

CASE REPORT

A CASE OF RIGHT SIDED INFECTIVE ENDOCARDITIS WITH REACTIVE KNEE ARTHRITIS AND ACUTE KIDNEY INJURY

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ABSTRACT: Right-sided infective endocarditis (RSIE) occupies 5% of infective endocarditis (IE). Here we present a 42 year old male who presented to us with the complaints of fever, bilateral knee swellings, loss of appetite, weight loss and decreased urine output for one month. Patient had pan systolic murmur in the tricuspid area with basal crepitation. 2D ECHO showed mass in the tricuspid leaflet protruding into the right atrium with severe tricuspid regurgitation. His renal parameters were elevated and blood culture was positive for coagulase negative staphylococ ci. The patient was diagnosed as right sided infective endocarditis with reactive knee arthritis and acute kidney injury.

INTRODUCTION: Infective endocarditis (IE) involves the aortic valve most commonly, the mitral valve is second valve most commonly involved while tricuspid and pulmonary valves are least commonly involved. Multiple valve involvements are usually seen in 17-22% of the patients. Infection localized to the right heart valves occurs in about 5% of cases of infective endocarditis. In the western countries this disease is seen mainly in injection drug abusers and as a complication of indwelling catheters in the subclavian vein. In spite of the high prevalence of rheumatic heart disease in our environment the right sided infective endocarditis of the heart is a rare presentation. The diagnosis is rendered more difficult when signs of left heart disease overshadow that of the right side. And also there have been only scant reports of right-sided infective endocarditis (RSIE). This article deals with the use of two dimensional echocardiography in the diagnosis of RSIE in a population in which rheumatic heart disease is more common and intravenous drug abuse uncommon.

CASE REPORT: A 42 years old gentleman, tailor presented with the complaints of high grade fever with chills and rigor for one month. He also complained of bilateral knee joint swelling with pain and restricted movements. Patient also had decreased urine output, b/l leg swellings, loss of appetite and weight loss. He had jaundice one month ago. Patient is a smoker and alcoholic, no history of drug addiction. Patient was treated as CKD at a PHC and came here for further management.

ON EXAMINATION: Patient is conscious and oriented, thin built and poorly nourished. He is pale with bilateral pitting pedal edema. Bilateral knee joint swelling with warmth and tenderness present. His pulse is 80 beats/min, normal rhythm and volume, BP normal. On auscultation S1S2 present, a pan systolic murmur was heard in the tricuspid area. The respiratory rate 20/min and there was bilateral fine basal crepitations. Abdomen soft, no organomegaly and CNS intact.

The patient was admitted with working diagnosis of 1) Acute kidney injury/bilateral reactive arthritis, 2) Acute rheumatic fever and 3) Infective endocarditis and evaluated.

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Investigations	Patient value	Normal value
Haemoglobin	8.6g%	14-16g%
WBC count	10600/cu mm	4000-10000
Platelet	3.5 lakh/cu mm	1.5 to 4.0 lakh

Table 1: Haemogram

Investigations	Patient value	Normal value
RBS	123mg/dl	70-140
Urea	97mg/dl	15-40
Creatinine	2.6mg/dl	0.6-1.0
Sodium	130 mmol/l	135-145
Potassium	4.2 mmol/l	3.5-5.0
Chloride	92 mmol/l	95-105
Bicarbonate	24 mmol/l	22-28

Table 2: RFT & Electrolytes

Investigations	Patient value	Normal value
Bilirubin (t)	0.9 mg/dl	0.2-1.1
Bilirubin (d)	0.3 mg/dl	Upto 0.3
SGOT	41 IU/l	5-37
SGPT	37 IU/L	5-50
ALP	156 IU/L	80-306
Protein	5.8g/dl	6.6-8.7
Albumin	2.8 g/dl	3.5-5.1

Table 3: Liver function tests

Investigations	Patient value	Normal value
Uric acid	3.0 mg/dl	3.5-5.5
Calcium	9.3 mg/dl	9-11
Phosphorus	3.6 mg/dl	2.5-5.0
RA factor	8 IU/L	<8
A.S.L.O	200 IU/L	<200
CRP	1.2 mg/dl	<1.2

Table 4: Other Investigations

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URINE EXAMINATION:

Sugar – nil.
Albumin - +.
Pus cells – plenty.
Spot sodium - 47Meq/L.
Spot protein - 46.7 mg/l.
24 hour urinary protein- 1120 mg/day.

VIRAL MARKERS:

HIV I and II – negative.
HbsAg – negative.
HCV – negative.

