632
Vol-13, Issue-4, No.01, April : 2023

MULTI-SYSTEM INFLAMMATORY SYNDROME IN CHILDREN *(MIS-C) AND COVID-19*

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Abstract

MIS-C is a rare yet dangerous complication of the SARS-CoV-2, the virus responsible for COVID-19. Inflammation in many organs and systems, such as the heart, lungs, kidneys, skin, eyes, or gastrointestinal tract, characterizes MIS-C in young children, adolescents, and adults. Many children with MIS-C had the COVID-19 virus themselves or had been exposed to someone who was infected. Although MIS-C can be fatal, the majority of children who have been identified with it have improved after receiving treatment. The etiology and risk factors of MIS-C are poorly understood. Scientists and researchers at Children's Hospital of Philadelphia (CHOP) are working hard to learn more about the possible causes of MIS-C. Symptoms affecting the skin and mucous membranes include rashes, red eyes, swollen or red hands and feet, inflamed mucous membranes in the mouth, cracked lips, and a tongue that looks like a strawberry, Skin that is chilly and clammy; trouble breathing; excessive shortness of breath with effort; dizziness or lightheadedness; and a very fast heart rate or irregular pulse are all examples. The prevention of MIS-C are as follows Wash hands frequently, Keep distance from anyone who appears to be sick, Keep some distance from other people, Masks made of cloth should be worn in public, Try not to contaminate nose, eyes, and mouth with your hands, Cover your lips with a tissue or elbow if you need to sneeze or cough, Frequent disinfection and cleaning of frequently touched areas, Wash clothes and other items as needed.

Key Words: Multi – system inflammatory syndrome (MIS - C), Multi-system inflammatory syndrome in adults (MIS-A), COVID -19, SARS-CoV-2

Introduction

MIS-C is a rare yet dangerous complication of the SARS-CoV-2, the virus responsible for COVID-19. Inflammation in many organs and systems, such as the heart, lungs, kidneys, skin, eyes, or gastrointestinal tract, characterizes MIS-C in young children, adolescents, and adults. Many children with MIS-C had the COVID-19 virus themselves or had been exposed to someone who was infected. Although MIS-C can be fatal, the majority of children who have been identified with it have improved after receiving treatment. Because its etiology and risk factors are poorly understood, MIS-C is classified as a syndrome (a collection of symptoms rather than a disease). It's possible that identifying and analyzing more kids with MIS-C will lead to the discovery of its cause. The National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC) in the United States are collaborating with medical professionals and academics from across the country to increase our understanding of MIS-C risk factors, disseminate relevant data, and enhance MIS-C diagnosis and treatment. Adults are not immune to developing MIS-C-like symptoms on extremely rare occasions. Adults who have been infected with the COVID-19 virus before may develop a new and potentially fatal condition called multi-system inflammatory syndrome in adults (MIS-A). However, some people may be infected with COVID-19 at the time they develop MIS-A. To confirm present or prior infection with the virus, a diagnostic or antibody test for COVID-19 can be helpful if MIS-A is suspected.

Meaning

The symptoms of SARS-CoV-2 infection, which causes multi-system inflammatory syndrome in children (MIS-C), are similar to those of toxic shock syndrome and Kawasaki illness. Dengue fever can mimic MIS-C in its more severe manifestations, with a high temperature, an erythematous rash,

ISSN: 2278-4632
Vol-13, Issue-4, No.01, April : 2023

vomiting, abdominal pain, and eventually shock. Finding the correct diagnosis and administering the appropriate treatment are critical in reducing mortality rates associated with either of these conditions.

Causes

Antibodies against SARS-CoV2, the causative agent of COVID-19, have been found in nearly all infants with multi-system inflammatory syndrome. Most children with COVID-19 have mild symptoms and don't need intensive medical treatment. It appears that COVID-19 causes MIS-C, or a systemic inflammatory reaction in a small percentage of newborns, due to an overactive immune response. In most cases, MIS-C symptoms appear four weeks after the initial infection with COVID-19, although they might appear as early as three weeks or as late as six weeks after infection. Scientists and researchers at Children's Hospital of Philadelphia (CHOP) are working hard to learn more about the possible causes of MIS-C. There is no evidence that MIS-C can be transmitted from person to person at this time.

Risk Factors

- The most significant risk factor for developing MIS-C is infection with SARS-CoV-2, the virus that generates COVID-19.
- It is common for children with MIS-C to have had no or few COVID-19 symptoms before the onset of MIS-C symptoms, which typically occur between 2 and 6 weeks after infection.
- Most kids diagnosed with MIS-C do not have any other medical problems. Children with MIS-C have a high prevalence of obesity as an underlying medical issue.

Incidence

- SARS-CoV-2 has been linked to MIS-C in pediatric and adolescent patients.
- The most disproportionately affected racial and ethnic groups of American children and adolescents, especially non-Hispanic black and Hispanic or Latino children and adolescents, had the greatest rates of MIS-C. Try the CDC's COVID Data Tracker.
- The daily reported COVID-19 cases have followed a similar pattern to the MIS-C cases throughout the duration of the epidemic. Cases of MIS-C tend to spike about a month after COVID-19 does.

