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Escherichia Coli Native Valve Infective Endocarditis in a Child Managed in a Low Setting Area: A Case Report

Endocardite infectieuse à Escherichia Coli sur valve native chez un enfant prise en charge dans une zone à faible ressources : à propos d'un cas

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ABSTRACT

We report the case of a native valve infective endocarditis cause by *Escherichia Coli* in a 7 years old child. He presented with a one week history of fever and bilateral knee pains. He had been in a health centre where a malaria treatment and antibiotics were administered. The child was acutely ill and had a mitral valve regurgitation murmur at auscultation. Cardiac echography revealed a vegetation on the anterior mitral leaflet. Blood culture was positive for *Escherichia coli*. The child fully recovered after a 4 weeks course of appropriate antibiotics.

RÉSUMÉ

Nous présentons un cas d'endocardite infectieuse sur valve native causée par Escherichia coli chez un enfant de 7 ans. Il a été amené en consultation pour une fièvre et une gonalgie bilatérale évoluant depuis une semaine. Il avait été dans un centre de santé où un traitement antipaludique et des antibiotiques ont été administrés. L'enfant présentait un état général altéré et un souffle d'insuffisance mitrale à l'auscultation. L'échocardiographie a révélé une végétation sur le feuillet antérieur de la valve mitrale. L'hémoculture était positive à Escherichia coli. L'enfant s'est complètement rétabli après 4 semaines de traitement antibiotique approprié.

INTRODUCTION

Infective endocarditis (IE) is an infection of the endocardium and/or heart valves usually caused by bacteria that involves vegetation formation, which may damage the endocardia or valves [1]. It is uncommon in children and favoured by a pre-existing congenital or rheumatic heart disease but up to one third of cases occur in children without underlying heart disease [2,3]. A high index of suspicion is therefore necessary to make the diagnosis in those cases. Staphylococcus and Streptococcus strains of bacteria are the most common causes of IE, but there some rare cases caused by other germs [2,4]. The clinical presentation may also differ depending on the causative organism and the underlying heart disease [4]. Prompt diagnosis and treatment are mandatory for optimal patient outcomes and often requires imaging and laboratory studies which are not readily available in low setting areas.

CASE PRESENTATION

A 7 years old child who was brought by his parents for a one week history of fever and bilateral knee pains. He had been in a health centre where a malaria treatment and many antibiotics were administered. The physical examination found an ill looking child with a temperature of 39.2°C, several dental caries and a mitral valve regurgitation murmur at auscultation. A cardiac echocardiography showed the presence of a vegetation on the ventricular aspect of the anterior mitral leaflet.
The medical history of the child was remarkable of poor mouth hygiene. There was no notion of congenital heart disease nor pre-existing heart murmur. There also was no past history of recurrent pharyngitis and skin infections.

Investigations

Upon admission, laboratory tests showed raised white blood cells count (17.7 x 10^9/L) and granulocytes (12.5 x 10^9/L), moderate microcytic and hypochromic anaemia (Hb = 8.1 g/dl), thrombocytosis (632 x 10^9/L). The C-reactive protein (CRP) level was elevated at 24 mg/L. In order to rule out a previous streptococcal infection, the antistreptolysin O antibody (ASLO) titer was measured and was positive at 800 IU/ml. In the same way for malaria, a thick smear done was positive (1200 trophozoides/µL).

The echocardiogram performed at the University Teaching Hospital of Yaoundé showed a mobile hyperdense mass on the ventricular side of the anterior mitral leaflet. The electrocardiogram was normal.

Two blood culture were done in order to identify the causative organism. One of them was negative and the second grown Escherichia Coli. The antibiogram showed sensitivity for piperacillin – tazobactam, imipenem, amikacin and fosfomycin. Haemoglobin electrophoresis was also performed to look for sickle cell disease and the result was AS (58.7% of Hb A, 39.0% of Hb S and 2.3% of Hb A2). A control echocardiography done after four weeks of appropriate antibiotic treatment revealed the reduction in size and calcification of the mas on the anterior mitral leaflet.

Figure 1: Echocardiography at admission showing a high frequency mobile mass on the ventricular side of the great mitral valve leaflet which was identified as a vegetation.

Figure 2: Control cardiac echocardiography performed for week after treatment. The vegetation was no more visible.

Differential diagnosis

This child presented with high fever, arthralgia and a new onset heart murmur. The first challenge was to differentiate between an IE and an acute rheumatic fever. IE was the leading hypothesis since it is commonly admitted that fever plus new onset heart murmur is an IE until proven otherwise. It was confirmed when the cardiac echocardiography revealed a vegetation on the mitral valve.

The second challenge was to determine the causative organism of the IE. Given the poor mouth hygiene and the presence of multiple dental caries, we thought Viridans group streptococcus as the cause, but the result of blood culture showed another germ.

Treatment

An empiric antibiotherapy was initiated after blood cultures were collected and combined ceftriaxone 100 mg/kg/day and gentamycin 3 mg/kg/day. It was later adapted according to the antibiogram to amikacin 15 mg/kg/day during two weeks plus imipenem/cilastatin 2g/day during 4 weeks. Concurrent antimalarial treatment was administered, antipyretic drug only for high fever and pain killers. Dental caries were also treated.

Outcome and follow-up

Apyrexia was obtained 4 day after the initiation of the appropriate antibiotics. The heart murmur disappeared after two weeks and the child was discharge after complete recovery at the fourth week. At follow-up two week later, the child was in good health and had resumed school. A counselling was done regarding prophylaxis during dental procedures.

DISCUSSION

Escherichia coli is a rare cause of IE accounting for only 0.51% of cases and is associated to Urinary tract infection in half cases [5]. Most cases of E. coli IE occur in older women with diabetes mellitus. Other conditions that may be predisposing factor are high alcohol consumption, haemodialysis and malignancies [5]. The case we reported here was a child who did not have any of the predisposing factor we cited earlier. However, he had a sickle cell trait which may be symptomatic in some people [6]. We therefore think he was more susceptible to infections caused by E. coli. We have been able to handle this case thanks to the proximity of the town from Yaoundé the capital city of Cameroon, were the cardiac echography and blood cultures done respectively in the University Teaching Hospital of Yaoundé and the Centre Pasteur du Cameroun.

TAKE HOME MESSAGE

- IE is rare but not impossible to occur in children without pre-existing heart disease
- Blood cultures should always be done even though the aetiology seems evident
- Cases of IE can be managed in low setting areas in collaboration with better equipped health facilities.

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