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Case Report

Infective Endocarditis: A Case with Prolonged Fever

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ABSTRACT

Infective endocarditis (IE) is associated with a high rate of mortality and morbidity in patients with anomalies of heart valves. We present a case of a 23-year-old male known to have severe mitral regurgitation (MR) with a history of prolonged fever for 5 months. According to The Modified Duke Criteria, clinical sign and symptoms fulfilled one major criterion (echocardiography finding of vegetation on mitral valve) and three minor (fever of at least 38^0 Celsius, valvular heart disease as a predisposing heart condition, and positive blood culture for *Lactococcus sp. and Pediococcus sp*.) considered as definite IE. Fever is one of the most common symptoms of IE (>90% of cases). Patient with prolonged fever and structural abnormality of heart valve should be considered for acute or subacute of IE. Establishing an diagnosis of IE and appropriate antibiotic therapy will improve the patient's clinical condition, and reduce morbidity and mortality.

Introduction

Infective endocarditis (IE) is an acute or subacute endocardial infection caused by bacterial, viral, or fungal microorganisms. It is also associated with high rate of mortality and morbidity in patients suffering from heart valves anomalies [1]. Prolonged fever with unknown origin should be considered a sign and symptom of IE. The first step in the diagnosis of IE is to identify risk factors including prosthetic heart valves, structural cardiac anomalies or congenital, intravenous drug users, and recent invasive procedures. The Modified Duke criteria, that are currently widely used, consist of clinical, laboratory, and echocardiographic findings [2]. We report a case of an IE patient with known severe mitral regurgitation (MR) and moderate aortic regurgitation (AR) presented with prolonged fever. We wante to highlight the importance of echocardiography to diagnose IE.

Case Presentation

A 23-year-old man was referred to an emergency room with dyspnea and five months history of intermittent fever. The intermittent fever with temperatures above 38^o C, was slightly decreased by the administer of antipyretic agents. Previously, he had been consulted to the tropical and infectious diseases division of internal medicine department. Dyspnea was felt to worsen since the last week. He suffered from loss of appetite and nausea within last week. The patient had just found that he had a

valve heart disease based on an examination at a referral hospital.

On admission, the patient was compos mentis and febrile with axillae temperature was 38.4^0 C; blood pressure 110/70 mmHg; heart rate 110 bpm; the respiratory rate of 26 breaths per minute; and saturation of 98% on room air. From the physical examination, there was an elevated jugular venous pressure. Diminished percussion sound of cardiac waist indicates widening of left heart border. Regular heart sound with soft second heart sound, distinct grade IV/VI pan-systolic murmur best heard at the apex which radiated to the left axillae with the same intensity. A grade II/IV diastolic murmur best heard at the second intercostal space parasternal line dextra.

The auscultation of his lungs was clear bilaterally, and his abdomen was soft, non-distended, and non-tender without hepatosplenomegaly. He had a normal dentition with no tooth decay. He had no skin rash or petechiae.

The blood test showed an elevated white blood cell (WBC) count of 14,230/mm3 with neutrophilia 84.6%. C-reactive protein (CRP) as an inflammatory marker increases at the level of 55.06 mg/dl. Urinalysis revealed a normal urine test. The serum immunological investigation for HIV, HBV, ANA was found to be negative. Blood cultures collected from three locations of puncture at 30 minutes intervals grew *Lactococcus lactis ssp horniae* from the right arm, *Pediococcus pentosaceus* from the left arm, and *Lactococcus lactis ssp cremoris* from the right femoral. All showed high sensitivity to ceftriaxone. ECG showed sinus rhythm 100 beats per minute, normal frontal axis and counterclockwise rotation on the horizontal axis. Chest X-ray showed cardiomegaly with mitral heart configuration with cardiothoracic ratio (CTR) of 65% (Figure 1).

Figure 1. Chest X-ray showed cardiomegaly with mitral heart configuration, cardiothoracic ratio of 65%.

