CASE REPORT

Atypical presentation of systemic lupus erythematosus in a 16-year-old boy: Case report

Présentation atypique du lupus érythémateux systémique chez un garçon de 16 ans: Cas clinique

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Abstract

Introduction: Systemic lupus erythematosus (SLE) is a chronic autoimmune disease, characterized by a clear female predominance and a major clinical polymorphism. Some initial presentations, particularly in children and adolescents are exceptional. Our objective was to report an unusual initial presentation of SLE in a male adolescent.

Observation: We reported the case of a 16-year- old tunisian boy who was referred to the hematology emergency department because of a hemorrhagic syndrome. The evolution was marked by pancytopenia, prolonged fever and an anasarca with recurrent cardiac tamponade. Explorations concluded to SLE. The patient was started on pulse therapy of dexamethasone followed by immunoglobulin. He was also provided with pericardiocentesis with a favorable outcome.

Conclusion: SLE is characterized by clinical polymorphism, that's why diagnosis and management of complications could be difficult. SLE should be considered in differential diagnosis of many disorders, such as pancytopenia and cardiac tamponade.

Key words: Cardiac Tamponade; Case Reports; Cytopenia; Pediatrics; Systemic Lupus Erythematosus

Résumé

Introduction: Le lupus érythémateux systémique (LES) est une maladie auto-immune chronique, caractérisée par une nette prédominance féminine et un polymorphisme clinique majeur. Certaines présentations initiales, particulièrement chez les enfants et les adolescents sont exceptionnelles. Notre objectif était de rapporter une présentation initiale inhabituelle du LES chez un adolescent de sexe masculin.

Observation: Nous rapportons le cas d'un garçon tunisien de 16 ans, qui a été adressé aux urgences d'hématologie pour un syndrome hémorragique. L'évolution était marquée par une pancytopénie, une fièvre prolongée et une anasarque avec tamponnade cardiaque récurrente. Les explorations ont conclu à un LES. Le patient a été mis sous bolus de corticoïdes suivi d'immunoglobines. Il a eu également une péricardiocentèse avec une évolution favorable.

Conclusion: Le LES est caractérisé par un polymorphisme clinique, c'est pourquoi le diagnostic et la prise en charge des complications pourraient être difficiles. Le LES devrait être évoqué devant certaines anomalies, tel que la pancytopénie et la tamponnade cardiaque.

Mots clés: Cytopénie; Lupus érythémateux disséminé; Pédiatrie; Présentations de cas; Tamponnade cardiaque

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 DOI: 10.62438/tunismed.v102i10.5065

Introduction

Systemic lupus erythematosus (SLE) is a chronic, autoimmune inflammatory disease that can involve any organ system (1,2). About 10% of all patients with SLE are diagnosed during childhood (1–3). Pediatric forms are typically associated with a more severe clinical course compared to adults (2).

Cardiac manifestations are common, especially pericarditis (1,4). However, cardiac tamponade is very rare and exceptionally revealing the disease (4). Similarly, hematological abnormalities are one of the most common manifestations of SLE. Nevertheless, pancytopenia is a rare discovery circumstance and is associated with a poor prognosis (5).

Our objective was to report the case of a 16-year-old boy who presented SLE discovered through a clinical course including pancytopenia, long fever and generalized edema with cardiac tamponade.

