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# Tricuspid valve endocarditis due to *Salmonella typhi*

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**ABSTRACT** Salmonella typhi is a rare cause for infective endocarditis. Seventy five per cent of cases suffering from this condition have an underlying cardiac abnormality such as rheumatic heart disease or congenital heart defect. We report a case of native tricuspid valve endocarditis due to *Salmonella typhi*. Organism was resistant to chloramphenicol, amoxycillin, moderately sensitive to ciprofloxacin and sensitive Ceftriaxone and Gentamicin. Patient improved with prolonged course of Ceftriaxone and Gentamicin therapy.

**KEYWORDS** salmonella typhi, tricuspid valve endocarditis

**LIST OF ABBREVIATIONS** Electrocardiogram (ECG)

**DECLARATION OF INTERESTS** KK Kadappu has received grants to attend conferences from Bristol-Myers.

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## CASE REPORT

A 40-year-old, previously healthy male bank attendant was admitted with fever and joint pain of three weeks' and a cough of one week's duration. At the onset of his illness, he had 4–5 episodes of watery diarrhoea. Fever initially responded to paracetamol and amoxicillin, but recurred again. He denied intravenous drug use.

On examination, the patient was febrile (101°F), pale and icteric. There were no clubbing, oedema, lymphadenopathy, cyanosis or stigma of infective endocarditis. His pulse rate was 98 beats per minute, regular and all peripheral pulses were palpable. The jugular venous pulse was normal. The abdomen was soft with enlargement of the liver and spleen.

Cardiovascular examination revealed dual heart sounds without any murmur or pericardial friction rub. Respiratory, nervous and musculoskeletal system examinations were unremarkable. There was no clinical evidence of pulmonary or systemic thromboembolism.

On examination, his urine, blood urea, electrolytes, chest X-ray and ECG were within normal limits. Thick and thin smears for malaria were negative. His haemoglobin was 92 gm/L, white cells $12x10^9$/L (leucocytes 54%, lymphocytes 41% and eosinophils 5%), bilirubin 36 IU, aspartate transaminase 79 IU, alanine transaminase 60 IU and alkaline phosphatase 370 IU. The patient declined to be tested for human immunodeficiency virus.

A provisional diagnosis of enteric fever was made and intravenous ciprofloxacin, 200 mg twice daily, was started. However, the patient's fever continued and, on the third day of admission, he developed a short systolic murmur in the tricuspid area. An echocardiogram with Doppler study revealed vegetation in the tricuspid valve (2·5 cm x 2 cm) with mild tricuspid regurgitation. (See Figure 1)

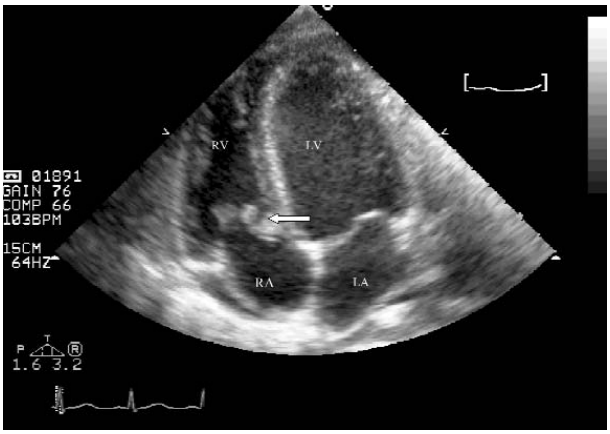


**FIGURE 1** RA – Right Atrium; RV – Right Ventricle; LA – Left Atrium; LV – Left Ventricle; Arrow showing the vegetation.

On the fifth day of admission, *Salmonella typhi* was grown from the blood culture which was resistant to amoxicillin and chloramphenicol, moderately sensitive to ciprofloxacin and sensitive to ceftriaxone and gentamicin. The antibiotic regimen was changed to ceftriaxone 2 gm twice daily and gentamicin 60 mg thrice daily for 14 days. Repeat blood cultures were negative. Gentamicin was stopped and ceftriaxone was continued for two more weeks. Echocardiogram at the end of four weeks of antibiotic therapy revealed thickened tricuspid valve leaflets without any vegetation.

## DISCUSSION

Infective endocarditis normally occurs in the setting of existing valvular abnormality, and *Salmonella typhi* accounts for 1·3–4·8% of cases.[1] Myocarditis, pericarditis and pulmonary emboli are common cardiopulmonary complications of enteric fever.[2] Echocardiogram is an essential and valuable investigation in enteric fever associated with a heart murmur, as *Salmonella* rarely can cause infective endocarditis.[3] Confirmation of endocarditis is important because these patients need long-term antibiotics for total eradication of the disease. Transthoracic echocardiogram is cheap, easily available and specific in diagnosing endocarditis.

The organism isolated from our patient was resistant to commonly used antibiotics such as amoxicillin and chloramphenicol. Resistance to multiple antibiotics has been increasing in isolates of *Salmonella typhi*[4] and is associated with poor prognosis.[5] However, our patient made an uneventful recovery after treatment with ceftriaxone and gentamicin. Long duration, high dose ceftriaxone (2–6 g per day for four to six weeks) with two weeks of aminoglycoside is the treatment of choice in multi-drug resistant *Salmonella* endocarditis.[1]

In summary, this is a rare case of *Salmonella typhi* native tricuspid valve endocarditis, diagnosed by transthoracic echocardiogram in a previously healthy male. Echocardiogram is the key investigation to confirm the diagnosis of endocarditis.

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## PAST PRESIDENTS

### *Sir Andrew Balfour (1639–1694)*

Balfour's claim to fame, apart from being the College's third President, is said by many to be his founding (and indeed its funding for the first few years) of the Physic Garden with his predecessor Sir Robert Sibbald (1641–1722). His fascination with botany had been nurtured in the Royal Gardens in Paris when he was a student there. When the Edinburgh Physic garden opened, it had more than 1,000 plants and species. It focused attention on botany, a knowledge of which was essential for any physician and, at the same time, supplied Edinburgh physicians with many of the plants they needed for their limited pharmacopoeia. Today's world famous Edinburgh Royal Botanical Garden is a worthy successor.

However, Balfour is said to have recognised another essential for anyone wanting to be skilled as a physician – a knowledge of human anatomy. The dissection of the human body had been forbidden at the time of the Reformation. Leonardo da Vinci (1452–1519) was among those who had been censured for performing dissections. The importance of dissection was recognised by many doctors, not least Vesalius, who published his treatise on human anatomy in 1543. Balfour is said to have fought for it to be given its rightful place in the Edinburgh medical curriculum, but if that is true, he did so more than 30 years before the Medical Faculty was founded! Was he campaigning on behalf of the surgeons?

Balfour studied medicine at St Andrews University, and also in London and France, graduating in Caen in 1661 before returning to practise in St Andrews and moving to Edinburgh in 1670.

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