Acute pericarditis and transient erythroblastopenia associated with human parvovirus B19 infection

Parvovirüs B19 enfeksiyonu ile ilişkili akut perikardit ve geçici eritroblastopeni

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We report on an eight-year-old girl with acute pericarditis and transient erythroblastopenia associated with human parvovirus B19 (PVB19) infection. The patient presented with complaints of fever, chest pain, fatigue, and shortness of breath. On physical examination, she had tachycardia, hepatomegaly, and muffled heart sounds. Teleradiography exhibited cardiomegaly and echocardiography showed a pericardial effusion of 25 mm. Serum anti-PVB19 IgM and PVB19 DNA were positive. The patient developed anemia and reticulocytopenia in the second week, both of which persisted for two weeks then resolved spontaneously. At the end of three months, pericardial effusion resolved, hemoglobin and hematocrit levels were normal, and serum anti-PVB19 IgM was negative. This case represents the first report of acute pericarditis associated with PVB19 infection in a pediatric patient.

Key words: Anemia/virology; erythroblasts; parvovirus B19, human; pericarditis/virology.

Bu yazıda, insan parvovirus B19 (PVB19) enfeksiyonuyla ilişkili akut perikardit ve geçici eritroblastopeni tanısı konan sekiz yaşında bir kız hasta sunuldu. Hasta ateş, göğüs ağrısı, halsizlik ve nefes darlığı yakınmalarıyla başvurdu. Fizik muayenesinde taşikardi, hepatomegali ve derin kalp sesleri; teleröntgenografide kardiyomegali, ekokardiyografik incelemede ise 25 mm çapında perikart efüzyonu saptandı. Laboratuvar incelemelerinde serum anti-PVB19 IgM ve PVB19 DNA pozitif bulundu. İzlemin ikinci haftasında hastada iki hafta süren ve kendiliğinden düzelen anemi ve retikülositopeni gelişti. Üçüncü ayın sonunda perikat efüzyonu kayboldu, hemoglobin ve hematokrit değerleri normal, serum anti-PVB19 IgM negatif bulundu. Sunulan olgu, PVB19 enfeksiyonu ile ilişkili akut perikarditin çocuklarda bildirildiği ilk olgudur.

Anahtar sözcükler: Anemi/viroloji; eritroblast; parvovirüs B19, insan; perikardit/viroloji.

Viruses are responsible for the majority of infectious pericarditis cases among children.[1] While coxsackie B virus, echovirus, and adenovirus are the most frequent pathogens associated with this condition, other viruses such as influenza, mumps, varicella (VZV), human immunodeficiency virus (HIV), and Epstein-Barr virus (EBV) can be the underlying causes of pericarditis, as well.[1,2] Human parvovirus B19 (PVB19) infection is commonly encountered as the cause of erythema infectiosum (fifth disease); in some instances, it may lead to transient erythroblastopenia, symmetric polyarthropathy, fetal myocarditis, and hydrops fetalis.[3] Recently, cases of pericarditis,[4] perimyocarditis,[3] and pericarditis-related heart failure[5] associated with PVB19 infection have been reported in adult patients. In this report, we presented an eight-year-old girl who presented with acute pericarditis associated with PVB19 and developed transient erythroblastopenia-anemia in the follow-up period.

CASE REPORT

An eight-year-old girl presented with a 3-day history of fever, chest pain, fatigue, shortness of breath, and difficulty while lying down flat in the supine position. On physical examination, he had a weak appearance, increased temperature (38.3 °C), orthopnea, and a respiratory rate of 30/min. Her maximum heart rate was 144/min, blood pressure was 100/55 mmHg, and peripheral pulses were weak. Muffled heart sounds were auscultated and hepatomegaly of