Reported case

A 16-year-old boy, from Northwest Tunisia, was referred to the hematology emergency department for a hemorrhagic syndrome. The patient had no past medical history. Over the last month, the patient noticed significant weight loss, intermittent fever and night sweats. He reported no arthralgia or any medication use. On examination, he was apyretic and pale. He had petechiae, oral bleeding, centimetric cervical lymphadenopathy with 4 cm splenomegaly and 14 cm hepatomegaly. The rest of physical examination did not show any abnormalities. First-line laboratory investigations revealed a white blood cell count at 5.1 G/L [4-10 G/L] (Neutrophils: 3.8 G/L [1.5-8 G/L], Lymphocytes: 1 G/L [1-5 G/L]), a normochromic normocytic aregenerative anemia with hemoglobin level at 118 g/L [130-180 g/L] with reticulocytes count at 77 G/L [25-75 G/L], and a thrombocytopenia at 22 G/L [150-450 G/L]. The blood smear noted 81% of neutrophils, 1% of basophils, 2% of monocytes and 16% of lymphoid elements evoking activated lymphocytes or lymphoma cells. The sternal aspiration showed a rich marrow. Megakaryocytes were present and there were signs of dyserythropoiesis with no excess of blasts. A peripheral thrombocytopenia was then retained and etiological investigations were performed. However, few days later the adolescent presented a headache and blurred vision. The hemogram showed a pancytopenia (thrombocytopenia at 5 G/L, anemia at 71 g/L, neutropenia at 0.69 G/L and lymphopenia at 0.91 G/L) (Figure 1). The patient was admitted to the pediatric hematology department. A cerebral hemorrhage was eliminated by a cerebral computed tomography (CT) scan. The fundus examination revealed a pre-retinal hemorrhage of low abundance. The course was quickly marked by prolonged fever, peripheral oedema with high blood pressure of 160/100 mmHg and an increased jugular venous pressure. There were no chest pain or dyspnea. Neutrophils level ranged between 0.42 and 1.54 G/L. We objectified regenerative anemia at 60 g/L and reticulocytes level at 138 G/L, without biological signs of hemolysis (total bilirubin = 17.5 µmol/l [5-21 µmol/l], lactate dehydrogenase = 498 IU/L [91-180 IU/L], haptoglobin = 1.11 g/L [0.4-2.8 g/L]). However, the direct Coombs test was positive at 3+ immunoglobulin G and the irregular agglutinins test was negative. Laboratory investigations revealed a plasmatic protein level at 70 g/L [60-80 g/L], hypoalbuminemia at 0.42 mmol/L [0.51-0.81 mmol/L] and polyclonal hypergammaglobulinemia at 23.7 g/L [6-12 g/L]. Immunoglobulin dosage was normal. Renal and liver functions were also normal. C-reactive protein (CRP) was 20 mg/L [< 0.5 mg/L]. Thyroid stimulating hormone was 0.305 µIU/ml [0.34-5.6 µIU/ml]. Urinalysis showed proteinuria at 1.9 g/24h [< 0.15 g/24h].

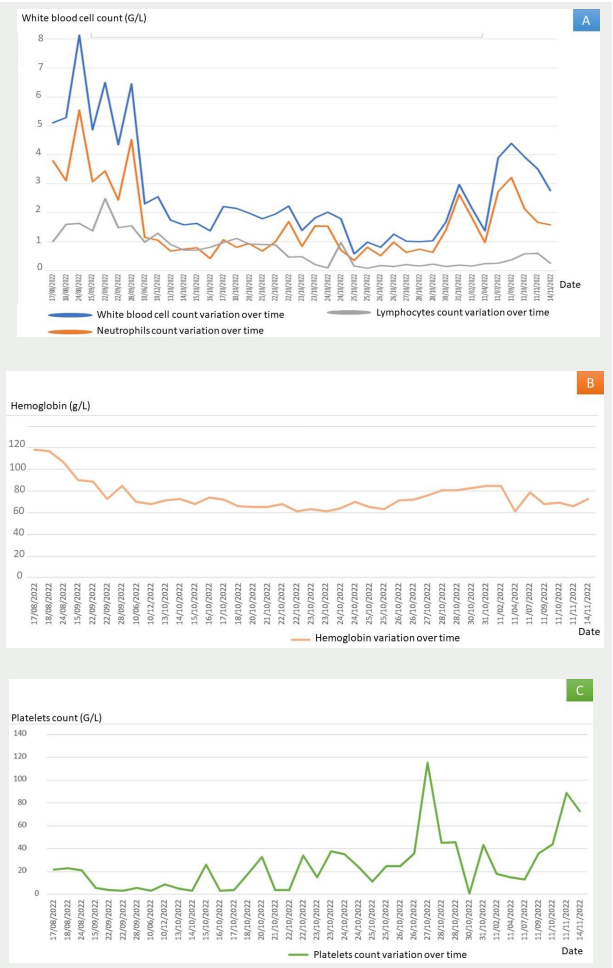

Figure 1. Curves showing hemoglobin level, white blood cell and platelets count variation over time.
A Curve showing white blood cell count variation over time.
B Curve showing hemoglobin level variation over time.
C Curve showing platelets count variation over time.

