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Case Report

A 5-month patient with ITP secondary to SARS-CoV-2

SARS-CoV-2' ye ikincil ITP gelişen 5 aylık hasta

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ABSTRACT

Idiopathic thrombocytopenic purpura (ITP) is a hematological disease characterized by the immune-mediated destruction of platelets. It either resolves or becomes chronic. Before the onset of ITP, many children have an antecedent viral illness, which can be an upper respiratory infection or gastroenteritis. Regarding ITP frequency, infancy is the least prevalent age group when compared to older children. In this case report, we present the first infantile case of ITP associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that was successfully treated with intravenous immunoglobulin (IVIg).

Keywords: *SARS-CoV-2, idiopathic thrombocytopenic purpura, intravenous immunoglobulin*

ÖZET

İdiopatik trombositopenik purpura(ITP), trombositlerin immün aracılı yıkımı ile karakterize hematolojik bir hastalıktır. Düzelir ya da kronikleşir. ITP'nin başlangıcından önce, birçok çocukta üst solunum yolu enfeksiyonu veya ishale neden olabilen öncül viral hastalık vardır. Bebeklik dönemi, ITP sıklığı açısından daha büyük çocuklara kıyasla hastalığın en az görüldüğü yaş grubudur. Bu olgu çalışmasında, intravenöz immünglobulin (IVIg) ile başarılı bir şekilde tedavi edilen SARS-CoV-2 ile ilişkili ilk infantil ITP vakasını sunuyoruz.

Keywords: *SARS-CoV-2, idiopatik trombositopenik purpura, intravenöz immünglobulin*

INTRODUCTION

ITP is an immune-mediated acquired disorder affecting adults and children and is defined as a temporary or chronic reduction in platelet count (1). It is diagnosed in a patient with isolated thrombocytopenia (peripheral blood platelet count of <100 x10^9/L) without any other abnormalities in complete blood count or blood cell differentiation who is otherwise healthy (2). The major mechanism is platelet destruction due to a lack of tolerance for the patient's own platelets. T cell abnormalities, such as enhanced Th1 and cytotoxic T cell activation and reduced Treg activation, are thought to play a role in the immunopathogenesis of ITP (3). Patients may experience clinical symptoms ranging from asymptomatic to life-threatening bleeding, depending on the severity of their thrombocytopenia and individual characteristics (1,4). Before the onset of ITP, the majority of children had a history of infectious illness, which might be upper respiratory infection or gastroenteritis. Specific viral agents (rubella, varicella, mumps, rubeola, or infectious mononucleosis) are responsible

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in a small number of instances. Acute ITP may also be caused by live vaccinations, particularly the MMR vaccine. The interval between antecedent infection and purpura in children with ITP varies from days to weeks, with the most common gap being around two weeks (5).

A multitude of events may cause the development of autoimmune disorders (AIDs) by causing the immune system to become overly activated. Viruses are a significant part of the environmental elements that have an impact on the immune system. Viruses, such as Epstein-Barr virus (EBV), cytomegalovirus (CMV), human immunodeficiency virus (HIV), and human T lymphotropic virus 1 (HTLV-1), have been linked to many AIDs. As evidenced by different records demonstrating the proclivity of individuals with coronavirus disease 2019 (COVID-19) to develop multiple types of autoantibodies, SARS-CoV-2 is likely to elicit autoantibodies against a person's own platelets (6). Because acute ITP is benign in most children, has a self-limiting course, and life-threatening complications, such as intracranial hemorrhage, are extremely rare, simple follow-up without intervention has been documented to improve platelet counts similarly to those in the intervention group (7). In acute ITP, the platelet count alone should not be utilized as criterion for pharmacological therapy. Patients with active bleeding should be treated if their platelet count is less than $20x10^9$/L or if their bleeding is life-threatening regardless of platelet level (8). IVIg, corticosteroids, and anti-D immunoglobulin are among the first-line treatments for both children and adults (9). Oral prednisone at a dosage of 1 to 2 mg/kg per day, administered in split doses and continued for a few weeks, is the corticosteroid treatment regimen used to treat children with newly diagnosed ITP in most published trials and across the world. In a systematic review and network meta-analysis, it was shown that in children with newly diagnosed ITP, IVIg was superior to corticosteroid regarding early response rates defined as platelet count over $20X\ 10^9$/L and lack of bleeding at 24 hours, 48 hours, 72 hours, and seven days. Lower adverse events ratio was also a favourable outcome of IVIg (10). A single dose of 0.8 gr/kg IVIg administration has also been suggested as first-line therapy. Subsequent IVIg doses or corticosteroids may be reserved for the children based on the clinical circumstances and follow-up platelet counts (11).

We present a case of acute ITP successfully treated with IVIg in which SARS-CoV-2 was the potentially responsible preceding infectious agent.

