

MISA Vs SEPTIC SHOCK

Solomon K Dominic, Vasant PK, Abhishek Menon, Subash Chandra
Amrita Institute of Medical Sciences and Research Centre, Kochi, Kerala

INTRODUCTION

During the course of the coronavirus disease 2019 (COVID-19) pandemic, reports of a new multisystem inflammatory syndrome in children (MIS-C) have been increasing in Europe and the United States. Clinical features in children have varied but predominantly include shock, cardiac dysfunction, abdominal pain, and elevated inflammatory markers, including C-reactive protein (CRP), ferritin, D-dimer, and interleukin-6. Since June 2020, several case reports have described a similar syndrome in adults. Because of the temporal association between MIS-A and SARS-CoV-2 infections, interventions that prevent COVID-19 might prevent MIS-A.

CASE HISTORY

- A 31 year old male with no known comorbidities who recovered from COVID-19 infection recently (less than 2 weeks) presented with complaints of fever, loose stools, dysuria, vomiting and abdominal pain for the past 3 days.
- Fever was high grade, associated with chills. Fever was settling with Paracetamol
- Abdominal Pain- Epigastric region, Associated with nausea and vomiting
- Loose stools- Large volume, watery, no blood or mucus

EXAMINATION

- Vitals- PR- 104/min, BP- 120/78mmHg, RR- 24/min, Spo2- 98% in room air
- Conjunctival Congestion +
- P/A- Soft, Mild tenderness in the epigastric region, Bowel sounds present, no renal angle tenderness
- Rest of the examination were within normal limits

DIAGNOSIS

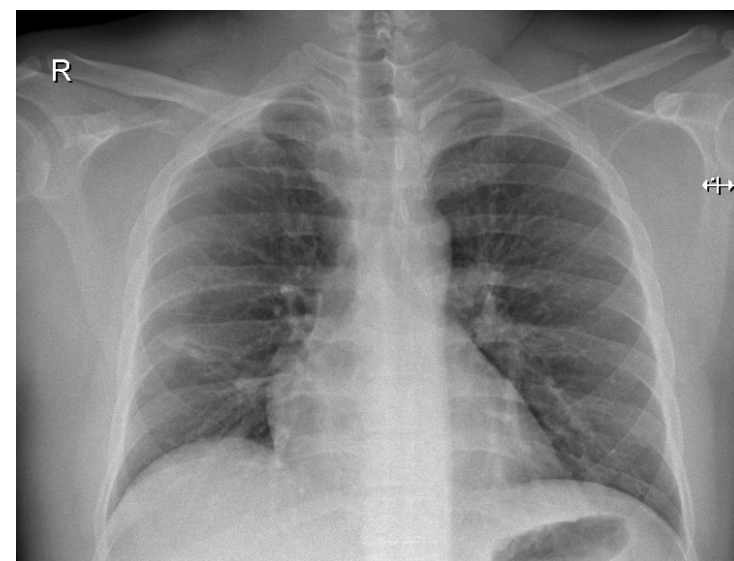
- Initial ABG showed High Anion Gap Metabolic Acidosis
- Urine Ketones were positive with elevated glucose.
- DKA was managed.

Initial labs

- Hemoglobin - 11.8
- WBC-6.11
- Neutrophils-87%
- Lymphocytes- 8%
- Platelets-61
- CRP- 342
- Procalcitonin-17
- Creatinine-0.99
- Urea- 14.7
- Na- 130
- K-3.9
- Mg- 0.9
- Ca- 8.8
- Po4- 2.4
- Total Bilirubin / Direct Bilirubin - 1.0/0.4
- SGOT-76
- SGPT-88

- SERUM KETONE- POSITIVE
- AMYLASE- 21
- LIPASE- 158
- HbA1c- 13
- TRIGLYCERIDES- 355
- TOTAL CHOLESTEROL – 90
- HDL- 8.6
- LDL- 8.8
- VLDL- 71