The chest X-ray displayed an enlarged cardiac silhouette with a left-sided pulmonary infiltrate (Figure 2). Thus, a transthoracic echocardiography was performed showing massive pericardial effusion of 38 mm and right atrium collapse. The patient was diagnosed with cardiac tamponade and suspected myocarditis. A body CT scan was also performed in emergency noting moderate lymph node proliferation, a massive pericardial effusion, a moderate bilateral pleural effusion, an intraperitoneal

effusion of medium abundance and a homogeneous hepatosplenomegaly of 18 and 13.9 cm respectively.

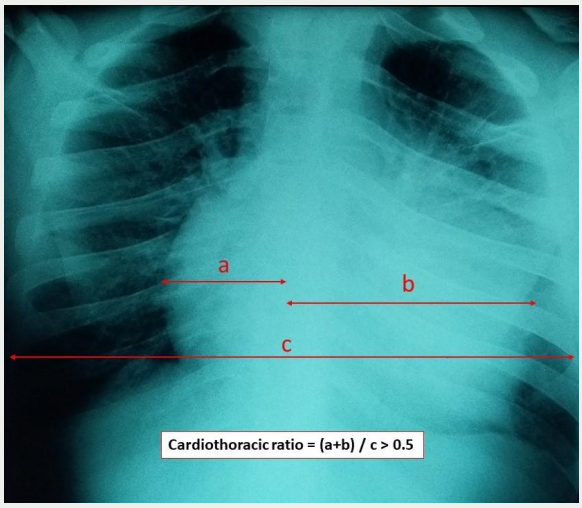

Figure 2. Chest X-ray showing enlarged cardiac silhouette with a left-sided pulmonary infiltrate.

Management of cardiac tamponade was an emergency. However, pericardiocentesis could not be performed with a thrombocytopenia at 4 G/L. The patient was administered corticosteroids and intravenous immunoglobulin. First, he received dexamethasone at 40 mg/day for 3 days followed by 4 days of immunoglobulin at 0.5 g/ kg, associated with platelet transfusion. Then, pericardiocentesis was done using local anesthesia. The fluid was citrine yellow with a volume of 800 ml on the first day. Cytological, biochemical and microbiological analysis of fluid were normal. Tuberculosis test and Wright serology were negative. The course was marked by the recurrence of tamponade in few days, associated with cardiogenic shock and disseminated intravascular coagulation (DIC). The laboratory test showed thrombocytopenia at 18 G/L, a low prothrombin time at 49% [70- 120%], an activated partial thromboplastin time ratio at 1.68 [0.8-1.2] and a low fibrinogen level at 1.12 g/L [2-4 g/L]. CRP was 115 mg/L with positive procalcitonin. The patient was administered norepinephrine velocity 2, colchicine and broad-spectrum antibiotic therapy with transfusion. The pericardial effusion was drained surgically, but the patient presented the next day a second relapse of cardiac tamponade. He had heavy bleeding in the redon and acute anemia at 47 g/L. The patient was hospitalized in the intensive care unit for 72 hours for stabilization. A pericardial biopsy was accomplished revealing an inflammatory aspect with no evidence of malignancy. The use of the Congo Red stain kit did not reveal any amyloid deposition on the pericardial fragment. Viral screening tests for coronavirus disease, Epstein Barr virus, Cytomegalovirus, hepatitis B and C, Herpes virus type 6 and 8, Human parvovirus B19 and human immuno-deficiency virus, were normal. Immunological screening was positive for antinuclear antibody, anti-double stranded DNA, anti-Smith antibodies and anti-extractable nuclear antigens antibodies. Serum C3, C4 and CH50 complement factors were low (C3 = 0.281 g/L [0.5-1 g/L], C4 = 0.017 g/L [0.2-0.4 g/L], CH50 < 10% [70-120%]). After a 25 days-fever, the patient finally maintained a stable apyrexia. Blood pressure was normal with furosemide, bisoprolol and angiotensin-converting enzyme inhibitors. The patient was no longer neutropenic with stable hemoglobin level at 70 g/L and the platelet count was above 20 G/L. The ultrasound control displayed normal left ventricular systolic function with an ejection fraction of 56.7%, a pericardial effusion of 21 mm with a slight collapse of the right atrium. The patient was referred to the internal medicine department and the diagnosis of SLE was established. He was treated with hydroxychloroquine and corticosteroids. A renal biopsy was performed confirming lupus nephritis. The long-term follow-up found that the patient was stable with azathioprine and corticosteroids treatment.

