

## TRICUSPID VALVE ENDOCARDITIS: NOT JUST IN IV DRUG ABUSERS

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### ABSTRACT

Tricuspid valve endocarditis affects Intravenous drug abusers without any pre-existing heart disease, similarly seen in immunodeficiency states, alcoholism, extensive burns, long standing indwelling right side catheters or intravenous cannulas and congenital heart diseases with left to right shunts. Right sided endocarditis accounts for 5% to 10% of all cases of infective endocarditis. It is less encountered due to lower rates of congenital and rheumatic heart disease affecting right side valves, lower right heart pressure and reduced stress to tricuspid and pulmonary valves and lower right heart blood oxygen content. Staphylococcus aureus is the most common organism isolated followed by Streptococcus pyogenes, Pseudomonas aeruginosa and candida species. Polymicrobial infections are common in IV drug addicts. The patient described here had post-partum septicaemia that predisposed her to Tricuspid Valve Endocarditis with septic pulmonary emboli which is an important complication of tricuspid valve endocarditis.

**KEY-WORDS:** Tricuspid Valve; Endocarditis; IV Drug Abusers

### Introduction

Tricuspid valve endocarditis (TVE) usually affects intravenous drug abusers without any pre-existing heart disease. Right sided endocarditis accounts for 5% to 10% of all cases of infective endocarditis and is less encountered than left sided endocarditis and this may be explained by the lower rates of congenital and rheumatic heart diseases affecting right side valves, lower right heart pressure with decreased stress to the tricuspid and pulmonary valves, and the lower right heart blood oxygen content.<sup>[1]</sup> Compared to left sided infective endocarditis, right side endocarditis has a relatively benign prognosis. More than 75% of these patients respond to medical treatment and only 20% to 25% require surgery.<sup>[2]</sup> Here, we describe a case of TVE occurring in the post-partum period associated with septic pulmonary emboli.

### Case Report

A 26 year old primigravida Euglycemic, Normotensive who developed high grade fever, 5 days after a full term normal vaginal delivery which was treated with antipyretics. Subsequently fever subsided immediately discharged her on the

7<sup>th</sup> postnatal day. One month later she presented with persistent high grade fever associated with progressive dyspnoea, productive cough and pleuritic chest pain of 20 days duration. No history of haemoptysis, pedal edema, smoking, alcohol intake or drug abuse. On admission, she was febrile, toxic orthopnoeic and pale, with a pulse rate of 120 beats per minute, blood pressure of 120/70 mmHg. Respiratory system examination revealed bilateral crepitation in lower lobe areas. Cardiovascular system examination revealed a short systolic murmur grade 2/6 heard in left sternal border which was attributed secondary to hyperdynamic flow secondary to fever or anaemia. She had no ascites, hepatosplenomegaly, or features suggest of deep vein thrombosis of lower limbs. Complete blood count revealed microcytic hypochromic anaemia with leucocytosis with sterile sputum culture. Her chest x-ray revealed bilateral lower zone patchy opacities (Figure-1). She was initiated on beta-lactam antibiotics and macrolides with a provisional diagnosis of bilateral pneumonia. Subsequently her fever subsided but tachycardia and breathlessness persisted. After 7 days of oral antibiotic treatment, repeat chest X-ray revealed no signs of resolution of opacities. In view of persistent tachycardia and dyspnoea with an

increase grade of murmur grade 4/6 echocardiogram was done which revealed dilated right side chambers and highly mobile vegetation attached to the posterior tricuspid leaflet which was confirmed by Transesophageal Echocardiogram (TEE) (Figure-2). There was moderate to severe tricuspid regurgitation with a pulmonary artery systolic pressure of 40 mmHg. Based on the above findings, she was diagnosed as tricuspid valve endocarditis with septic pulmonary emboli. Immediately 3 blood cultures were sent 1 hour apart from 3 different sites followed by initiation of third generation cephalosporins and aminoglycosides.

