

Native Valve Endocarditis in A Patient With Recurrent Infections – A Case Study

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Abstract

Native valve Endocarditis is a relatively uncommon yet potentially perilous condition often associated with pre-existing heart ailments. This particular case pertains to a 62-year-old man with no prior history of cardiac issues, who presented with symptoms including high fever, cough, and dyspnoea. Preceding his diagnosis, the patient had recently experienced typhoid (Salmonella typhi) and streptococcal infections. Physical examination revealed systolic murmurs and valve vegetations, subsequently confirmed through echocardiography and cardiac CT scan. Blood cultures detected Methicillin-Sensitive Staphylococcus aureus (MSSA), leading to the diagnosis of infective endocarditis using the modified Duke criteria. The patient's condition markedly improved following treatment with gentamicin and cefoperazone-sulbactam. This case underscores the importance of early identification and management of recurrent infections, even in the absence of common risk factors for infective endocarditis. Emphasis on preventive care and regular follow-ups is crucial to mitigate the risk of recurrence. A key factor in improving prognosis is early diagnosis through echocardiography and microbiological assessment, followed by tailored antimicrobial therapy. Regular follow-up, maintenance of oral hygiene, and adoption of a healthy lifestyle, including the avoidance of betel quid chewing, are imperative to minimize the likelihood of recurrence. Despite successful treatment, the risk of recurrence remains elevated, necessitating ongoing monitoring.

Keywords: Native Valve Endocarditis, Staphylococcus Aureus, Streptococci, Salmonella Typhi.

INTRODUCTION

Infective endocarditis (IE) is an intravascular infection that is defined as microbial invasion of the endocardium that lines the valves or chambers of the heart. Native valve infective endocarditis is uncommon with an incidence of approximately 2-10 cases per 100,000 annually.^[1] IE development on native tissue is understood to be initiated by inflammation or valvular endothelium damage, to which blood circulating pathogens adhere directly or indirectly by fibrin deposition to the activated endothelial layer.^[2] In the absence of an effective host response, bacteria replicate in situ, stimulating further platelet deposition to form an infected vegetation that is the hallmark of IE.

Staphylococci, streptococci, and enterococci bacterial species are estimated to account for approximately 80% of all cases.^[3] The clinical presentation of IE can easily

be missed. The diagnosis is made based on clinical, microbiological, and echocardiographic findings. The conventional standards that direct the diagnosis of IE are the modified Duke criteria.

This report describes IE with a particular focus on non-cardiac risk factors and aimed to investigate the clinical manifestations and diagnosis of IE in the older population, to improve treatment outcome.

Case Description

A 62-year-old male with no history of hypertension, diabetes mellitus or valvular disease presented to the emergency department with history of continuous high-grade fever, non-productive cough and grade 3 dyspnoea.

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Submitted: 10th February, 2024

Received: 14th March, 2024

Accepted: 12th May, 2024

Published: 21th June, 2024

Access This Article Online

Quick Response Code:



Website:
<https://jcrnst.com>

How to Cite This Article: Tasneem A, Alwal S, Junaid A. Native Valve Endocarditis in A Patient With Recurrent Infections – A Case Study. J Case Rep Med Stud Train. 2024;1(1):26-28

On clinical examination, the patient was febrile ($>38^{\circ}\text{C}$) and blood pressure was noted to be 140/90 mmHg with pansystolic murmurs in the mitral area.

Recent clinical history of the patient revealed a typhoid and a streptococcal infection 11 months and 6 months ago respectively. The patient described frequent continuous fevers over the past 11 months, relieved with paracetamol. Widal test titres 11 months ago revealed H and O antigens highly elevated at 1:320, confirming an active salmonella infection. Recent Widal test titres showed H antigens to be significantly elevated, indicating an anamnestic response. The patient was a chronic chewer of betel quid (paan) for more than 40 years, had a severe sore throat and was dependent on semi fluid foods during the active streptococcal infection. High ASO titre usually indicate a recent streptococcal infection.

ECG revealed left ventricular hypertrophy, atrial enlargement, and prolonged QT interval. Transthoracic echocardiogram revealed aortic and mitral valve vegetation, moderate aortic and tricuspid regurgitation, and mild pulmonary artery hypertension. These findings were subsequently confirmed with transoesophageal echocardiography.