Symptoms

MIS-C may have the following characteristics:

- Symptoms affecting the skin and mucous membranes include rashes, red eyes, swollen or red hands and feet, inflamed mucous membranes in the mouth, cracked lips, and a tongue that looks like a strawberry.
- Skin that is chilly and clammy; trouble breathing; excessive shortness of breath with effort; dizziness or lightheadedness; and a very fast heart rate or irregular pulse are all examples.
- Diarrhoea, nausea, and vomiting are all signs that something is wrong in the digestive system.
- Respiratory symptoms include coughing and shortness of breath.
- Headaches, neck pain, mental disorientation, sensory changes (such as numbness or tingling in the extremities), and seizures are all examples of new neurological symptoms.

Warning Indications of MIS-C Emergencies

- Distressing abdominal discomfort
- Lack of air, difficulty breathing
- Bluish or silvery skin, lips, or fingernails
- Recent Confusion

ISSN: 2278-4632
Vol-13, Issue-4, No.01, April : 2023

- Having trouble waking up or staying awake?

Complications

Numerous experts view MIS-C as a complication of COVID-19. MIS-C can cause significant difficulties with essential organs such as the heart, lungs, and kidneys if it is not diagnosed early and managed and treated appropriately. In rare instances, MIS-C may cause irreversible harm or death.

Diagnosis

At present time, MIS-C is diagnosed through observation of symptoms (such as persistent fever and dysfunction of one or more organs, such as the heart or gastrointestinal system) and through laboratory testing that looks for evidence of inflammation within the body. Furthermore, a positive result on the COVID-19 test for children is required. Moreover, tests are conducted to rule out other probable causes of the symptoms, such as different infections. Once a kid has been diagnosed with MIS-C, more testing is necessary to evaluate inflammation, blood clotting, liver function, and cardiac function. Cardiac MRI, Holter monitors, and activity testing are all useful tools for assessing heart and coronary artery health in children, and should be performed alongside echocardiograms. Some children with heart conditions may need more tests, like a cardiac MRI or a Holter monitor.

Management

Today, the World Health Organization announced updated guidelines for the therapy of COVID-19-associated multisystem inflammatory syndrome in children (MIS-C). MIS-C is a rare but deadly illness in which children infected with COVID-19 develop organ-specific inflammation. Children with this syndrome require special care and may require critical care admission. Although MIS-C is a dangerous illness, children with it can recover with the proper medical care. In addition to supportive therapy and care, the new WHO guidelines advocate the use of corticosteroids in hospitalised children (0–18 years) with this illness. This advice is based on the availability of data from three observational studies, including a total of 885 patients. In May of 2020, the WHO first described this illness and presented a preliminary clinical description. They continue to have a minimal risk of acquiring severe or life-threatening COVID-19 but, similar to adults, some underlying factors make children more susceptible to severe disease. Most of the time, these conditions are called obesity, chronic lung disease (like asthma), heart disease, and lowered immunity.

Prevention

- **Wash your hands frequently.** Always use soap and water to thoroughly wash your hands for at least 20 seconds between each use. If you need to wash your hands but don't have access to soap and water, a hand sanitizer with at least 60% alcohol can do the trick.
- **Keep your distance from anyone who appears to be sick.** In particular, avoid being around those who are exhibiting contagious symptoms such as coughing or sneezing.
- **Keep some distance from other people.** That's why it's important to keep your distance from other people when you're out and about with your kid, preferably at least 6 feet away (2 meters).
- **Masks made of cloth should be worn in public.** If you and your kid are going to be in a public place, inside or outdoors, where there is a high risk of COVID-19 transmission, like a crowded event or large gathering, wear a face mask that protects the nose and mouth. When it comes to mask use, more specific instructions are provided based on whether or not you have had a full vaccination.
- **Try not to contaminate your nose, eyes, and mouth with your hands.** You should set a good example by not touching your child's face, and tell him to do the same.
- **Cover your lips with a tissue or your elbow if you need to sneeze or cough.** You and your children should get into the habit of covering your mouths when you sneeze or cough to avoid spreading viruses.

ISSN: 2278-4632
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- **Frequent disinfection and cleaning of frequently touched areas.** Everything from the switches on the doors and lights to the handles on the remote controls and furniture to the keys on the keyboard to the faucets and flush valves in the bathrooms and even the toilets themselves may be touched.
- **Wash clothes and other items as needed.** If you want your clothes clean, do what the manual says and use the hottest water setting on your washing machine. Keep washable stuffed animals in mind.

Conclusion

MIS-C is a rare but deadly illness in which children infected with COVID-19 develop organ-specific inflammation. Children with this syndrome require special care and may require critical care admission. In most cases, MIS-C symptoms appear four weeks after the initial infection with COVID-19, although they might appear as early as three weeks or as late as six weeks after infection. Scientists and researchers at Children's Hospital of Philadelphia (CHOP) are working hard to learn more about the possible causes of MIS-C. There is no evidence that MIS-C can be transmitted from person to person at this time. The prevention of MIS-C are as follows Wash hands frequently, Keep distance from anyone who appears to be sick, Keep some distance from other people, Masks made of cloth should be worn in public, Try not to contaminate nose, eyes, and mouth with your hands, Cover your lips with a tissue or elbow if you need to sneeze or cough, Frequent disinfection and cleaning of frequently touched areas.

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