Case study

MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN WITH COVID-19

Abstract:

Multisystem inflammatory syndrome in children is caused by the SARS-CoV-2. MISC varies from Mild to Severe. Most of the children do not exhibit appropriate symptoms.MISC effects respiratory system, Gastrointestinal system, and cardiocirculatory system. In this case report a female child of 10years was diagnosed with MISC. Her CBP varied from day to day with pancytopenia. The childs IgM was positive for Covid 19. The child experienced the symptoms of fever, seizures and syncope. She was treated with Antibiotics and symptomatic treatment.

Key Words:

SARS-CoV-2, Multi inflammatory syndrome in children,IgM.

Introduction:

SARS-CoV-2, also known as the severe acute respiratory syndrome coronavirus, is still spreading quickly among human populations and can cause everything from asymptomatic carrier status to multi-organ failure and death. (1) Children make up about 1% of hospital admissions, and acute coronavirus illness (COVID-19) appears mild in comparison to adult cases. (2,3) A rare disease connected to SARS-CoV-2 is known as the multisystem inflammatory syndrome in children (MIS-C).

The first report of Multisystem inflammatory disease(MIS-C) in children was reported in April 2020. (4) no one test or symptom may be used to diagnose MIS-C; rather, the definitions comprise several symptoms, laboratory findings, and radiological findings. (5) The majority of kids with MIS-C report no prior illness and were generally healthy. (6) Medical research reveals that MIS-C shares many symptoms with Kawasaki's disease but differs in several ways, including more extreme inflammation. (7)

The severity of the illness varies, and the symptoms of MIS-C often present 2–6 weeks following infection with COVID-19. (8) Children with MIS-C exhibit fever (99.4%), digestive (85.6%), cardiocirculatory (79.3%), and gastrointestinal problems, as well as elevated inflammatory biomarkers. However, respiratory symptoms are also present in 50.3% of cases. More than half of patients experience shock and multiorgan damage; in critically unwell children, cytokine storm is prevalent and necessitates therapy and preparation for intensive care. Although many children (73.3%) with COVID-19 respiratory disease require urgent care, mortality is quite low (1.9% compared to adults and the elderly). (5)

Case Presentation:

A Female child 10 years old was admitted to the department of pediatrics with the chief complaints of fever for 15 days, vomiting, convulsions, altered sensorium for 1 day, paleness, and easy fatiguability for 4-5 days. The convulsions were in the form of tonic-clonic of the left side associated with frothing from the mouth and involuntary passage of urine, each episode lasting for 5-10 minutes. Altered sensorium was insidious in onset and progressive from drowsiness to coma. She had a history of 2 attacks of syncope after voiding the urine.

On laboratory investigation, it was found to be an Intracranial bleed secondary to meningitis. On day 1 the WBC levels are 14000 and the Platelets are1,30,000. On Day 2 WBC is similar to Day 1 and RBC is 3.36mill/ml, Platelets were 21000. On day 3 RBC was found to be similar to day 1, WBC was 2600, and platelets were markedly decreased to 6000. On day 3 the child has vomiting of blood. On day 4 WBC decreased to 2200 and Platelets increased to 9000. The Covid IgM antibody was positive with a value of 1.16. The D Dimer increased to 2129. On day 5, 3 vials of IvIg were transfused. On day 5 RBC decreased to 2.25mill/ml and Platelets increased to 56000. The CBP of the child shows Pancytopenia.

From the symptoms and laboratory investigations, it was diagnosed to be Multisystem inflammatory syndrome in children with COVID-19. The Gram stain report showed few pus cells and gram-positive cocci On Bone Marrow aspiration the impression shown was hepatocellular with fatty spaces. During the hospital stay the child was treated with Inj.Ceftriaxone, Inj.Amikacin, IVF, Inj.Meropenem, Inj.Vancomycin, Inj.Sodium Valproate, IvIg.

Discussion:

Uncertainty surrounds the pathophysiology of children's progression to MISC. According to recent research, there is a hyperinflammatory reaction that resembles TSS, incomplete Kawasaki Disease (KD), and Macrophage Activation Syndrome (MAS). This suggests that the innate immune system is activated, leading to significant pro-inflammatory output. (9) Similar to the staphylococcal enterotoxin B (SEB), which is known to attach to the costimulatory protein CD28 and the T cell receptor (TCR) and mediate TSS, SARS-CoV-2 may function as a superantigen (10). A syndrome known as "cytokine storm" is caused by the activation of innate immunity during SARS-CoV-2 infection and is characterized by a persistent fever and significantly elevated levels of several cytokines, primarily TNF-, IL-1, IL-1RA, sIL-2R, IL-6, IL-10, IL-17, IL-18, IFN-, MCP-3, M-CSF, MIP-1a, G-CSF, IP-10, and M (11). The majority of recent case series of MIS-C patients documented increased IL-6 levels. (9,12,13)

In our case report child has come with multiple complaints involving the neurological system. Her laboratory investigations were also found to be abnormal. Her Covid IgIM was found to be positive. Positive IgIM and involvement of multiple organs made the diagnosis clear of COVIDinduced Multi inflammatory syndrome in children. The child was treated with Antibiotics, IvIg, and anti-epileptics.

Conclusion:

According to a prior study, MIS-C is a delayed immunological response to SARS-CoV-2. As a result, there will undoubtedly be more MIS-C situations in the future. Additionally, MIS-C frequently necessitates resuscitation owing to circulatory collapse; as a result, practitioners should be familiar with this illness.

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