

# Native Valve Endocarditis Caused by *Escherichia Coli*

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## ABSTRACT

*Escherichia coli* is a rare cause of infective endocarditis. This report describes a case of native valve endocarditis caused by *Escherichia coli* in a 58-year-old male renal transplant patient who had a concurrent urinary tract infection caused by the same organism. The patient was successfully treated with antibiotics and recovered without surgical intervention.

**Keywords:** Amikacin, Coccobacilli, Echocardiogram, Haematuria, Netlimicin, Urinary tract infection

## CASE REPORT

A 58-year-old male attended a tertiary care hospital with a history of fever associated with chills and rigor of six weeks duration. He also complained of dyspnoea, cough, chest pain and palpitation. He had undergone a renal transplant four years ago for treatment of congenital polycystic kidney disease. He had mild renal insufficiency and compensated metabolic acidosis.

On physical examination, he was febrile (105°F), blood pressure was 110/80 mmHg, and pulse rate 81 per min. The total leucocyte count was  $4.8 \times 10^3$  cells/mm<sup>3</sup> with 81% neutrophils, 11% lymphocytes, 1% eosinophils and 7% monocytes. The haemoglobin level was 10.0 gm/dL, erythrocyte sedimentation rate 134 mm for 1 hour, C-reactive protein 268 mg/dL, urea 53 mg/dL, creatinine 2.29 mg/dL and random blood sugar was 163 mg/dL. The peripheral blood smear showed normocytic normochromic anaemia and neutrophilia with toxic granules. Routine examination of the urine showed marked proteinuria, microscopic haematuria and many pus cells and motile bacilli. The transthoracic echocardiogram demonstrated vegetation on the aortic valve and mild annular calcification without any evidence of pericardial effusion. The electrocardiogram showed normal sinus rhythm.

Blood cultures were done by collecting three consecutive blood samples at intervals of one hour. Approximately, 10 ml of venous blood was inoculated into 100 ml brain heart infusion broth supplemented with 0.01% sodium polyanethol sulphonate (HiMedia Laboratories, Mumbai). The blood culture bottles were incubated at 37°C for 18-24 hours and observed daily for signs of growth. Turbidity was noticed in all the three bottles within 18-24 hours and Gram-stained smears showed Gram-negative, pleomorphic, coccobacilli. The broth was subcultured on to 5% sheep blood agar and MacConkey agar and incubated at 37°C. After 18 hours of incubation, MacConkey agar medium showed lactose-fermenting colonies, about 2-3 mm in diameter. Colonies on blood agar were grey and non-haemolytic. They were found to be Gram-negative, motile, pleomorphic, coccobacilli, which were oxidase negative and catalase positive and identified by standard biochemical tests [1] as *Escherichia coli*. Culture of the urine also grew *Escherichia coli* with a colony count of  $>10^5$  CFU/ml.

Antimicrobial susceptibility testing was performed by the Kirby Bauer disc diffusion method as per CLSI recommendations [2]. The isolate was found to be sensitive to imipenem, moderately sensitive

to amikacin, cefotaxime, ceftriaxone and resistant to netlimicin, ceftazidime, cefuroxime, ciprofloxacin, and levofloxacin.

The patient was treated with intravenous infusion of ceftriaxone 2 g twice daily for two weeks and amikacin 80 mg once daily for eight weeks. He responded well to treatment and was afebrile within 72 hours after initiation of therapy. Antibiotic treatment was continued for eight weeks. Repeat blood cultures were sterile.

## DISCUSSION

*Escherichia coli* has emerged in recent years as an increasingly important cause of morbidity and mortality in both immunocompetent and immunosuppressed persons. Nevertheless it remains an extremely uncommon cause of infective endocarditis [3]. The increase in the numbers of immunocompromised patients has led to a change in the spectrum of organisms causing native valve endocarditis. *Escherichia coli* is a common cause of urinary tract infections. The low incidence of endocarditis caused by this organism has been attributed to its inability to adhere to endocardium, and also to the fact that normal serum often has antibodies to *Escherichia coli* [4]. Gram-negative bacteria are less sensitive to complement-mediated lysis and other humoral innate immune defences; they lack surface proteins that specifically bind host matrix molecules and prosthetic material which make them rare causative agents of infective endocarditis. However, they possess virulence factors such as adhesins, iron acquisition systems, and toxins which make them serious pathogens once they gain entry into a normally sterile extra intestinal site [5]. Endocarditis caused by Gram-negative organisms is associated with high mortality and significant morbidity and necessitates aggressive medical management and early surgical intervention. This patient had no history of cardiac disease and the source of the infection was likely to be the urinary tract. He responded well to antibiotic therapy and did not require surgical intervention.

## CONCLUSION

Urinary tract infection appeared to be an important predisposing factor in the development of *E. coli* endocarditis in this patient who had no specific cardiac risk factors. Persistent fever in an immunocompromised patient with urinary tract infection despite specific antibiotic treatment should be investigated to rule out serious infections such as endocarditis.

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