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Case Report
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Autoimmune Hemolytic Anemia (AIHA) Associated with COVID-19 Infection: A Rare Case Report

Shhada E[1], Abduljalil N[2], Gharib G[2], Barhoom D[2] and Ali S[3]*

[1]Department of Pediatrics, Children's Damascus University Hospital, Damascus University, Damascus, Syria

[2]Department of Pediatrics, Children's Damascus University Hospital, Syria

[3]Department of Pulmonary Pediatrics, Children's Damascus University Hospital, Syria

Abstract

Coronavirus is an epidemic in the recent time in the world. COVID-19 Infection presents as a spectrum manifestation have been described. However, only few reports of Autoimmune Hemolytic Anemia (AIHA) rarely associated with COVID-19 in children so far. Here, we report a case of severe AIHA in a 12-year-old female Syrian with SARS-CoV-2 infection.

Keywords: Autoimmune hemolytic anemia; COVID-19; SARS-CoV-2

Introduction

Coronavirus Disease 2019 (COVID-19) infection associated with multisystem disease, and present with many manifestations. Autoimmune diseases are rare disorders are characterized by auto-antibodies associated with COVID-19 in children. The mechanism mainly implicated in the pathogenesis of multi organ dysfunction is hyper inflammatory syndrome, which causes fulminant and fatal cytokine release, associated with disease severity and poor outcome. However, the relation between COVID-19 and immune-mediated disease remains unclear [1-4]. The spectrum of complications also includes various autoimmune disorders such as autoimmune thrombocytopenia, Guillain–Barré syndrome and anti-phosphor lipid antibody syndrome [5-7].

Autoimmune Hemolytic Anemia (AIHA) is a rare autoimmune disorder, often secondary to self-limited similar to other viral or bacterial infections, and will be considered during this pandemic. Through this paper, we propose the diagnosis and management techniques. And when treatment is required, corticosteroids represent the first-line therapy.

Case Presentation

A 12-old female was admitted to our hospital with severe anemia (Hemoglobin [Hb] level of 5.4 gm/dl). She presented with fever, cough, malaise and myalgia after 1-week duration and high colored urine of 2-day duration. The patient was treated as upper respiratory infection without improvement until she was developed hematuria, so she referred to our hospital for detailed evaluation. On examination, she was pale, febrile, hemodynamically stable with the following vital signs: Temperature, 38.7°C; blood pressure, 110/65 mmHg; heart rate, 115 beats/min; respiratory rate, 20/min; and oxygen saturation, 99% at room air. She had no clubbing, cyanosis, lymphadenopathy, edema, arthritis or rash. Cutaneous stigmata of chronic liver disease were not present. Respiratory, cardiovascular, gastrointestinal and central nervous system were normal on examination. SARS-CoV-2 infection was confirmed by RT-PCR of nasopharyngeal swab. Other laboratory values at the time of admission are given I because of a 7-day period of fever (37.5°C), asthenia, headache, and a syncope episode without loss of consciousness. She denied respiratory or gastrointestinal symptoms.

At admission, she had tachycardia with hemodynamic stability and mucocutaneous pallor. No other abnormalities were found in physical examination.

Laboratory tests were performed and revealed: (Hg: 6 g/dL, MCV: 64, RDW: 9, Plt: 451 × 10^3), reticulocyte level = 5. Coombs test was positive, erythrocyte sedimentation rate 34 mm/h, C-Reactive Protein (CRP) = 0.2 mg/L.

Elevated unconjugated bilirubin and lactate dehydrogenase, serum Aspartate Aminotransferase (AST) comparatively higher than serum Alanine Aminotransferase (ALT).

