

Case Report

The first case of prosthetic valve endocarditis due to *Salmonella enterica* Serovar Enteritidis infection in Sri Lanka

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Abstract

Prosthetic valve replacement is one of the predisposing factors for the development of infective endocarditis. Prosthetic valve infective endocarditis caused by non typhoidal *Salmonellae* is an uncommon manifestation. We report a case of a female patient with a history of bioprosthetic aortic valve replacement admitted due to prolonged fever with diarrhoea. The echocardiogram revealed a prosthetic valve vegetation with the etiological diagnosis of infective endocarditis by *Salmonella enterica* Serovar Enteritidis. She had a fulminant clinical course and died after 6 months despite prolonged antibiotic treatment.

Key wards: Prosthetic valve endocarditis, Salmonella enterica Serovar Enteritidis

Introduction

Prosthetic valve endocarditis (PVE) is caused by one or more infective vegetations occurring on mechanical or biological prosthesis. It can occur early, within a year after valve replacement or late, more than a year following valve replacement. The incidence of PVE is about 1% to 6% .¹ Although there is no significant difference in the risk of infective endocarditis (IE) in patients with mechanical valve or biological valve at the 5 year follow up, patients with mechanical valves have a greater risk in the first three months after surgery, while the risk is higher for bio-prostheses recipients one year or more after valve replacement .²

Salmonella is a facultatively anaerobic Gram negative bacterium of the family Enterobacteriaceae. *Salmonella* Enteritidis is a serovar belonging to *Salmonella enterica* subspecies enterica.. It usually causes self limiting gastroenteritis. The incidence of endocarditis caused by this species is very low. We report a case of PVE due to *Salmonella* Enteritidis, which, to the best of our knowledge, would be the first reported

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case published in Sri Lanka. The patient had fulminant clinical outcome and died after 6 months despite of treatment.

Case report

A 66-year old female from Jaffna with diabetes mellitus, bronchial asthma and severe aortic stenosis and underwent bio-prosthetic aortic valve replacement 7 years previously was admitted to Jaffna teaching hospital with intermittent fever of 7 days duration. Her fever was associated with chills, malaise, diarrhoea and nausea. On admission, she had high fever of 103 °C and was pale but not icteric. There were no signs of heart failure or any evidence of peripheral stigmata of infective endocarditis. Her pulse rate was 94/minute and blood pressure was 110/70 mmHg. Cardiac examination was normal but abdominal examination revealed a 2 cm non-tender hepatomegaly without splenomegaly.

Laboratory tests showed an elevated white cell count of 17,400/ μ L with neutrophils of 86.7%, haemoglobin of 9.2 g/dl, elevated ESR (80 mm/1 hr), elevated CRP (157 mg/L), and a raised AST (75 IU/L) and ALT (56 IU/L). Rheumatoid factor (< 8IU) and SAT were negative. Renal function, urine full report, chest radiograph and ECG were normal. Abdominal ultrasound scan showed mild hepatomegaly. Two of 3 blood cultures taken immediately after admission showed a growth of presumptive *Salmonella spp.* which was identified as *Salmonella* Enteritidis by the national reference laboratory for enteric bacteria at the Medical

Figure 2 Complications (White arrow) of extensive aortic valve endocarditis (Red arrow)

