



## A CASE OF BLOOD CULTURE NEGATIVE INFECTIVE ENDOCARDITIS WITH SPLENIC INFARCTS, LIKELY LEFT SIDED PYLONEPHRITIS AND RETINAL ISCHAEMIA

### Medicine

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### KEYWORDS

Blood culture-negative endocarditis, Splenic infarcts, Acute pyelonephritis, retinal ischaemia

#### INTRODUCTION:

Infective endocarditis is an infection affecting the heart valves and inner lining of the heart. It causes high mortality rates. Thus, promptly diagnosing and treating such a patient is vital to their survival. A set of criteria are used to ensure that clinically we can diagnose infective endocarditis. They are known as the modified Duke's criteria.<sup>[1]</sup>

For diagnosing the following must match :

- 2 major and 1 minor criterion or
- 1 major and 3 minor criteria or
- 5 minor criteria

Best results are seen on transesophageal echocardiography

#### Major criteria

- positive blood cultures for infective endocarditis
- typical microorganism for infective endocarditis from 2 separate blood cultures
- *Viridans streptococci*, *Streptococcus bovis*, and HACEK group or community-acquired *Staphylococcus aureus* or *enterococci* in the absence of a primary focus
- persistently positive blood cultures, defined as recovery of a microorganism consistent with infective endocarditis from:
- 2 blood cultures drawn 12 hours apart or all of 3 or most of 4 or more separate blood cultures, with first and last drawn at least one hour apart
- evidence of endocardial involvement
- positive echocardiogram for infective endocarditis
- oscillating intracardiac mass on valve or supporting structures or in the path of regurgitant jets or on implanted material in the absence of an alternative anatomical explanation or
- abscess or
- new partial dehiscence of prosthetic valve or
- new valvular regurgitation

#### Minor criteria

- predisposing heart condition or intravenous drug use
- fever: 38°C
- vascular phenomena: major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, and Janeway lesions
- immunologic phenomena:
- glomerulonephritis
- Osler nodes
- Roth spots
- rheumatoid factor
- 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
- echocardiography findings consistent with infective endocarditis but not meeting major criteria as noted previously

The duration of endocarditis is important since it can give hints to the possible organisms causing it. The two types include : Acute type which happens over hours and subacute type which happens over weeks or days. In the acute form, commonly responsible organism is *staphylococcus*<sup>[2]</sup> and destruction of the heart valves occur rapidly. Subacute form, on the other hand, is caused by *Streptococcus viridians*<sup>[3]</sup>. Clinical features include constitutional symptoms (fatigue, fever/chills, malaise), signs of pathological cardiac changes (e.g., new or changed heart murmur, heart failure signs), and, in some cases, manifestations of subsequent damage to other organs (e.g., glomerulonephritis, embolic stroke). Also, it is important to classify the endocarditis based on whether it originated in the native valve or prosthetic valve. This helps in treating with more precision.

#### Pathophysiology:

Once the endothelial layer of the valve gets destroyed, the subendothelium is exposed, platelets and fibrin start attaching themselves to it, leading to formation of microthrombi. [Sterile vegetations]. An infection can now cause bacteremia - the bacteria targets the sterile vegetation and forms fibrin clots which contain the vegetation inside it. The valve ultimately is destroyed and becomes a regurgitant valve. In case of IV drug abusers as seen in this case, tricuspid valve becomes the most frequently affected valve.<sup>[5]</sup> Otherwise, frequency wise, most commonly involved valves are: mitral valve followed by aortic valve followed by tricuspid valve followed by pulmonary valves. Thus, the thrombus now formed goes on to lead to ischaemia and infarction and embolization. The emboli can metastasize. Also, formation of immune complexes which later travel to other organs produce Osler's nodes etc.

IE prophylaxis is administered in specific circumstances, e.g., in patients with congenital heart disease having certain dental procedures. IE is typically fatal if left untreated.

#### Clinical Features:

Fever is usually the most common symptom to present, chills and also weight loss. Murmurs may also be present.

#### History:

Patient, aged 41 years, male is a known alcoholic and smoker and presented with fever since a few days with history of headache and generalized body pain and pain in the left upper part of abdomen. Before coming to our hospital, he was admitted in 2 local hospital where he received intravenous antibiotics and later discharged. Patient was moderately built and nourished and had clubbing of the nails. There were also splinter hemorrhages on his nails [FIG 1].

#### On Examination:

His vitals were normal except for tachycardia and not maintaining saturation at room air with a SpO<sub>2</sub> - 85%, which improved on 2 liters of oxygen. On systemic examination, a pan systolic murmur was heard in the mitral area. Also, he had severe tenderness in left hypochondrial region in his abdomen.