SYNOVIAL FLUID: C/S – No growth.

ECG: Normal sinus rhythm, within normal limits.

USG Abdomen- Grade I medical renal disease.

Rt. kidney – 12.3 X 4.8 cm.
Lt. Kidney – 12.0 X 4.5 cm.

BLOOD CULTURE:

1 – Coagulase negative staphylococci (moderate growth)
2 – Contamination
3 – Coagulase negative staphylococci (moderate growth)
HACEK/FUNGAL – No growth.
Review Blood culture – Heavy growth of staphylococcus aureus.

Figure 1: 2D -ECHO - Parasternal long axis view showing normal sized aorta, left atrium, left ventricle and normal mitral valve.

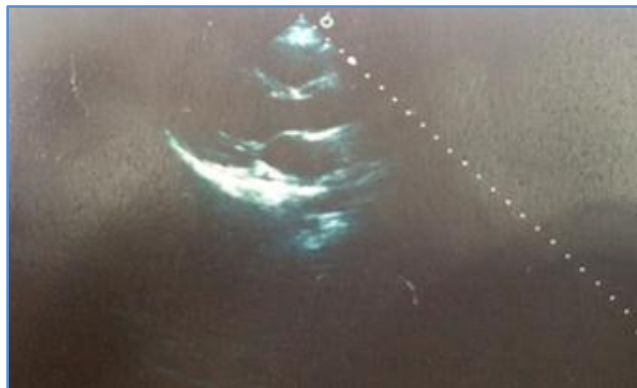


Figure 1

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Figure 2: 2D-ECHO - Apical four chamber view showing dilated right atrium and right ventricle with a mass vegetation in the atrial surface of the tricuspid valve protruding into the right atrium.



Figure 2

Figure 3: 2D- ECHO -Apical 4chamber view with colour Doppler showing severe tricuspid regurgitation.

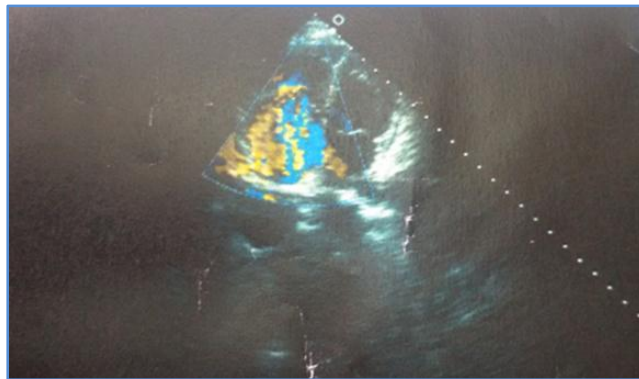


Figure 3

Figure 4: 2D- ECHO- with colour doppler showing severe tricuspid regurgitation.

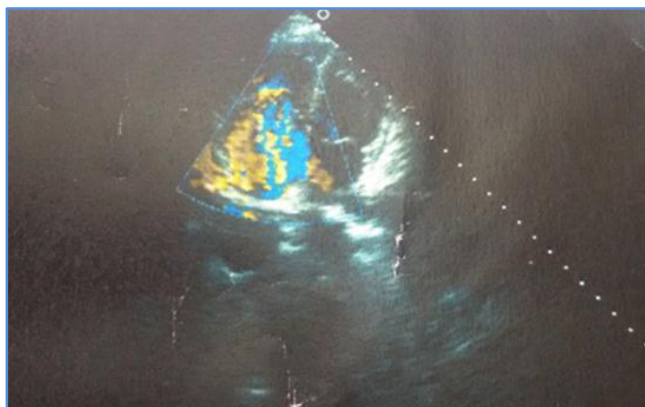


Figure 4

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2D ECHO REPORT:

RA, RV mildly dilated;
 Mass vegetation attached to the atrial surface of the tricuspid leaflet prolapsing into RA.
 With Severe Tricuspid Regurgitation (+).
 Impaired diastolic function.

TREATMENT: The patient was treated with iv antibiotics- Inj. CEFTRIAXONE 2g iv BD for 2weeks and other supportive measures were given. The patient gradually improved and was discharged after 20days of hospitalization.

DISCUSSION: INFECTIVE ENDOCARDITIS (IE) involves the aortic valve the most commonly, the mitral valve second most commonly and infection localized to the right heart valves occurs in about 5% of cases of infective endocarditis. This disease is seen mainly in drug abusers and as a complication of indwelling catheters in the subclavian vein, and among injection drug users, commonly the tricuspid valve is involved and commonly caused by staphylococcus aureus, of which many strains are methicillin resistant.

