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A CASE SERIES OF NEONATAL INFLAMMATORY SYNDROME (MIS-N) WITH RARE CLINICAL MANIFESTATIONS

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ABSTRACT

Multisystem inflammatory syndrome in neonates (MIS-N) is hypothesized to be caused either following transplacental transfer of SARS-CoV2 antibodies. MIS-N presents with a variety of clinical presentations and requires a high index of suspicion.

CASE REPORT

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INTRODUCTION

Multisystem inflammatory syndrome in neonates (MIS-N) is hypothesized to be caused either following transplacental transfer of SARS-CoV2 antibodies or antibodies developed in the neonate after infection with SARS-CoV-2. Multisystem inflammatory syndrome in neonates (MIS-N) associated with perinatal severe acute respiratory syndrome 2 (SARS – COV-2) exposure is being reported. MIS-N presents with a variety of clinical presentations and requires a high index of suspicion. (1-3) We report a series of neonates presented with different clinical manifestations in our NICU and their management.

CASE STUDY:

Case 1

A male neonate born at 39 weeks' period of gestation with birth weight of 3.2 kg. Baby cried immediately after birth. Baby developed tachypnea 06 hours post birth with Spo2 - 90-92 % at room air and respiratory rate of - 80/min with bilateral chest retractions. Managed with bubble CPAP with Fio2 – 30% and PEEP of 5 cm H2O, i.v. fluids and antibiotics. Sepsis screen was normal and Chest X ray was unremarkable. Respiratory distress persisted after 48 hours. Baby started having multiple apneic episodes with desaturation on day 3 of life. An echocardiogram revealed normal biventricular function and any structural heart disease. On reviewing the history, mother was unvaccinated for coronavirus disease 2019 (CoVID-19) and had a SARS-CoV-2 infection four weeks before delivery. The baby had high titers of Ig G antibodies 270 AU/mL with negative IgM titres for SARS-CoV-2 with raised inflammatory markers (Ferritin – 359 ng/ml, Procalcitonin – 15 ng/ml, D – dimer –

4367 ng/ml). The SARS-CoV-2 reverse transcriptase – polymerase chain reaction (RT-PCR) of the neonate was negative. Blood culture was sterile. Managed with i.v. methylprednisolone 2mg/kg/day in two divided doses for 03 days along with intravenous immunoglobulin 2g/kg stat. The baby showed dramatic improvement in clinical condition in next 06 hours with no fresh apneic episodes. Respiratory distress also settled down over next 12 hours. The baby was started on oral feeds and discharged on day 8 of life.

Diagnosis: MIS –N (Frequent apnea)

Case 2

A female neonate born at 38 weeks' period of gestation by normal vaginal delivery with birth weight of 3.0 kg. The baby was vigorous at birth and roomed in with mother. After 48 hours of breastfeeding baby developed abdominal distension and 02 episodes of vomiting. Shifted to NICU immediately. On examination baby had fever 101, lethargic, Heart rate – 180/min, Respiratory rate – 68/min, Spo2 – 90% at room air with cold peripheries and mean blood pressure of 30 mm Hg. X ray abdomen showed dilated bowel loops with features of pneumatosis intestinalis. Sepsis screen was suggestive of CRP- 75mg/dl, Total leukocyte count 24,000 with 75 % neutrophils. With possible diagnosis of necrotizing enterocolitis, baby was kept nil orally, given intravenous fluids, antibiotics, inotropes and CPAP support. On reviewing the history, mother was unvaccinated for coronavirus disease 2019 (CoVID-19) and had a SARS-CoV-2 infection five weeks before delivery. The baby had high titers of Ig G antibodies 345 AU/mL with negative IgM titres for SARS-CoV-2 with raised inflammatory markers (Ferritin – 465 ng/ml, Procalcitonin – 35 ng/ml, D – dimer – 5643 ng/ml). The SARS-CoV-2 reverse transcriptase – polymerase chain reaction (RT-PCR) of the neonate was negative. Blood culture was sterile. Managed with i.v. methylprednisolone 2mg/kg/day in two divided doses for 03 days along with intravenous immunoglobulin 2g/kg stat. The baby gradually improved in the next 48 hours with resolution of abdominal distension and decreased requirement of inotropes. Baby was weaned off from CPAP and started on feeds by day 10 of life. Discharged on day 15 of life.

Diagnosis: MIS –N (Necrotizing enterocolitis)

Case -3

A male neonate born at 39 weeks' period of gestation with birth weight of 3.4 kg by normal vaginal delivery. Baby was vigorous at birth and roomed in with mother for breast feeding. Noticed to have abnormal jerky movements of both upper limbs with lip smacking movements 12 hours after birth. Shifted to NICU immediately. Examination suggestive of afebrile neonate with no neurocutaneous markers with Heart rate – 140/min, Respiratory rate – 40 /min, Spo2 – 96 % at room air. Neurological examination was unremarkable. Managed with intravenous phenobarbitone (loading dose) followed by maintenance dose. Baby had 03 more episodes of seizures in a period of 48 hours. Sepsis screen was suggestive of CRP- 35mg/dl, Total leukocyte count 17,800 with 40 % neutrophils. CSF study and USG cranium were normal. Baby was managed with intravenous antibiotics and antiepileptics. Urine GCMS and Blood TMS was normal subsequently.

Mother was unvaccinated for coronavirus disease 2019 (CoVID-19) and had a SARS-CoV-2 infection five weeks before delivery. The baby had high titers of Ig G antibodies 290 AU/mL with negative IgM titres for SARS-CoV-2 with raised inflammatory markers (Ferritin – 398 ng/ml, Procalcitonin – 26 ng/ml, D – dimer – 4276 ng/ml). The SARS-CoV-2 reverse transcriptase – polymerase chain reaction (RT-PCR) of the neonate was negative. Blood culture was sterile. Managed with i.v. methylprednisolone 2mg/kg/day in two

divided doses for 03 days along with intravenous immunoglobulin 2g/kg stat. The neonate showed dramatic improvement with resolution of seizures within 12 hours of treatment. Started on feeds on day 4 of life and discharged on day 9 of life with intact neurological status.

Diagnosis: MIS –N (Seizures)

DISCUSSION:

MIS-N presents as a syndrome occurring post-exposure to SARS-CoV2, manifesting with a variety of clinical presentations. The diagnosis of MIS-N can be challenging and needs a high index of suspicion after all other potential etiologies have been ruled out. Multisystem inflammatory syndrome in neonates (MIS-N) is hypothesized to be caused either following transplacental transfer of SARS-CoV2 antibodies or antibodies developed in the neonate after infection with SARS-CoV-2. Diagnosing MIS-N in neonates is even more challenging. MIS-N is proposed to be a disease manifestation of antibody-mediated immune activation affecting various organs rather than the infection itself. (4)

Neonates with MIS-N present with respiratory (respiratory distress), cardiac (cardiac dysfunction, coronary aneurysms, thrombus, conduction abnormalities), gastrointestinal (NEC), central nervous system (encephalopathy, stroke), dermatological (vasculitis rash), and sepsis-like (fever, hypothermia, shock) manifestations. Immunomodulatory therapy (IVIG, steroids) forms the crux of management of MIS-N (5). In our case the neonates presented with atypical manifestations of MIS-N like frequent apneic episodes, seizures and severe necrotizing enter colitis. This is a small case series with self-reported data and therefore has its limitations. Despite various clinical presentations described in the literature this preliminary data may add to the growing evidence on MIS-N. Pediatricians need to be well converse with growing cases of MIS-N and its management to save precious lives.

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