Case Report

A 5-month-old, previously healthy boy presented to our hospital's emergency department with bruises that started two days ago. His vital signs were normal, and his general condition was good. Physical examination revealed ecchymoses on his knees and forearms, as well as petechial hemorrhages in his mouth but otherwise unremarkable with hepatosplenomegaly or lymphadenopathy (Figures 1 and 2). Laboratory examination showed severe thrombocytopenia (platelet count: $6x10^9$/L, MPV: 10.6 fl) with Hb: 13.7 gr/dl and total leukocyte: 7.7 $x10^9$/L (N: 27%, L: 54%, M: 18%). Coagulation and biochemistry tests were all normal. The patient's history revealed real-time polymerase chain reaction (RT-PCR) confirmed COVID-19 infection two weeks earlier with mild pyrexia, cough, and rhinorrhea that lasted two days and required no hospitalization. Owing to mucocutaneous hemorrhagic findings plus platelet count below $20x10^9$/L, IVIg was administered (0.8 gr/kg/dose). Platelet count was checked 48 hours after infusion and $13x10^9$/L. Due to the ongoing mucocutaneous bleeding, a second IVIg (0.8 gr/kg/dose) was administered again. Clinical and laboratory findings were improved after the second dose. Platelet counts during three weeks are illustrated in Figure 3. The consent of the patient's parents was obtained for this study.

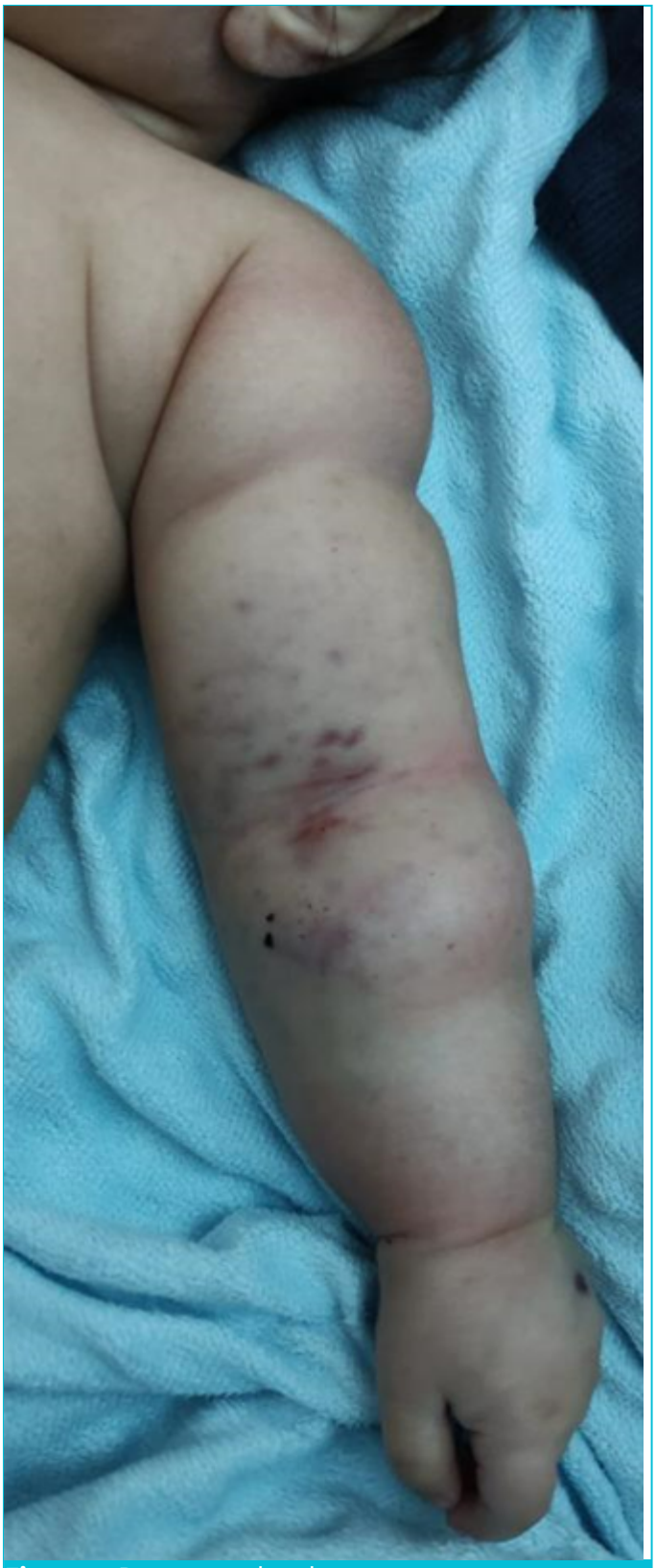

Figure 1. Purpura and ecchymoses on arm.