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Correspondence:
Eman Shhada, Department of Pediatrics, Children's Damascus University Hospital, Damascus University, Damascus, Syria, Tel: 00963965510919; E-mail: eman91shhada2511@gmail.com

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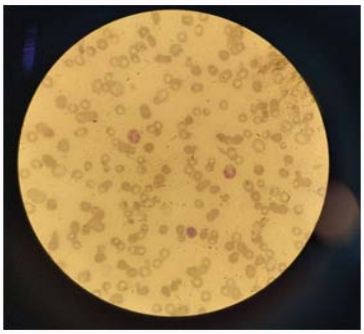

Figure 1: Peripheral blood smear, showed: Hypochromia, some polychromatic macrocytes, anisocytosis, red cell fragmentation with moderate numbers of micro-spherocytes and nucleated red cell compatible with hemolytic anemia features.

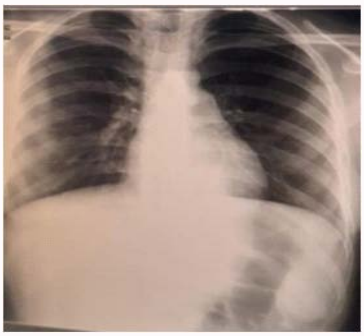

Figure 2: Un-markable chest X-Ray.

Serum electrolytes and renal functions levels were within normal range. Hypochromia, some polychromatic macrocytes, anisocytosis, red cell fragmentation with moderate numbers of micro-spherocytes and nucleated red cell compatible with hemolytic anemia features were detected at peripheral blood smear (Figure 1).

Urine analysis showed dark urine with positive of hemoglobin.

Chest X-ray was unremarkable (Figure 2).

AIHA was diagnosed and the treatment with methyl prednisolone pulses (30 mg/kg daily) was given for the first 72 h. Afterward, the maintenance dose with prednisolone 1 mg/kg daily was administered. After 2 weeks later, hemolysis reduced, and hemoglobin value increased to 8.2 g/dL without the need for blood transfusions. After 2 months, at follow up the patient, the laboratory tests showed that the hemoglobin and reticulocyte levels were is normalized slowly, negative Coombs value, with improvement the vitality and general condition.

Discussion

AIHA is a rare disease that affects 1 to 3/100,000 persons per year and can affect a wide age range.

AIHA is classified as primary or secondary, depending on the etiology. [11] Secondary AIHA can be due many viral or bacterial infections such as *Cytomegalovirus*, HIV, hepatitis Cor EBV infection. Although rare, SARS-CoV-2 infection has now been established as a secondary cause of AIHA based on cases reported in the literature [8,9].

Since the beginning of the pandemic, AIHA has been described in adults with COVID-19 [8,10] and appears to be even rarer in children [1,2,4].

We reported our case in this pandemic associated with COVID-19 after exclusive other causes of hemolytic anemia.

There are five pediatric patients reported in literature developed severe anemia during the acute phase of COVID-19 infection (hemoglobin range 2.3 g/dl to 6.3 g/dl) without symptoms of severe respiratory syndrome, so our patient is the sixth case in literature [2,4,5,8].

Pallor, weakness, jaundice, dark urine and splenomegaly can occur following acute AIHA. Anemia, reticulocytosis, elevated unconjugated bilirubin and lactate dehydrogenase, serum aspartate amino transferase comparatively higher than serum alanine amino transferase, and low haptoglobin are all common laboratory findings observed in AIHA [10]. Our patient also presented with these features, without splenomegaly which was suggestive of hemolytic anemia [2-5].

When treatment is required, corticosteroids represent the first-line therapy. Other options include rituximab and IVIG [6,7,9].

All patients had received steroids as first-line therapy, while only one child required rituximab, because of refractory course of disease [1,3] while our patient received only steroid as monotherapy. All patients showed a clinical response within 1 month. One child was previously affected by refractory chronic ITP2, also our patient response to the drug during 1 month.

Conclusion

AIHA associated with COVID-19 is a rare combination; this paper suggests that SARS-CoV-2 can induce AIHA in children. In this current pandemic, finding of severe hemolytic anemia without any presentation of COVID-19 in a previously healthy child, SARS-CoV-2 infection should be considered.

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