Staphylococcus aureus has become the most common microorganism of Infective Endocarditis, while incidence of streptococcus viridians infections has reduced. Among IV drug abusers, group A streptococci have caused tricuspid valve IE similar to that noted with staphylococcus aureus. Other causative organisms are, pseudomonas aeruginosa, candida species and sporadically by unusual organisms such as bacillus, lactobacillus and corynebacterium species.

The clinical manifestations of IE in depend on the valves involved and infecting organism. The symptoms include Pleuritic chest pain, breathlessness, cough, and haemoptysis occur with tricuspid valve endocarditis, particularly when it is caused by staphylococcus aureus. In 65% to 75% of patients, chest radiograph reveals abnormalities related to septic pulmonary emboli. Murmurs of tricuspid regurgitation are noted in less than half of these patients. Infection of the aortic or mitral valve in addicts clinically resembles IE seen in patients who are not drug abusers. HIV infection has been noted in 27% to 73% of IV drug abusers with IE.

Organism	Percentage of cases- Native valve endocarditis		Percentage of cases of prosthetic valve endocarditis- months of onset after valve surgery			Endocarditis in injection drug users		
	Community-acquired (n-1718)	Health care associated (n-788)	<2months (n-144)	2-12 months (n-31)	>12 months (n-194)	Right sided (n-346)	Left sided (n-204)	Total (n-675)
Streptococci	40	9	1	9	31	5	15	12
Pneumococci	2	-	-	-	-	-	-	-
Enterococci	9	13	8	12	11	2	24	9
Staph.aureus	26	53	22	12	18	77	23	57
Coagulase -ve staphylococci	5	12	33	32	11	-	-	-
Fastidious gram-ve cocco Bacilli HACEKgroup	3	-	-	-	-	-	-	-

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Gram -ve bacilli	1	2	13	3	6	5	13	7
Candida spp	<1	2	8	12	1	-	12	4
Polymicrobial	3	4	3	6	5	8	10	7
Diphtheria	-	<1	6	-	3	-	-	0.1
Culture -ve	9	5	5	6	8	3	3	3

Table 5

DIAGNOSIS OF INFECTIVE ENDOCARDITIS:

MAJOR CRITERIA: Positive blood culture.

- 1) Typical microorganism for infective endocarditis from two separate blood cultures.
 - i) Viridians streptococci, Streptococcus gallolyticus, HACEK group, Staphylococcus aureus, or
 - ii) Community-acquired enterococci in the absence of a primary focus, or
 - Persistently positive blood culture, defined as recovery of a microorganism consistent with infective endocarditis from blood cultures drawn >12 h apart; or all of 3 or a majority of 4 separate blood cultures, with first and last drawn at least 1 h apart or single positive blood culture for Coxiella burnetii or phase I IgG antibody titer of >1:800
 - Evidence of endocardial involvement.
- 2) Positive echocardiogram - Oscillating intracardiac mass on valve or supporting structures or in the path of regurgitant jets or in implanted material, in the absence of an alternative anatomic explanation, or abscess, or new partial dehiscence of prosthetic valve, or new valvular regurgitation (increase or change in preexisting murmur not sufficient).

MINOR CRITERIA:

- 1) Predisposing heart condition or injection drug use.
 - 2) Fever 38.0°C (100.4°F).
 - 3) Vascular phenomena: major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial haemorrhage, conjunctival haemorrhages, Janeway lesions.
 - 4) Immunologic phenomena: glomerulonephritis, Osler's nodes, Roth's spots, rheumatoid factor.
 - 5) Microbiologic evidence: positive blood culture but not meeting major criterion as noted previously or serologic evidence of active infection with organism consistent with infective endocarditis
 - 6) Echo: consistent with endocarditis but do not meet a major criterion as noted above.
- Infective endocarditis is diagnosed by the documentation of two major criteria, or one major and three minor criteria, or five minor criteria.

INVESTIGATIONS:

- Blood culture.
- Non- blood culture tests.
 - a) Serologic tests.
 - b) Culture in vegetations.

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- c) Microscopic examination with special stains (Periodic Acid – Schiff for Tropheryma whipplei).
- d) PCR to recover unique microbial DNA.