Discussion

Childhood-onset SLE is characterized by atypical and severe presentations. To avoid delays in diagnosing and treating SLE and to improve long-term outcomes for pediatric patients, it is important to perform an accurate and a prompt diagnosis by considering SLE as a possible differential diagnosis of hemorrhagic syndrome and cardiac tamponade in the appropriate clinical setting (4, 6). Here, we reported the case of a 16-year-old boy with an unusual presentation of SLE associating pancytopenia, prolonged fever and an anasarca with recurrent cardiac tamponade.

Our report had some limitations. As a single case report, the findings cannot be generalized to all pediatric SLE patients. A literature review is needed to validate the observations and conclusions drawn from this case. Also, we discussed only severe and unusual manifestations of SLE. Our report does not provide information on how to recognize and manage typical and milder symptoms, which could provide a more comprehensive overview of pediatric SLE.

However, our report presented the following strong points. First, it provides a detailed account of the patient's symptoms, clinical findings, diagnostic procedures and treatment steps. This thoroughness helps in understanding the complexity and severity of the case. Second, the focus on atypical presentations such as cardiac tamponade and pancytopenia in pediatric SLE patient is significant. This contributes valuable information to the existing literature, as these manifestations are rare and can be easily overlooked. Third, the extensive diagnostic work-up, including laboratory tests, imaging and pericardial biopsy, showcases the importance of a methodical approach in diagnosing complex cases like SLE and elaborates on how other potential diagnoses were ruled out. This can serve as a useful reference for clinicians encountering similar presentations. Fourth, the report outlines the management strategies used, including corticosteroids, immunoglobulins and pericardiocentesis. This can inform and guide treatment protocols for similar cases in the future. Fifth, the case provides long-term follow-up information on the adolescent. This is valuable to assess the efficacy of the treatment. Finally, by discussing the

prognosis and outcomes, our report provides insight into the potential challenges and complications in managing pediatric SLE, especially with atypical presentations. This helps in setting realistic expectations for clinicians and families.

The diagnosis of SLE in our case was established approximately in three months. The time interval between children SLE onset and diagnosis is variable, ranging from days to years, resulting in acute, intermittent or chronic disease at presentation. According to Novak et al. (7), this interval was short (< 1 month) intermediate (≥ 1 and < 3 months), and long (≥ 3 months) in 4%, 33.5%, and 62.5% of cases, respectively. The median age at diagnosis among the 1555 childhood-onset SLE [11.1 (4.2–17) vs. 12.0 (1.9–17.7) vs. 12.5 (3–18) years, p=0.025, respectively] was significantly lower in the short interval group compared to others (7).