CHEST XRAY

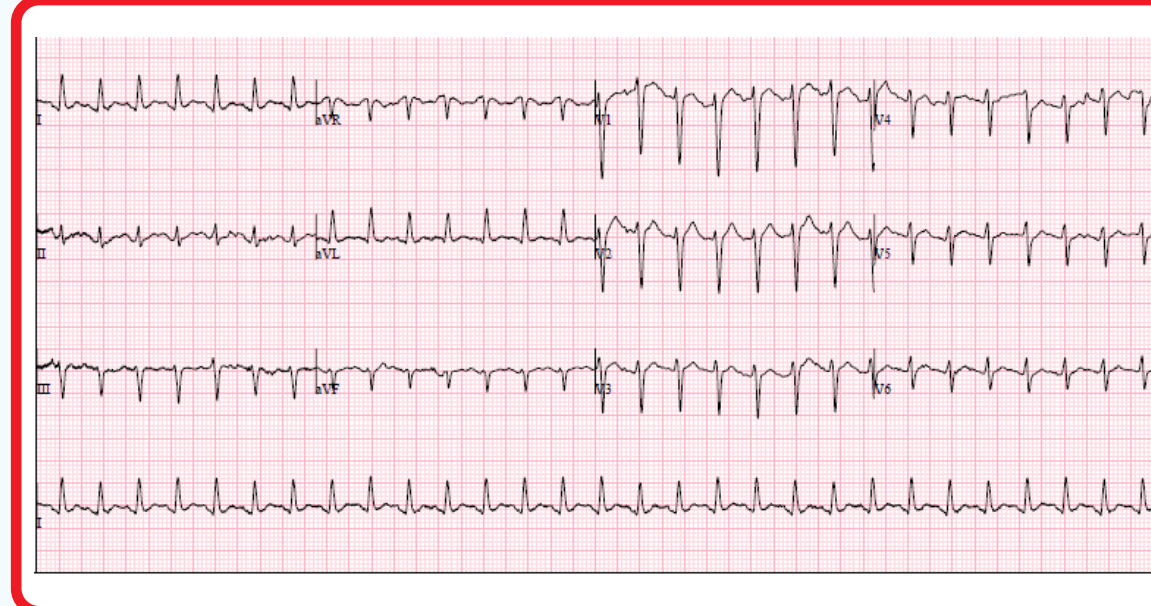


- He was managed for DKA.
- He was added with Piperacillin –Tazobactam after sending Blood and urine cultures.
- Repeat CRP and Procalcitonin was high-
- Hence antibiotics hiked upto Meropenem and Doxycycline was added.

DAY 2 SINCE ADMISSION

- Patient became tachypenic and he was having persistent Tachycardia (140).
- ECG was showing Sinus tachycardia
- In view of persistent tachypenia he was initiated on Bipap.
- He became better with Bipap and was changed to NRBM and then to room air.

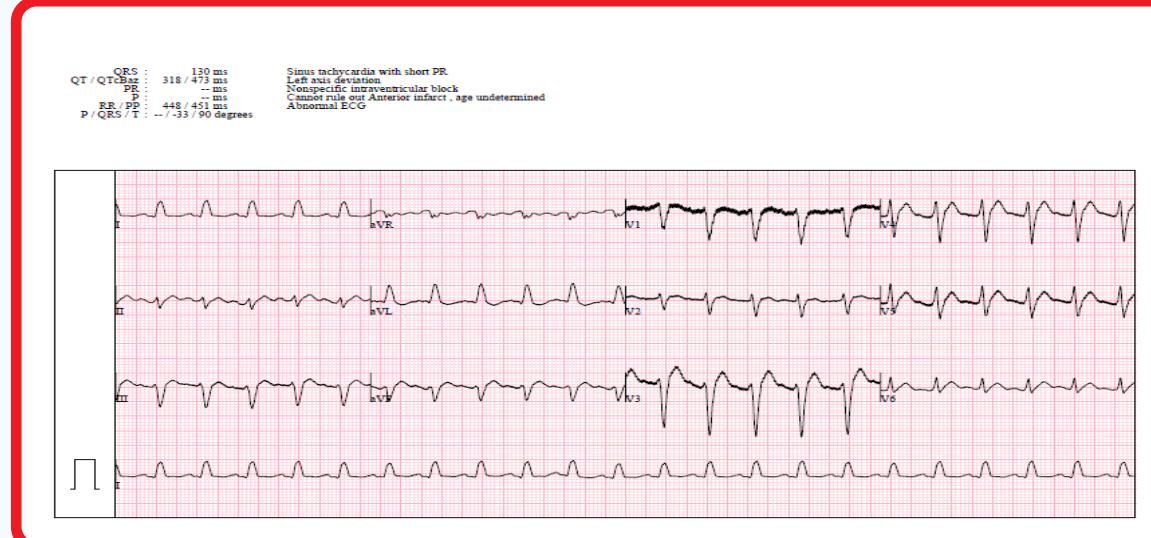
Sinus tachycardia



Day 3- Early morning

- He had developed sudden bradycardia followed by asystole
- CPR and active resuscitative measures were given for 30 minutes
- ROSC was achieved after 30 minutes.
- He had developed Ventricular tachycardia for which he was Cardiovereted using 200 Joules of DC Shock.
- Intubated and connected to mechanical ventilator- 100% FiO2
- On 3 inotropic support- Maximum

ECG



Labs POST CARDIAC ARREST

- HB- 12.7
- WBC- 14.66
- Neutrophils- 74
- Lymphocytes- 17
- Platelets-64
- CRP- 361
- Procal- 75
- Creatinine- 2.62 2.86
- Urea- 45 98
- IL-6- 90
- TROP T- 0.17
- CKMB- 5.98
- LDH- 610
- FERRITIN- 45,201
- D-DIMER- 8.20
- Na- 135
- K- 4.5
- Mg- 2.9
- T.Bili/D.Bili- 1.5/1.0
- OT- 250
- PT-130
- ALP- 104
- APTT- 45
- INR- 1.59