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2 cm was noted. Other findings of physical examination were normal. Laboratory results were as follows: hemoglobin 12.1 g/dl, hematocrit 37.3%, red blood cells 4.94 x $10^6/\mu$l, white blood cells 19,700/mm^3 (48% lymphocyte, 40% neutrophil, 10% monocyte, 2% eosinophil), platelet count 470,000/mm^3, C-reactive protein 146 mg/l (normal <5 mg/l), and erythrocyte sedimentation rate 59 mm/h (normal <25 mm/h). Serum biochemistry showed normal levels of glucose, urea, creatinine, liver enzymes, electrolytes, creatinine kinase, troponin, and complement (C3 and C4). Teleradiography exhibited marked cardiomegaly (cardiothoracic ratio 70%) and electrocardiography showed ST-segment elevation. Echocardiography revealed pericardial effusion measuring 25 mm in diameter with a little amount of fibrin, normal systolic functions, and no signs of tamponade (Fig. 1). Thorax computed tomography was normal except for a marked pericardial effusion. Hemoculture, urinary and fecal cultures were negative. Tuberculin skin test, quantiFERON test, and culture of fasting gastric juice showed no signs of tuberculosis. Regarding involvement of collagen tissue diseases, antinuclear, anti-DNA, and anti-cardiolipin antibodies; rheumatoid factor, and gene analysis for familial Mediterranean fever were negative. Serum IgM antibodies for coxsackie virus, adenovirus, EBV, VZV, HIV, and mumps were found to be negative by ELISA. Serum anti-PVB19 IgM by ELISA and DNA analysis by polymerase chain reaction (PCR) yielded positive results. The patient developed paleness at the end of the second week at a time serial echocardiographic examinations demonstrated reduced pericardial effusion. Peripheral blood count analysis was as follows: hemoglobin 7.6 g/dl, hematocrit 24%, red blood cells 3.5 x $10^6/\mu$l, and reticulocyte 0.2%. There was no sign of hemolysis in the peripheral smear of the patient. Direct and indirect Coombs tests were negative and urinary and fecal tests were normal in terms of hemorrhage. Considering the findings suggestive of anemia without overt blood loss, but association with decreased production from the bone marrow, bone marrow aspiration was performed, which showed good cellularity overall, with absolute erythroid hypoplasia and absence of the more mature erythrocytes, and normal appearance and cellularity of the granulocytic and megakaryocytic lineages. Abrupt reductions in hemoglobin, hematocrit, erythroid mass, and reticulocyte values were thought to result from transient erythroblastopenia associated with PVB19 infection and the overall condition of the patient improved in two weeks. At the third month follow-up, pericardial effusion resolved, hemoglobin and hematocrit levels were normal, serum anti-PVB19 IgM was negative, and anti-PVB19 IgG was positive.

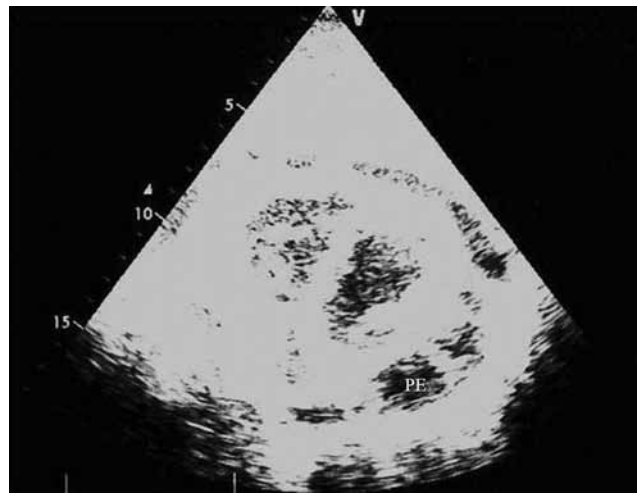

Figure 1. Two-dimensional echocardiogram showing a large pericardial effusion (PE).

DISCUSSION

Viral pericarditis is the second most common cause of pediatric pericarditis.[2] While all the enteroviruses may be responsible for this clinical condition, coxsackie B virus is the most frequent, and the disease may be caused by other viruses such as adenovirus, EBV, VZV, HIV, and mumps.[1,2,6] As patients with viral pericarditis most commonly present with fever and chest pain, they display a less toxic profile compared to patients with bacterial pericarditis. However, if myocarditis accompanies, which is the case in most of the patients with viral pericarditis, then clinical presentation may worsen.[2] In the present case, the main presenting symptoms were fever, chest pain, and fatigue. While PVB19 infection frequently causes benign and self-limited erythema infectiosum (fifth disease) in pediatric patients, less frequently, it may also lead to acute symptomatic polyarthropathy, fetal myocarditis, hydrops fetalis, aplastic crisis in those with hematological diseases, and anemia in patients with a suppressed immune system.[3,7] Occasionally, it may cause transient erythroblastopenia in normal children, as well.[8] The infection is usually diagnosed with clinical symptoms, serological tests, and by the detection of viral genome with PCR.[9] Pericarditis associated with PVB19 infection has also been reported in adults.[3-5] Orth et al.[3] reported a 34-year-old man who was diagnosed to have perimyocarditis associated with human PVB19 infection by showing anti-PVB19 IgM and IgG antibodies and viral DNA in the blood with PCR.

Richards and Johns[4] reported constrictive pericarditis with effusion in a patient presenting with fever and arthralgia associated with PVB19 infection. Seishima et al.[5] detected PVB19 infection in a 36-year-old male patient who presented with polyarthralgia, fatigue, and edema, and developed acute heart failure due to PVB19-induced pericarditis five days after admission. In our case, the patient presented with complaints of fever, chest pain, and fatigue and the diagnosis of pericarditis was established by clinical, electrocardiographic, and echocardiographic findings. Initially, bacterial and other viral pathogens, collagen tissue diseases, and malignancies were excluded. In the beginning, serum anti-PVB19 IgM and DNA analysis by PCR were positive, whereas in the follow-up examination, anti-PVB19 IgM became negative and IgG became positive. Moreover, in the second week of the follow-up, isolated anemia and reticulocytopenia developed, which resolved spontaneously in two weeks. The hematological profile was consistent with transient erythroblastopenia.

This case seems to be the first reported pediatric case of pericarditis due to PVB19 infection, but it is possible that this condition is underdiagnosed; therefore, PVB19 infection should be considered in the etiology of acute pericarditis in pediatric patients.

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