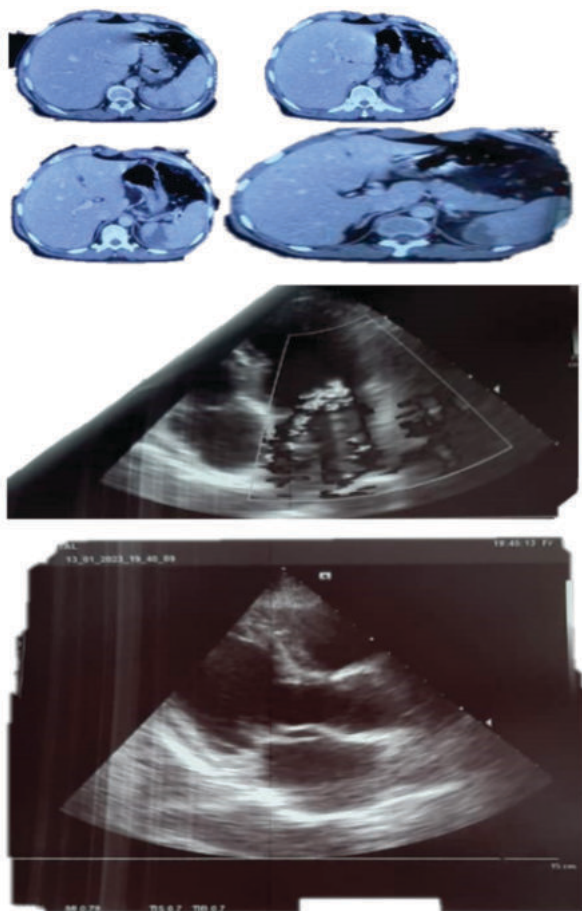


#### Investigations:

His investigations prior to admission showed CRP was 96, total leukocyte count was 13,300 and mild anemia 3 months back. In our hospital, the WBC count was 18,830, his Hb was initially 10.65 which eventually became 9.3 after 6 days. The liver function test revealed

AST- 97, ALT – 255, and Alk Phosphatase -401, Urea- 12 and creatinine- 0.8. His ecg was normal. The 2D echocardiogram however revealed severe eccentric mitral regurgitation, mitral regurgitation jet directed antero medially, with dangling structure noted on posterior mitral valve leaflet , with EF -60% and grade 2 left ventricular diastolic dysfunction with 25+ RAP. The findings suggested Infective endocarditis. [FIG 2].

His ultrasound abdomen showed hepatomegaly with? Hemangiomas and acute pylonephritis in left kidney Hence CECT abdomen was done which showed significant stenosis of the distal splenic artery and its posterior branch with multiple small and large areas of splenic infarcts.[FIG 3]. Possible hemangiomas of liver. His blood culture did not reveal any growth having received intravenous antibiotics previously from the 2 local hospitals. Nor did his urine routine reveal anything. Fundoscopy revealed retinal ischemic areas in left eye and with hard exudates at macula and cotton wool spots at supero temporal arcade . His chest X ray was normal



#### Treatment Given:

Treatment given consisted of thiamine, IV fluids, Inj Ceftriaxone, Inj Vancomycin and Inj Gentamycin with alternate day monitoring of creatinine and anti pyretics.

His creatinine increased during the hospital stay and hence gentamycin was stopped.

However , due to lack of patient compliance on OPD basis , the patient again presented with fever for a second admission. For this , a repeat course of antibiotics was given as used previously. He was later referred to a higher centre for assessment by a cardiac surgeon.

#### DISCUSSION:

In this case , embolization occurred and spread to the spleen<sup>[6]</sup> leading to splenic infarcts , which were picked up on CECT abdomen. Also , retinal ischaemia was found on fundoscopy and pylonephritis of the left kidney. The causative agent is unclear since the blood culture was negative for growth of any organisms.

Modified Duke's criteria met include <sup>[1]</sup>

Among the major criteria , 1 was met : Echocardiogram positive for Infective endocarditis

The following 4 minor criteria were met :-Intravenous drug abuse history ,Fever, Vascular phenomena such as septic emboli leading to splenic infarction, retinal ischaemia and likely left sided pyelonephritis. Also, immunologic phenomenon such as splinter hemorrhages .

As for the blood cultures, at least 3 sets of blood cultures should be obtained from different veins and should be taken 30 to 60 mins apart , before starting antibiotic therapy. But, in this patient ,although the same was collected, patient gave history of having received iv antibiotics for his fever from a local hospital previously. And hence , empirical antibiotics were started based on the above criteria. The antibiotics were chosen with staphylococci in mind, possibly methicillin resistant and sensitive. Thus, Vancomycin at a loading dose of 20 mg/kg and body weight was given . Also, a maintenance dose of the same , 15 mg/kg for every 8 hours was started for 6 weeks .

The next likely organism was penicillin sensitive streptococcus viridians , for which Inj gentamycin and ceftriaxone combination were considered . Gentamycin at the rate of 3 mg/kg per day single dose everyday was used. <sup>[7]</sup> Along with this , ceftriaxone 2 gms once a day was used. <sup>[7]</sup> This combination was given for 2 weeks however , renal parameters showed worsening and hence gentamycin was stopped.

In one of the studies , gentamycin has been found to be 90 percent avoidable , in case patients experience nephrotoxicity as a side effect of giving aminoglycoside.<sup>[8]</sup> Hence ,gentamycin was stopped as soon as the renal parameters were found to be deranged .

#### CONCLUSION:

Blood culture negative infective endocarditis has worse prognosis than blood culture positive infective endocarditis<sup>[9]</sup>. If clinical features of infective endocarditis are present, as in this case, it still should be treated in order for the patient to survive. As in this case, often times , blood culture is negative as a result of using antibiotics to treat the fever, and hence have led to no growth.

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