

# Concurrent Acute Rheumatic Fever and Infective Endocarditis: Case Report

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## Abstract

Acute rheumatic fever (ARF) is an inflammatory disease that occurs following an infection with certain strains of group A beta-hemolytic streptococci. Despite dramatic falls in the incidence, Acute Rheumatic Fever remains a major cause of morbidity and mortality associated with acquired heart disease in developing countries. Infective endocarditis (IE) is defined as a microbial infection of the endothelial surface of the heart. IE occurs most frequently in patients with chronic rheumatic heart disease. As far as we know, the simultaneous occurrence of both conditions has not been previously reported. References to our outpatient clinic with complaints of fever and joint pain, clinical and laboratory findings suggestive of infective endocarditis fits both with both the ARF and remitted entirely with appropriate treatment, as far as we know, we think that this is not a case of our similar event in the literature. Here we present a case of a fifteen-year-old girl with concurrent acute rheumatic fever and infective endocarditis.

## Keywords

Rheumatic Fever, Infective Endocarditis, Heart

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## 1. Introduction

Acute rheumatic fever (ARF) is an autoimmune inflammatory disease that occurs following an infection with certain strains of group A beta-hemolytic streptococci. ARF has extremely variable manifestations and remains a clinical syndrome for which no specific diagnostic test exists. Persons who have experienced an episode of ARF

are predisposed to recurrence following subsequent (rheumatogenic) group A streptococcal infections [1]. Despite dramatic falls in the incidence, rheumatic fever is still an endemic disease in developing countries, and it remains a major cause of morbidity and mortality associated with acquired heart disease in developing countries. Rheumatic heart disease is the most serious manifestation of rheumatic fever. Carditis is the only manifestation of acute rheumatic fever (ARF) that leads to permanent disability [2].

Infective endocarditis (IE) is defined as a microbial infection of the endocardial surface of the heart, which may include one or more heart valves, the mural endocardium, or a septal defect. Its intracardiac effects include severe valvular insufficiency, which may lead to intractable congestive heart failure and myocardial abscesses [3] [4]. Infective endocarditis (IE) is defined as a microbial infection of the endothelial surface of the heart. Infective endocarditis, which is also an important cause of mortality and morbidity, is rare in children [5]. Here, we present a case of a fifteen-year-old girl with concurrent ARF and IE.

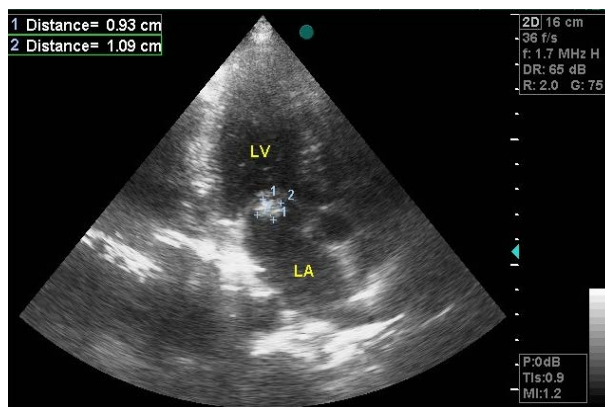
## 2. Case

The fifteen-year-old girl patient was admitted to the hospital with fever up to 39 degrees, joint pain and swelling. Five days ago, her left knee was painful and swollen, but before three days it has improved. The joints involved before two days include the right knee and right ankle. On physical examination, the patient's heart rate: 118 beats per minute, respiratory rate: 22 breaths per minute, blood pressure 110/70 mmHg. Heart sounds are tachycardic with a pansystolic murmur 3/6 heard at apex with radiation to axilla. Detailed oral examination revealed two decayed teeth with a poor oral hygiene. Laboratory investigations revealed neutrophilic leukocytosis (WBC  $18.100/\text{mm}^3$ , N 80%), elevation of ESR and CRP (106 mm/hr and 132 mg/dl, respectively), elevated streptococcal antibodies (ASO titre 947 U/mL) and serum complement 3 ( $C_3$ ) level was normal. The result of other laboratory tests include rheumatoid factor, anti-nuclear antibody (Ab), anti-double-stranded-DNA Ab, and rose bengal tests were all negative. Transthoracic echocardiography (TTE) revealed severe mitral regurgitation and mild aortic regurgitation. Mitral leaflets were slightly thickened and  $10.9 \times 9.3$  mm vegetation was found on anterior leaflet (Figure 1). Viridans group streptococci were isolated from two blood culture samples. The patient was diagnosed with ARF according to the modified Jones criteria, and diagnose of IE was based on modified Duke criteria [6] [7]. Acetyl-salicylic acid therapy at 100 mg/kg/day was started and continued for eight weeks, and her arthritis was improved dramatically. Intramuscular benzathine penicillin treatment was started, which was given every three weeks for streptococcal prophylaxis. Her symptoms and laboratory data was improved in thirteen days after treatment. The patient also was treated with vancomycin (40 mg/kg/day q 6 h for 40 days) for IE, and a second echocardiograph confirmed decrease in size of vegetation. However, vegetation was disappeared two months after treatment (Figure 2). The patient is still followed by our pediatric cardiology clinic.