Ceftriaxone and Piperacillin-Tazobactam and resistant to Amikacin, Gentamicin and Cotrimoxazole.

After 7 days of treatment with Ceftriaxone, her repeat chest X-ray (Figure-3) showed resolution of opacities and symptomatic improvement. Repeat Echocardiogram (Figure-4) showed no obvious increase in vegetations with moderate to severe tricuspid regurgitation, dilated right side chambers, flail posterior tricuspid leaflet with a pulmonary artery systolic pressure of 34 mmHg. She was given IV antibiotics for a period of four weeks and repeat cultures were sterile. Meanwhile patient showed marked improvement symptomatically. Repeat Echocardiogram after 2 months revealed small healed vegetations with flail posterior tricuspid leaflets with moderate to severe tricuspid regurgitation with pulmonary artery systolic pressure of 36 mmHg.

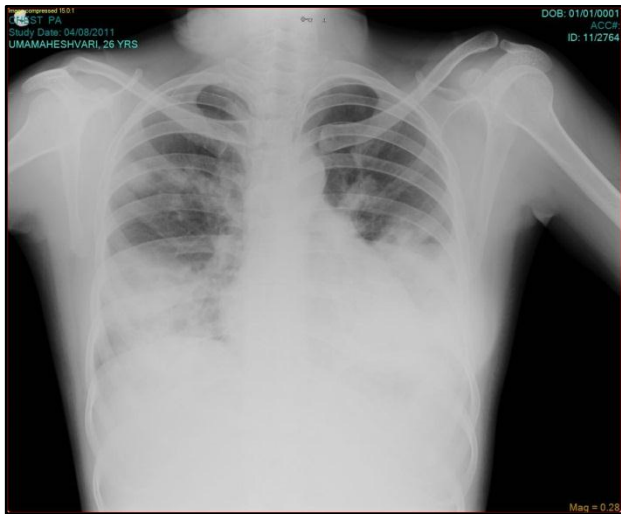


Figure-1: Chest X-Ray on Admission

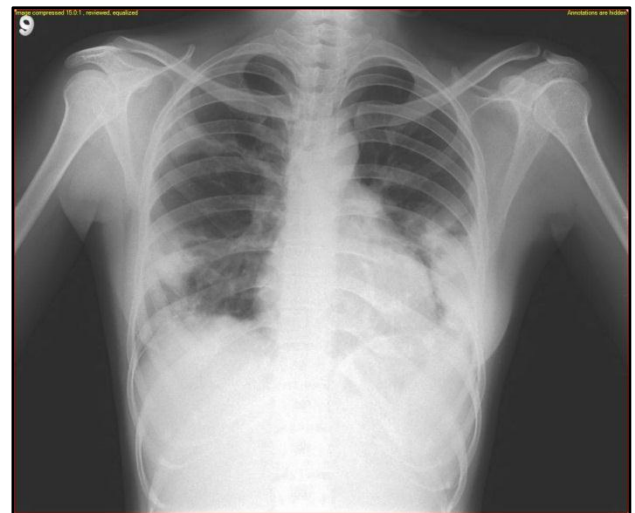


Figure-3: Chest X Ray during Treatment

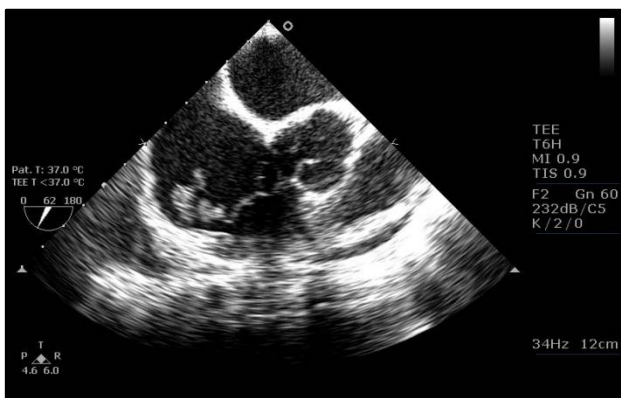


Figure-2: ECHO on Admission



Figure-4: ECHO during Resolution

Blood samples were inoculated in to Brain-heart infusion broth and incubated at 37°C and it grew *Pseudomonas aeruginosa* using the conventional tests.<sup>[3]</sup> Out of 3 blood cultures, two culture grew *Pseudomonas aeruginosa*.