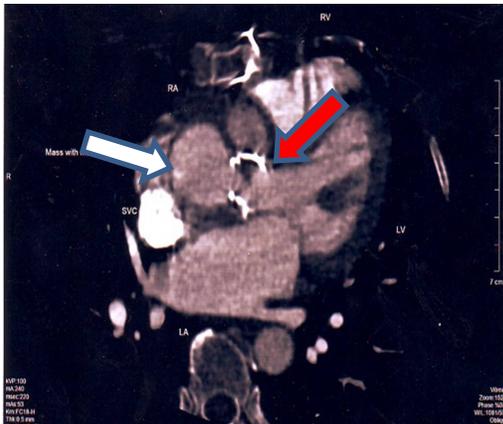
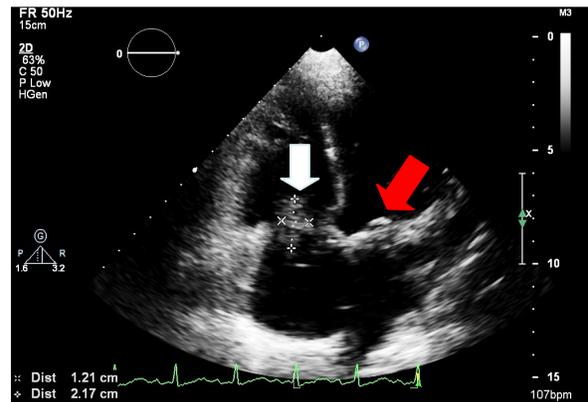


Figure 1: Vegetation in tricuspid valve (White arrow) which extended from aortic valve (Red arrow)



Research Institute, Colombo. Initial transthoracic echocardiography (TTE) and transoesophageal echocardiography (TOE) did not reveal valvular vegetations.

The patient was started on IV ceftriaxone 2g daily, based on available antibiotic sensitivity results. As the fever did not subside with antibiotics, although criteria of IE were not fulfilled, a strong clinical suspicion was raised. At this stage, one major criterion, a positive blood culture with only two minor criteria, fever and history of prosthetic heart valve replacement were present. Repeat TOE performed 2 weeks

after admission showed a 11×10mm vegetation close to the aortic valve, extending to the tricuspid valve.

The patient's fever settled after 16 days of antibiotics. However, although early surgery was indicated, and the patient advised appropriately, she refused surgery. After 7 days, a high grade fever reappeared and on patient request, she was transferred to a private hospital for surgery. Repeat TTE done at this time (6 weeks after onset of illness) showed that the tricuspid valve vegetation had increased in size to 21×12mm (Fig.1) Although as seen later in the CT angiogram, the vegetation originated from the aortic valve which could not be visualized by the TOE. A CT angiogram (Fig.2) showed extensive aortic valve endocarditis complicated with right ruptured sinus of valsalva, aneurysm and fistulous communication between left ventricular outflow track (LVOT) and right atrium.

The patient was retransferred to Jaffna Teaching Hospital for conservative management towards the 3rd month of her illness as the valvular and aortic damage was considered inoperable. Antibiotics were continued for another 3 months but the patient died despite prolonged antibiotic treatment after 6 months of illness.

Discussion

Nontyphoidal *Salmonella* are important foodborne pathogens and commonly causes self-limiting gastroenteritis. Bacteremia can occur in about 3%-8% of patients with gastroenteritis. Cardiovascular infections, including myocarditis and endocarditis are reported in 1%-5% of these patients.^{3,4} The pathogenesis of cardiac salmonellosis is related to the quantity of bacteria ingested, the strength of the host's immune response, the characteristic ability of *Salmonella* to adhere to damaged endothelium and the host's previous exposure. The sequelae of *Salmonella* endocarditis include valve perforation, valve ring abscess, atrioventricular wall perforation and cusp rupture, resulting in an estimated mortality rate of up to 75%.⁵

Risk factors for the development of PVE include age > 60 years, decreased gastric pH due to atrophic gastritis or excessive consumption of antacids, diabetes mellitus, neoplastic disease, decreased immunity (in patients with human immunodeficiency virus or systemic lupus erythematosus), immunosuppressive drug therapy, and bile duct disease.⁶ Age and diabetes mellitus were the risk factors in our patient.

If the TTE is normal in patients with prosthetic valves, TOE is mandatory when IE is clinically suspected. The sensitivity of TTE for <50% for PVE whereas it is 82-90% for TOE.⁷ We failed to detect IE before it induced extensive spread, which may be due to the 10-18% of insensitivity of TOE.

Salmonella endocarditis may present as a rapid, aggressive and fulminant course. Early surgical intervention is essential for some cases to prevent life-threatening complications.

Conflicts of interest

None

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