Men with SLE have a poorer long-term prognosis with accelerated development of organ damage compared to women (8). Men are also reported to have more frequent serositis, cardiovascular disease, cytopenia, hemolytic anemia, nephritis, antiphospholipid antibodies and thrombotic events and seizures, which was the case of the adolescent boy outcome reported here (8). In addition, the patient presented a cardiac tamponade, which is a very rare initial manifestation of SLE. It has only been described in 1.3% of patients in a multicenter cross-sectional study of 155 SLE patients (<16 years) (9). What is unique about our case is that the patient did not present any chest pain or shortness of breath related to the cardiac tamponade comparing with similar cases described in the literature (4, 9). However, the only supportive clinical signs were fever, edema and arterial hypertension. This case is similar to the case report of Umer et al. (10), which described the case of an 11-year-old girl who was presented to the emergency department with complaints of intermittent fever, periorbital puffiness, abdominal distension, and swelling on the hands and feet. The patient was not in any acute distress but was vitally unstable (10). Blood investigations revealed anemia and thrombocytopenia (10). Chest X-ray showed an enlarged cardiac silhouette (10). Urine detailed report showed proteinuria and hematuria (10). Further investigations revealed the autoimmune root of the disease (10). Even worse, our patient had initial improvement with pericardiocentesis but deterioration occurred in few days with cardiogenic shock and DIC requiring a surgical pericardiocentesis, continuous drainage and in an intensive care unit admission. Pericardiocentesis works as a management option as well as a diagnostic means by which pericardial fluid can be analyzed, in order to reveal the underlying etiology of effusion.

What further worsened the prognosis was pancytopenia and especially a severe thrombocytopenia. The spectrum of hematologic manifestations in SLE is very broad. Lymphadenopathy and splenomegaly can be also identified, which was the case in our report (5). The etiologies of pancytopenia are variables. They were dominated by a flare-up of the disease. Anemia due to chronic disease is the most frequent in patients with SLE, representing approximately one-third of the cases (5). Iron deficiency anemia and autoimmune hemolytic anemia are also common causes. The most common cause of thrombocytopenia is immune thrombocytopenia. When it is accompanied by anemia, it is called Evans syndrome (5). In a case-report study, it was documented that thrombocytopenia was associated with a higher degree of organ damage (5). The first line of treatment of immune cytopenia includes high-dose of glucocorticoids (5). Immunoglobulins can increase the platelet count between 24 and 48 hours, being more useful before surgery. Other immunosuppressive treatments have also been used, such as rituximab (5). Bone marrow biopsy should be considered in cases of pancytopenia or anemia of unknown cause to rule out less common hematologic disorders, such as aplastic anemia and autoimmune myelofibrosis (5).

Management of SLE includes combination therapy with steroids and immunosuppressants such as mycophenolate mofetil or azathioprine. This regime slows the disease progression and prevents organ damage mainly by inactivating the autoantibodies (10). Our adolescent was treated by corticosteroids and azathioprine, and he is actually stable.

The initial differential diagnosis for SLE includes viral infections, tuberculosis, brucellosis, malignancies, other immunological conditions and amyloidosis (10). We also mentioned nephrotic syndrome and hypothyroidism as possible causes of edema (10). These diagnoses were ruled out by a methodical approach including careful clinical examination, laboratory tests, serology, urinalysis, imaging and pericardial biopsy.

Childhood SLE should be kept in differentials if a patient presents with prolonged fever, peripheral edema, hemorrhagic syndrome, signs of pericardial effusion, or any unexplained organ involvement, to avoid delays in diagnosing and treating SLE, to improve long-term outcomes for adolescents, to prevent complications, to reduce disease activity and to improve the overall quality of life (10). Furthermore, those atypical presentations may need specific therapeutic strategies that should be reported to ensure an appropriate care and can lead to develop not only other innovative treatments but also innovative diagnostic techniques.

Conclusion

SLE is characterized by a major clinical polymorphism. Atypical initial presentations of children and adolescents should be reported by pediatricians. Thus, physicians would consider SLE in the differential diagnosis of many disorders such as peripheral cytopenia or an unexplained generalized edema. Moreover, further data are needed to participate in improving patient care, especially in emergencies like cardiac tamponade.

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