Transthoracic echocardiography (TTE) revealed severe MR due to prolapse of the anterior mitral leaflet (AML) with a 1.9 cm x 1.1 cm vegetation (Figures 2 and 3), moderate AR, and mild pulmonic regurgitation (PR). Evaluation of the chamber from TTE showed left atrial and ventricle dilation (ejection fraction 62%). The result of TTE was confirmed by transesophageal echocardiography (TEE) which found severe MR due to A2 segment prolapse (Figure 4) with a 0.9 cm x 0.4 cm vegetation and a 1.2 cm x 1.0 cm vegetation on P2 segment (Figure 5), moderate AR (qualitative) with a 0.7 cm x 0.6 cm vegetation (Figure 6), and mild tricuspid regurgitation (TR).

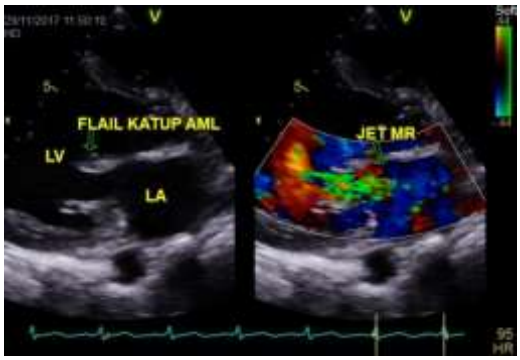

Figure 2. Transthoracic echocardiography (TTE) revealed severe MR due to prolapse of the anterior mitral leaflet (AML)

Figure 3. Transthoracic echocardiography (TTE) showed vegetation on anterior mitral leaflet (AML)

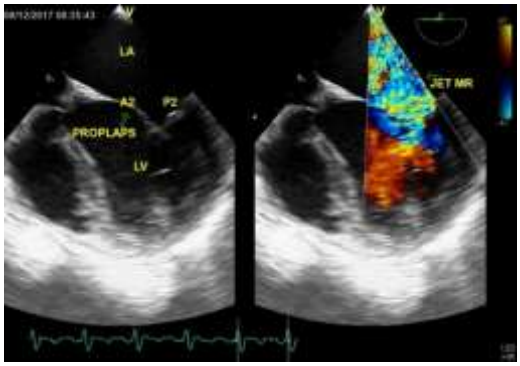

Figure 4. Transoesophageal echocardiography (TEE) showed severe mitral regurgitation (MR) due to A2 segment prolapse

Figure 5. Transoesophageal echocardiography (TEE) showed vegetation on A2 and P2 segment of anterior mitral leaflet (AML)

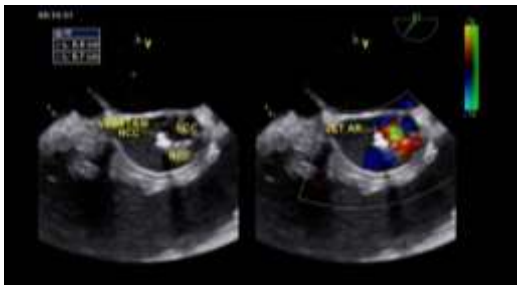

Figure 6. Transoesophageal echocardiography (TEE) showed moderate aorta regurgitation (AR) (qualitative) with vegetation

Based on the modified Duke's criteria, clinical sign and symptoms of patient fulfill one major and three minor for the clinical diagnosis of infectious endocarditis. We diagnosed patients with definite infective endocarditis, severe MR, moderate AR, and preserved heart failure. The patient was treated with 2 grams of ceftriaxone (antibiotic) twice daily for 30 days, 20 milligrams of furosemide three times daily, along with lisinopril 5 milligrams once daily and bisoprolol 2.5 milligrams once daily for valvular heart disease management.

The fever subsided within two weeks after antibiotics therapy. During the following days, the inflammation markers improved (CRP 0.8 mg/dL, and WBC 9.310/mm3), but we found the elevation of SGOT 265 µ/L and SGPT 405 µ/L, the ultrasound of the abdomen was normal. At 30 days of ceftriaxone therapy, blood culture was taken and the result was sterile. Elevated liver enzymes improved with heart failure therapy and discontinuation of hepatotoxic drugs such as paracetamol.