The antibiotic susceptibility tests were done by Kirby -Bauer disk diffusion method according to CLSI guidelines<sup>[4]</sup> using commercially available disks. The isolate was sensitive to Imipenem,

## Discussion

Our patient, a non-drug abuser with normal tricuspid valve had TVE with septic pulmonary

embolization. Even though TVE is a usually a disease of drug abusers, other conditions like immunodeficiency states, alcoholism, extensive burns, longstanding indwelling right side catheters or Intravenous cannulas, and congenital heart diseases with left to right shunts can give rise to TVE.<sup>[5,6]</sup> Highly virulent *Staphylococcus aureus* is the most common organism isolated in TVE (50% to 80%).<sup>[1]</sup> *Streptococcus*, *Pseudomonas aeruginosa*, and *candida* are also frequently isolated, with polymicrobial infections being more common in drug addicts. In this case the fact that two out of three blood cultures grew *Pseudomonas aeruginosa*, it is less likely to be contaminant in the background of our patient's clinical picture. Even though azithromycin and co-amoxiclav was given to the patient, *Pseudomonas aeruginosa* was still grown on blood culture, as these antibiotics were not antipseudomonal.

Our patient had postpartum septicaemia that predisposed her to TVE. She had received multiple parenteral injections through the long standing indwelling intravenous cannula which might have led to the seeding on the tricuspid valve, similar to that of a drug abuser. The pleuritic chest pain and the progressing dyspnoea were probably due to the septic emboli from the vegetation into the pulmonary vasculature. Pneumonia or septic pulmonary embolism secondary to septic embolization are both common. Cardiac manifestations in TVE are few. Generally, pleuropneumonic symptoms rather than right heart failure are more common in TVE, as in this case. Patient presenting with signs and symptoms of right heart failure indicates a poor prognosis. Pulmonary embolism is an important complication of TVE and emboli may continue to occur despite successful eradication of infection.<sup>[7]</sup> The diagnosis of pulmonary embolism was provided by radiography, electrocardiography, echocardiography and ventilation-perfusion scan/Spiral CT chest.

Echocardiography is a very important investigation tool, which can detect valvular vegetations in approximately 80% to 100% of patients with endocarditis.<sup>[8]</sup> TVE has a better prognosis and less frequently requires surgical intervention. Severe congestive heart failure and persistent sepsis along with increasing vegetation

size are major indications for surgery. A study by Robbins et al.<sup>[9]</sup> states that patients who had right side infective endocarditis with vegetations of less than 1.0 cm on echocardiogram did not require surgery, whereas those with vegetations of 1.0 cm or more requires surgery with persistent fever.

Robbin et al.<sup>[9]</sup> suggested major and minor criteria for the diagnosis of TVE. The suggested major criteria were vegetations demonstrable on echocardiography associated with fever. The minor criteria comprised of multiple positive blood cultures, evidence of septic pulmonary emboli, absence of systemic emboli, and a murmur compatible with tricuspid involvement.<sup>[9]</sup> Either 2 major or one major and 3 minor criteria must be met to establish the diagnosis of TVE. The sensitivity and specificity of these criteria have not been established.

## Conclusion

Postpartum TVE is a rare condition. But despite this fact, it strongly emphasizes the need and importance of blood cultures and echocardiography in postpartum patients with persistent fever and in those patients with multiple IV lines and intravenous injections who continue to have persistent fever despite ruling out all the usual causes of fever. This case re-emphasizes the need for meticulous care of insertion of IV cannulas and their subsequent care.

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