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Original Research Paper

Paediatrics

MULTISYSTEM INFLAMMATORY SYNDROME IN A CHILD WITH DENGUE CO-INFECTION: A RARE CASE WITH A RARER PRESENTATION

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ABSTRACT Patient's confidentiality maintained, written valid consent was taken from parents and guardian

KEYWORDS : Dengue, Multi-system Inflammatory syndrome- Children (MIS-C), Co-infection

Manuscript

As the COVID 19 pandemic evolved, there were case reports of children with unusual febrile illnesses that have features similar to: Kawasaki's disease & Toxic Shock Syndrome such as Myocarditis with myocardial dysfunction, coronary artery dilatation/aneurysm, acute abdomen & encephalopathy. Features of Macrophage Activation Syndrome such as elevated inflammatory and fever with multi-system involvement due to antibody enhancement tissue injury & cytokine storm. Similar cases were seen with varied presentations and this spectrum was given a broad term of Multi-system Inflammatory Syndrome in Children(MIS-C).

Hereby I am presenting an interesting case of MIS-C with dengue that had reported to our hospital. The child had complaints of fever with rash for 4 days and was treated as a dengue in an outside setup. Child was then referred to our tertiary care center with complaints of rash and fever and increased O2 requirement. The child was admitted in our hospital and keeping in mind the ongoing pandemic the child was made to undergo a RT-PCR testing which came to be negative. Childs covid antibody was sent which came to be positive and child was then worked up for MIS-C. The child was treated for MIS-C and after treatement, the child was discharged on room air with no residual infection manifestation.

MIS-C is a clinical condition as a result of delayed immune reaction 2 to 4 weeks post Covid-19 infection and has varied severity of presentations. Hence, It's of utmost importance during the ongoing pandemic to have a better understanding of the spectrum of MIS-C to aid in high index suspicion, diagnosis and line of management for children suffering from MIS-C.

7 Year old male child reported to hospital with complaints of fever since 4 days, rash on hands and increased work of breathing since 1 day.

Patient was completely alright 4 days back when he developed fever was insidious in onset, mild to begin with which increased over 4 days. Child was taken to a local doctor and few investigations were done on outpatient basis which came positive for Dengue NS1 antigen.

Child on the 4th day of illness started experiencing breathlessness on rest and hence was got to hospital. There was history of reduced urine output since 12 hours. Patient had no history of cough, cold, loss of taste/smell. There was also no history of recurrent respiratory tract infection, cyanosis or dyspnoea on exertion prior to the illness. There was no history of hemoptysis, loss of weight or evening rise of temperature. There was No history of recurrent nebulisations in the past.

On Examination; well nourished was Febrile (101f) **with** Pulse Rate of 122 beats per min **and** Respiratory Rate of 40 per min**. His** SPO2 on room air was 86%. No pallor, cyanosis, clubbing, oedema, and lymphadenopathy detected on examination. Peripheral pulses were well felt, but Facial flushing was present with **Blood** pressure of 90/62 mm hg (< 50th %le for age)

On local examination, blanching present on the skin with Urticarial wheals present on extensor surfaces of palm which were non-itchy.

Systemic Examination-

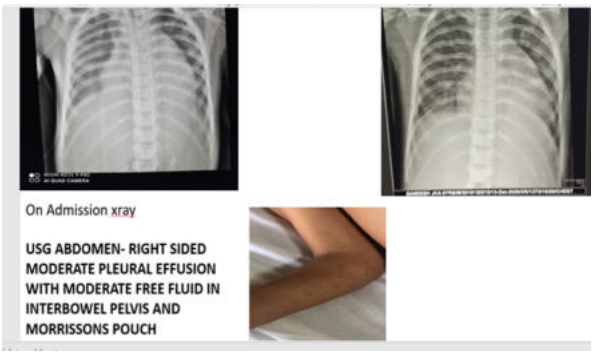
Per-abdomen showed a distended abdomen with a liver of 6cm below the costal margin, liver span=14cm and no splenomegaly

Cvs- S1S2+ and no murmur heard
RS- AEBE, no adventitious breath sounds,
CNS- conscious, alert with GCS of 15/15

Child was admitted as there was fall in spo2 and child had breathlessness. Child was put on O2 support and since BP and urine output was on the lower side and as the outside report showed a positive Dengue NS1, child was catheterized started on 20% extra IV fluids, routine investigations were sent and child's BP and Urine output was closely monitored. As the BP was constantly on the lower side (<50 %le) child was started on Inj. Nor-Adrenaline. As the breathlessness and tachycardia was still persistent despite achievement of adequate urine output and increase in BP and keeping in mind the ongoing COVID pandemic and post COVID MIS-C syndrome as the child was fitting in the WHO definition of MIS-C, COVID RT-PCR, COVID Antibodies and inflammatory markers were sent.

WHO case definition
All 6 criteria must be met:
1. Age 0 to 19 years
2. Fever for ≥3 days
3. Clinical signs of multisystem involvement (**at least 2** of the following):
• Rash, bilateral nonpurulent conjunctivitis, or mucocutaneous inflammation signs (oral, hands, or feet)
• Hypotension or shock
• Cardiac dysfunction, pericarditis, valvulitis, or coronary abnormalities (including echocardiographic findings or elevated troponin/BNP)
• Evidence of coagulopathy (prolonged PT or PTT; elevated D-dimer)
• Acute gastrointestinal symptoms (diarrhea, vomiting, or abdominal pain)
4. Elevated markers of inflammation (eg, ESR, CRP, or procalcitonin)
5. No other obvious microbial cause of inflammation, including bacterial sepsis and staphylococcal/streptococcal toxic shock syndromes
6. Evidence of SARS-CoV-2 infection

Investigation



The investigations showed a clear picture of MIS-C with a positive COVID antibody & raised inflammatory markers.

As the D-Dimer levels were high child was started on low dose aspirin and DVT prophylaxis was given.

	DAY 1	DAY 5
HB	8.6	9.1
TLC	13,500	6080
PLT	93,000	4,62,000
PCV	25.5	26.6
CRP	331.5	94.6
PRO-BNP-	>35,000	1909
COVID ANTIBODY	POSITIVE (24.6)	
RT-PCR COVID-19	Negative	
D-Dimer	1.92	
Ldh	269	239
Trop-T	198.3	33.4
ESR	120	
Dengue IgM	Positive (13.6)	

The Pro-BNP was high suggesting of a myocardial injury, xray cchest showed a cardiomegaly and there was a baseline tachycardia hence child was started on pulse dose of Inj. Methylprednisolone @ 30 mg/kg/dose for 5 days.

Childs RT-PCR for COVID 19 came negative hence child was shifted to PICU. Child was continued on Inj. methylprednisolon for 5 days and investigations were repeated on day 5 of steroid which showed all inflammatory markers coming to baseline.

Child was symptomatically better post Inj. methylprednisolone and was discharged after 10 days on low dose aspirin and oral prednisolone.

DISCUSSION

The above case showed a rare combination of MIS-C and dengue co-infection.

Above patient responded wonderfully to aspirin and methylprednisolone and a very high level of suspicion is required during the pandemic for the diagnosis of MIS-C.

Inflammatory markers are the main stay investigations for the diagnosis and should be sent at the earliest to start the appropriate treatment thus preventing further deterioration.

COVID MIS-C is a clinical condition as a result of delayed immune reaction 2 to 4 weeks post Covid-19 infection and has varied severity of presentations.

Hence, It's of utmost importance during the ongoing pandemic to have a better understanding of the spectrum of MIS-C to aid in high index suspicion, diagnosis and line of management for children suffering from MIS-C.

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