



Fatal Covid-19 in a Malnourished Child with Megaloblastic Anemia

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To the Editor: Children with COVID-19 have relatively mild presentation and less mortality [1]. Malnourished children have sarcopenia and higher risk of death due to infections [2]. We report a case of fatal COVID-19 disease in a severely malnourished young child.

A 13-mo-old girl presented with fever for 2 d, vomiting, refusal to feed and breathlessness for one day prior to admission with increasing paleness and lethargy since two weeks. There was no history of cough or runny nose, contact with a COVID positive case or premorbid significant illness. History of faulty complementary feeding was noted with calorie and protein deficient diet.

On examination, child had severe pallor with 2 cm palpable liver (span 6 cm) and no splenomegaly. Child had severe acute malnutrition (length 62 cm, weight 5.9 kg, weight for length below -3 SD and mid upper arm circumference 11.5 cm) with hyperpigmentation of hands and feet indicating B12 deficiency. Tachypnea (respiratory rate 44/min) and tachycardia (heart rate 140/min) were noted. Blood pressure was 76/40 mmHg (5th to 50th centile). Chest examination revealed no adventitious sounds. SpO₂ in air was 96%.

Initial laboratory workup revealed hemoglobin of 2.2 g/dl, total white cell count of 13,000/cumm (Neutrophil: Lymphocyte ratio, NLR 0.28) and platelet count of 105,000/cumm. Peripheral smear showed macrocytes and hypersegmented neutrophils. Serum bilirubin was 2.1 mg/dl (indirect 1.7 mg/dl) with normal transaminases and deranged PT INR (2.1). Blood and urine cultures were sterile. Chest X-ray showed mild right parahilar infiltrates.

A swab for SARS CoV2 was positive by RT-PCR. There was significantly elevated serum ferritin (1976 ng/ml), CRP (2.8 mg/dl), D-dimer levels (8.5 mg/L) and serum triglycerides (270 mg/dl). Vitamin B12 levels were low (50 ng/ml).

A possibility of infection induced Hemophagocytic lymphohistiocytosis (HLH) was thought (in view of persistent fever, pancytopenia, hyperferritinemia, hypertriglyceridemia and hemophagocytosis on bone marrow), child was given IV methylprednisolone and IVIG apart from meropenem and B12. However, the child developed progressive anemia, leukopenia and thrombocytopenia. In view of worsening respiratory distress with hypoxia and chest X-ray showing acute respiratory distress syndrome (ARDS), the child was mechanically ventilated and standard ARDS management was followed. However, child succumbed to COVID-19 on day 6 of admission. Bone marrow confirmed Hemophagocytic lymphohistiocytosis.

Malnutrition affects both the innate and adaptive immune responses [3] with longer viral persistence and increased trafficking of inflammatory cells to lungs. Insufficient protein intakes may lead to nutrition-related sarcopenia [4]. Some micronutrients including B12 have important role in innate immune responses [5].

To the best of our knowledge, this is the first case report of a severely malnourished child with severe megaloblastic anemia and HLH succumbing to COVID-19. It may be worthwhile exploring if malnutrition and vitamin B12 deficiency are independent risk factors for severe COVID-19 disease.

Compliance with Ethical Standards

Conflict of Interest None.

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