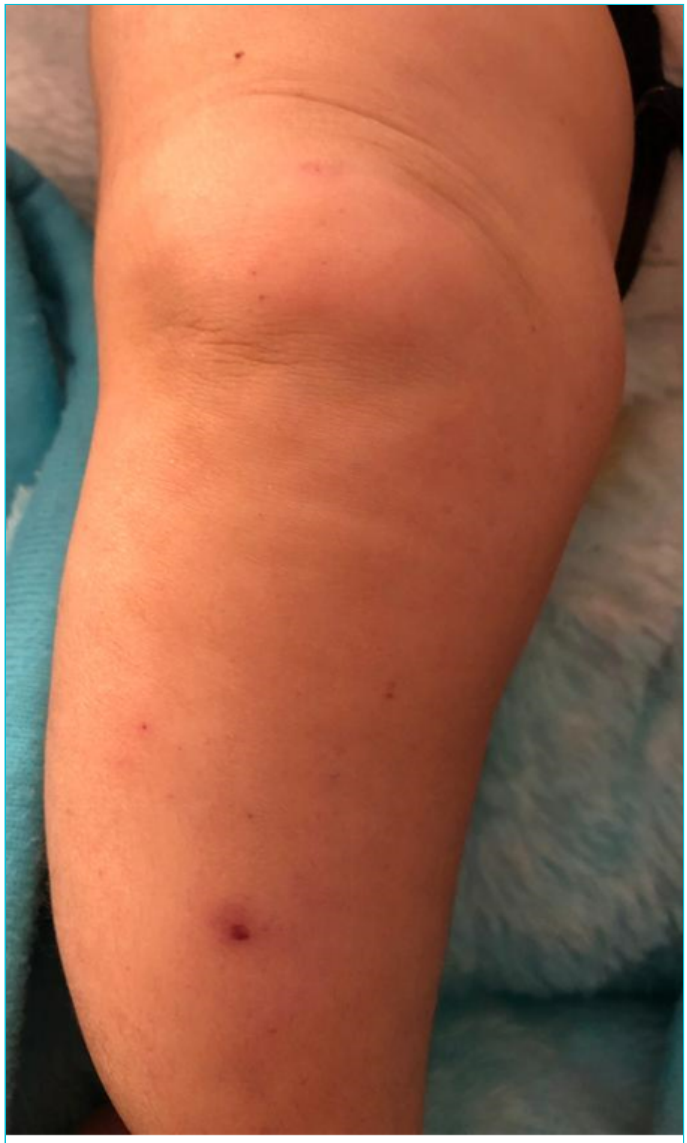

Figure 2. Petechiae and ecchymoses on shin.

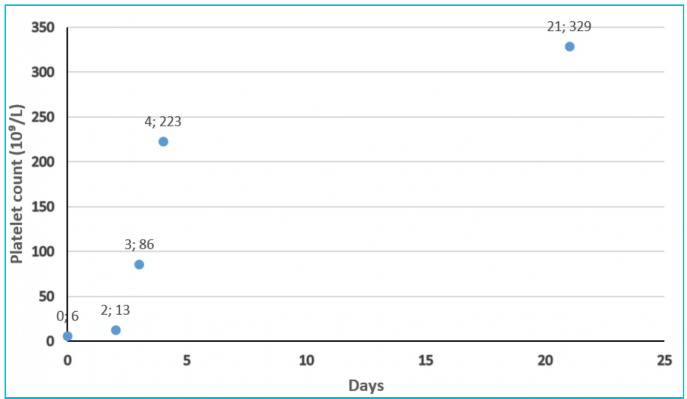

Figure 3. Graph showing platelet trend. The graph reflects the patient's measured platelet count on admission, during hospital course, and post-discharge follow-up.

DISCUSSION

In this case report, we aimed to display that SARS-CoV-2 might be a preceding pathogen in ITP. Acute ITP linked to SARS-CoV-2 has been recorded in a few case reports, mostly in adults (12-15). Tsao et al. (15) reported the first pediatric case of SARS-CoV-2-associated ITP in a 10-year-old patient. Subsequently, two patients from Greece, aged 15 and 3, were diagnosed with SARS-CoV-2-associated ITP (16). Infancy is the least common age period compared to older children concerning ITP frequency (7.6%) (17). In this context, the current study represents the first infantile case of ITP associated with SARS-CoV-2. In the current case, a single dose of 0.8 g/kg IVIg was administered initially, followed by a second equal dose of IVIg as platelet counts remained below 20 x 10^9/L at 48 hours after treatment began. Any platelet count of at least 100X10^9/L is considered a full response in the management of ITP, whereas any platelet count of 30 to 100X10^9/L, as well as a doubling of the baseline level, is deemed "response"(1). We achieved response and complete response at 72 and 96 hours, respectively. The aforementioned reports in children with SARS-CoV-2 related ITP, a single dose of 1 gr/kg IVIg was efficacious in improving laboratory and clinical findings (15, 16).

In the light of the current reported case, it should be noted that SARS-CoV-2 may be a potential trigger of ITP like other infections. As a result, when evaluating individuals with ITP, it is recommended that the previous history question be expanded to include COVID-19 infection.

Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

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