The cardiac CT findings showed evidence of irregular linear hypodensities arising from mitral valve projection into the left ventricle, noted with a maximum thickness of 4mm, suggesting vegetation due to infective endocarditis (IE).

Baseline bloods showed haemoglobin of 8.9 g/dl, white cell count within normal limits and platelet count was normal. The blood cultures obtained using standard criteria revealed the presence of Methicillin Sensitive Staph Aureus (MSSA) sensitive to amikacin, gentamicin, ceftriaxone, vancomycin, cefoperazone & sulbactam and teicoplanin. The sensitivity was assessed by the Kirby-Bauer method using Mueller-Hinton agar. Thus, the diagnosis of IE was established using the modified Duke Criteria, which were based on two main criteria: vegetation shown on echocardiography and a positive culture for *Staphylococcus aureus*.^[2,4]

This patient was treated with a course of gentamicin 60 mg twice daily for 2 weeks and a combination of cefoperazone & sulbactam 1.5g twice daily for 6 weeks. The patient responded well to the above course of antibiotics with significant clinical recovery.



Figure 1: Vegetations on Mitral Valve.

DISCUSSION

This is an unusual instance of native valve endocarditis in a patient without any comorbidities.

Elderly patients are more prone to IE as older age is a significant risk factor that contributes to negative outcomes and complications demanding immediate medical attention. Risk factors for developing IE include cardiac risks such as degenerative valvular disease, congenital valvular abnormalities, rheumatic heart disease, post-cardiac transplant, and non-cardiac risks like chronic liver illness, bad dentition, older age, and intravenous drug usage.^[5] Our patient had IE without underlying valvular diseases or indwelling intravascular devices, and only a few of the non-cardiac risk factors, such as advanced age and poor dental health, were present. IE presents sub acutely with nonspecific symptoms such as fever, malaise, chills, sweats, dyspnoea, back pain, arthralgias, and weight loss over a period of weeks or sometimes months.^[2,3] The Modified Duke criteria is the standard criteria providing framework for diagnosis of IE. The sensitivity of the criteria is estimated to be around 80% for definite cases.^[2] Echocardiography is an essential tool in the diagnosis and management of IE. The sensitivity for detection of vegetations in native valve IE is 50-60% with transthoracic echocardiography (TTE) and 90% with transoesophageal echocardiography (TOE). One of the major Duke criteria is confirmed by blood cultures, which are the most significant microbiological testing for identification and cure of IE.^[2,3] Antimicrobial therapy largely depends on the blood culture isolate and its antimicrobial susceptibility. Approximately 90-95% of cases of native valve IE are blood culture positive.

An anamnestic reaction is a type of defensive response that happens when the immune system produces antibodies that are specific to an antigen, which can be an invading substance like a bacteria, fungus, or virus.^[2] However, in diseases such as typhoid these antibodies may rise with other infections such as malaria and other fevers. If an individual had a previous attack of enteric fever, the H antibody titre rises rapidly with non-typhoid fevers, but the titre of O antibodies does not rise. Hence, High anti-H and low anti-O suggest anamnestic reaction.

The mean duration of antibiotic therapy is 5-6 weeks, and it is possible to obtain similar therapeutic results within two weeks of therapy, especially in uncomplicated native valve endocarditis. Three quarters of embolism occurs before the beginning of antibiotic treatment and the embolic risk decreases over time, from 15% after one week of treatment to 1% after 4 weeks.^[6] The use of anticoagulants is not indicated for patients with endocarditis because of the risk of haemorrhagic neurological events.^[6]

Prompt diagnosis and multidisciplinary approach are crucial for improving outcome in patients with native valve infective endocarditis. Sometimes, considerations for surgical repair should be discussed with cardiothoracic surgeons and weighed against the chances of reinfection and long-term benefits.

Although most cases of infective endocarditis can be cured with either medical therapy or combined medical and surgical therapy, the lifetime risk of a second episode of IE has been estimated to be between 2% - 22%.^[7] The global intra-hospital mortality of IE is 20% and reaches 40% after one year of follow-up mostly related to complications.^[8] Hence, regular follow ups and preventive care like refraining from betel quid, maintenance of oral hygiene, and a proper diet plan is recommended.

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