IMAGING MODALITIES USED IN INFECTIVE ENDOCARDITIS:

- Trans thoracic echocardiography (TTE) is non-invasive and exceptionally specific, it cannot image vegetations <2 mm in diameter, TTE detects vegetations in only 65% of patients with definite clinical endocarditis.
- Trans esophageal echocardiography (TEE) is safe and detects vegetations in >90% of patients with definite endocarditis; TEE is the optimal method for the diagnosis of pulmonary valve endocarditis or the detection of myocardial abscess, valve perforation, or intra cardiac fistulae. Right-sided Valvular vegetations are often larger than left-sided ones.
- Other investigations done are complete blood count, serum creatinine levels, liver function tests, chest radiography, erythrocyte sedimentation rate, C-reactive protein level, and circulating immune complex titre are commonly increased in endocarditis
- Cardiac catheterization is useful primarily to assess coronary artery patency in older individuals who are to undergo surgery for endocarditis.

Organism (Streptococci)	Drug (dose, duration)
Penicillin – susceptible streptococci, S. Gallolyticus	<ul style="list-style-type: none"> • Penicillin G (2-3mU iv q4h for 4weeks). • Ceftriaxone (2g/day iv as a single dose for 4weeks). • Vancomycin (15 mg/kg iv q12h for 4weeks). • Penicillin G (2-3mU iv q4h) or Ceftriaxone (2g/day iv). for 2weeks plus Gentamicin (3mg/kg qd iv or im as a single dose or divided into equal doses q8h for 2weeks.
Relatively penicillin-resistant streptococci	<ul style="list-style-type: none"> • Penicillin G (4mU iv q4h) or Ceftriaxone (2g iv qd) for 4 weeks plus Gentamicin (3mg/kg qd iv or im as a single dose or divided into equal doses q8h) for 2weeks. • Vancomycin (15 mg/kg iv q12h for 4weeks).
Streptococci- Moderately penicillin resistant, nutritionally variant organisms, or Gemella morbillorum	<ul style="list-style-type: none"> • Penicillin G (4-5mU iv q4h) Ceftriaxone (2g iv qd) for 6weeks plus. • Gentamicin (3mg/kg qd iv or im as a single dose or divided into equal doses q8h) for 6weeks. • Vancomycin as above for 4weeks.

Table 6: Treatment

Staphylococci	
Methicillin-susceptible, infecting native valves	<ul style="list-style-type: none"> • Nafcillin or oxacillin (2g iv q4h for 4-6weeks). • Cefazolin (2g iv q8h for 4-6weeks). • Vancomycin (15mg/kg iv q8-12h for 4-6weeks).
Methicillin-resistant, infecting native valves	<ul style="list-style-type: none"> • Vancomycin (15mg/kg iv q8-12h for 4-6weeks).

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Methicillin susceptible, infecting prosthetic valves	<ul style="list-style-type: none"> • Nafcillin or oxacillin (2g iv q4h for 4-6weeks). • Gentamicin (1mg/kg im or iv q8h for 2weeks) plus Rifampin (300mg PO q8h for 6-8weeks). • Vancomycin (15mg/kg iv q12h for 6-8weeks) plus. • Gentamicin (1mg/kg iv or im q8h for 2weeks) plus Rifampin (300mg PO q8h for 6-8weeks).
Methicillin resistant, infecting prosthetic valves	
TABLE 7	

Enterococci	
	<ul style="list-style-type: none"> • Penicillin G (4-5 mU iv q4h) plus • Gentamicin (1mg/kg iv q8h), both for 4-6weeks • Ampicillin (2g iv q4h) plus Gentamicin (1mg/kg iv q8h), both for 4-6weeks. • Vancomycin (15mg/kg iv q12h) plus • Gentamicin (1mg/kg iv q8h) both for 4-6weeks
Table 8	

Endocarditis, where the causative organism is Enterobacteriaceae is treated with a potent beta-lactam antibiotics plus an aminoglycoside and Corynebacterial endocarditis is treated with penicillin plus an aminoglycoside.

Therapy for Candida endocarditis consists of amphotericin B plus flucytosine and early surgery; long-term suppression with an oral azole is advised. Caspofungin treatment of Candida endocarditis has been effective in sporadic cases.

COMPLICATIONS: Cusp or leaflet rupture/flail perforation, abscess, aneurysm, fistula, dehiscence of prosthetic valve, pericardial effusion (more frequent with abscess). Hemodynamic compromise is valvular regurgitation, acute mitral regurgitation, acute aortic regurgitation, premature mitral valve closure, restrictive mitral inflow pattern, valvular stenosis and congestive heart failure, embolization into systemic, cerebral, pulmonary circulation. Tricuspid valve endocarditis causes pulmonary embolism in 69% of cases.

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