After undergoing a whole series of therapies, the patient was discharged and planned for elective double valve replacement surgery. Within two months, he performed double valve replacement surgery using a mechanical prosthetic mitral valve (On-X Valve 31/33 mm) and mechanical prosthetic aortic valve (On-X Valve 23 mm). Surgical results show vegetation in the mitral and aortic, according to the results of the previous TEE. The patient received oral anticoagulant therapy, i.e. warfarin 4 milligrams at night with a target of the INR 2.5 - 3.5.

Discussion

Chronic intermittent fever is a condition that challenges the diagnosis process. The prevalence of prolonged fever in hospitalized adult patients is about 2.9% [3]. In adult, there are several dozen possible causes as a differential diagnosis. The most common of differential diagnosis include infection (20-40%), malignancy (20-30%), non-infectious inflammatory responses (10-30%), and other causes (10-20%) [4,5]. In this case, prolonged fever in patients with predisposing heart conditions (valvular heart disease) is considered as acute or subacute infective endocarditis. Infective endocarditis has high morbidity and sometimes fatal infection if the diagnosis is not achieved even though medical therapy is advanced.

Patients with suspected IE must undergo TTE examination as an imaging modality according to the recommendations of the American Heart Association (AHA) and the European Society of Cardiology (ESC) 2015 [6,7]. TTE is a non-invasive diagnostic imaging modality with a sensitivity between 44% to 70% for the detection of native valve vegetation. The detection rate for vegetations by TTE in patients with a clinical suspicion of endocarditis is about 50%. Vegetation size also affects TTE sensitivity since only 25% of vegetation < 5 mm and 70% of 6-10 mm are identified TEE has greater sensitivity for detecting infective endocarditis [8]. The sensitivity of TEE is more than 90% for native valve vegetation and 90% for paravalvular abscess. The specificity of TTE and TEE is similar and greater than 90% [6]. In our case, severe MR with vegetation on the anterior mitral valve had been confirmed using TTE. According to ESC guidelines 2015, TEE should be performed if we found vegetation using TTE [6]. In our case, TEE was performed, it showed multiple vegetations on A2 and P2 segment of the mitral valve, and on non-coronary cusps of the aortic valve.

The current criterion for clinical diagnosis of IE is the Modified Duke Criteria which consists of the main, minor and pathological criteria for classifying

endocarditis as definite, possible or rejected. [6] In this case, we diagnosed patients with definite IE because clinically the patient fulfilled one major criterion (echocardiography findings of vegetation on mitral and aortic valve) and three minor (fever of at least 38^0 Celsius, valvular heart disease as a predisposing heart condition, and positive blood culture for Lactococcus sp. and Pediococcus sp.). Lactococcal IE is a very rare case. In the literature, only a few cases exist in adults and fewer cases in children or infants. [9,10]

Successful treatment of infective endocarditis requires appropriate antibiotics. Antibiotics are the first choice depending on the severity of the symptoms that must be adjusted to the results of the culture. In this case, the patient was treated with antibiotic ceftriaxone according to the blood culture. After two weeks of antibiotic therapy, the fever subsided. Blood culture was sterile on day 30 of antibiotics. For definitive therapy of valvular heart disease and heart failure (HF) problem, the patient underwent double valve replacement surgery. ESC guidelines recommend that patients with aortic or mitral valve endocarditis with severe regurgitation or obstruction causing symptoms of HF should be performed urgent surgery. [6,7]

Conclusion

IE should always be suspected in febrile patients with predisposing heart disease. Diagnosis of IE needs to be considered in patients with prolonged fever of unknown origin with predisposing factors such as a history of valve heart disease. Physical examination, history, and knowledge of signs and symptoms of the disease can help to reduce the mortality and morbidity of IE. Vegetation finding on TTE and TEE, positive blood culture, and clinical features remain the basis of the diagnosis of IE. TTE is the first line choice of imaging modalities in patients with suspected IE. Positive vegetation on TTE should be confirmed with TEE. Blood culture must be taken to determine microorganisms and appropriate antibiotic therapy. The presence of structural abnormalities in the heart valve and complications of heart failure are important considerations for conducting valve replacement surgery.

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There is no conflict of interest.

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