- Pupils- Anisocoria
- Suspected Bleed
- Poor Prognosis was explained to the bystander.
- Was started on hydrocortisone infusion.
- In view of worsening renal parameters
- Nil urine output
- Planned on SLED
- However his urine output improved with Lasix infusion

Screening echo

- Suggestive of stress cardiomyopathy
- Mild to Moderate LV dysfunction
- Basal segment seen better contacting than apex
- No clot/PE
- Blood cultures were reported as no growth.
- In view of elevated ferritin and other features fitting into CDC criteria for MISA.
- We decided to Pulse him with steroids.
- Inj. Solumedrol 500mg IV OD x 5 days

DISCUSSION

Multisystem Inflammatory Syndrome (MIS)-A Case Definition

Case Definition for MIS-A

A patient aged ≥16 years hospitalized for ≥5 days, or with an illness resulting in death, who meets the following clinical and laboratory criteria. The patient should not have a more likely alternative diagnosis for the illness (e.g., bacterial sepsis, reactivation of a chronic medical condition).

Clinical Criteria

Subjective fever or documented fever (≥38.3°C or 101.1°F) prior to hospitalization or within the first THREE days of hospitalization and at least THREE of the following clinical criteria occurring prior to hospitalization or within the first THREE days of hospitalization. At least one must be a primary clinical criterion.

- Primary clinical criteria
 - Severe cardiac illness including myocarditis, pericarditis, coronary artery dilatation/aneurysms, or new-onset (left or right) ventricular dysfunction (LVEF <50%, JVD of degree A or B, or pulmonary congestion) (Note: cardiac arrest alone does not meet this criterion)
 - Rash AND conjunctivitis/erythema
 - New-onset neurologic signs and symptoms include encephalopathy in a patient without prior cognitive impairment, seizures, meningitis signs, or peripheral neuropathy (including Guillain-Barre syndrome)
 - Shock or hypotension not attributable to medical therapy (e.g., sepsis, renal replacement therapy)
 - Abnormal liver function (ALT or AST ≥2x ULN)
 - Thrombocytopenia (platelet count <100,000/mm³)
- Laboratory evidence
 - The presence of laboratory evidence of inflammation AND SARS-CoV-2 infection
 - Elevated levels of at least TWO of the following: CRP ≥100mg/L, Ferritin ≥500 ng/mL, erythrocyte sedimentation rate (ESR) ≥50mm/hour
 - A positive SARS-CoV-2 test during the current illness by RT-PCR, serology, or antigen detection

DAY 4

- Sensorium improved
- E4VTM6
- Moving all 4 limbs
- Obeying simple commands
- CT Brain Plain was done to rule out bleed- No bleed
- Inotropes were tapered and stopped
- FiO2 was reduced
- Patient was extubated on 10/9/21
- Initially maintain oxygen with NRBM
- Later oxygen was tapered and stopped
- Renal parameters completely normalized
- Blood sugars were closely monitored and Insulin was titrated accordingly.

Repeat screening echo

- NORMAL
- No Obvious RWMA
- Good LV systolic function
- No MS/MR
- No AS/AR
- Preserved RV function
- No clot/PE

DIAGNOSIS

- MULTISYSTEM INFLAMMATORY SYNDROME- ADULT
- ABORTED CARDIAC ARREST
- STRESS CARDIOMYOPATHY
- NEWLY DETECTED DIABETES MELLITUIS
- ACUTE KIDNEY INJURY- RESOLVED
- DYSELECTROLYTEMIA

CONCLUSION

Clinicians and health departments should consider MIS-A in adults with signs and symptoms compatible with the current working MIS-A case definition. Antibody testing for SARS-CoV-2 might be needed to confirm previous COVID-19 infection in patients who do not have positive SARS-CoV-2 PCR or antigen test results. Findings in this convenience sample emphasize the importance of collecting race/ethnicity data on case reports at the jurisdictional level. As with children, it is important that multidisciplinary care be considered to ensure optimal treatment. In the process of learning more from MIS-A cases, the working case definition might need to be revised in order to systematically conduct a call for cases. Further research is needed to understand the pathogenesis and long-term effects of this newly described condition. Ultimately, the recognition of MIS-A reinforces the need for prevention efforts to limit spread of SARS-CoV-2.

REFERENCES

- Case Series of Multisystem Inflammatory Syndrome in Adults Associated with SARS-CoV-2 Infection — United Kingdom and United States, March–August 2020
- Multisystem Inflammatory Syndrome (MIS)- Case definition <https://www.cdc.gov/mis/mis-a/hcp.html>