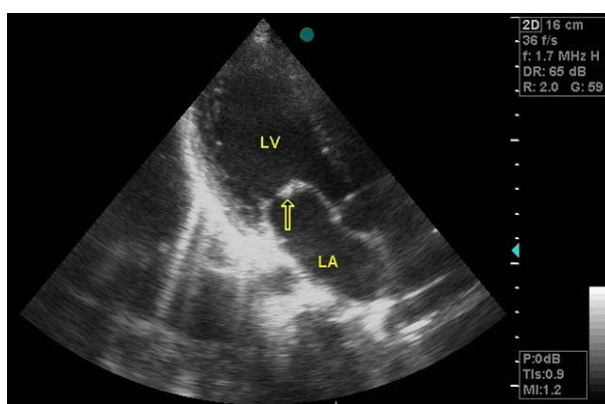
## 3. Discussion

Acute rheumatic fever and rheumatic heart disease continue to be an important cause of cardiovascular morbidity and mortality in the developing world and account for over 30% of all pediatric cardiac admissions [2]. Acute rheumatic fever, a sequel of group A streptococcal throat infection, occurs in untreated susceptible children and is a multisystem inflammatory disease. The clinical signs of ARF are the same throughout the world. Arthritis is the earliest and the most common feature of the disease, present in 60% - 80% of patients. Carditis, the most serious manifestation of the disease, occurs a few weeks after *Streptococcus pyogenes* throat infection in 30% - 45% of ARF patients, and usually presents as pancarditis. Rheumatic endocarditis is the most serious sequel and frequently leads to chronic rheumatic heart disease. Valvular lesions and mitral and aortic regurgitation are the most common events caused by repeated valvulitis [8] [9]. Acute rheumatic fever (ARF) is diagnosed on the basis of clinical manifestations supported by laboratory tests. The diagnosis of rheumatic fever is based on the Jones criteria [6] (Table 1). Treatment strategies for acute rheumatic fever (ARF) can be divided into management of the acute attack, management of the current infection, and prevention of further infection and attacks. The primary goal of treating an ARF attack is to eradicate streptococcal organisms and bacterial antigens from the pharyngeal region [10].

Infective endocarditis is a microbial infection of the endothelial surface of the heart [11]. According to the Duke criteria, diagnosis of infective endocarditis can be definite, possible, or rejected. A definitive clinical diagnosis is made based on the presence of 2 major criteria, 1 major criteria and 3 minor criteria, or by 5 minor



**Figure 1.** Vegetation on the mitral valve.



**Figure 2.** After the treatment of mitral valve.

**Table 1.** Guidelines for the diagnosis of initial attack of rheumatic fever (Jones Criteria).

Major manifestation	Minor manifestation
Carditis	Fever
Migratory polyarthritits	Arthralgia
Sydenham's chorea	Elevated acute phase reactants (ESR, CRP)
Subcutaneous nodules	Prolonged PR interval on ECG
Erythema marginatum	

Diagnosis is established if two major or one major + two minor plus

- Supporting evidence of a recent group A streptococcal infection (positive throat culture or rapid antigen test, elevated or increasing streptococcal antibody test)

criteria. Our patient meets 2 major criteria, such as 2 separate positive blood cultures with viridans-group streptococci and evidence of endocardial involvement with positive echocardiogram. The major goals of therapy for infective endocarditis (IE) are to eradicate the infectious agent from the thrombus and to address the complications of valvular infection. The latter includes both the intracardiac and extracardiac consequences of IE.

Childhood IE was previously only a rare complication of rheumatic heart disease. However, the growing number of patients living with surgical repairs of congenital lesions now represents the majority of patients developing IE in childhood [12]. Despite the improvements in the diagnosis, surgery and medical treatment, IE is

still a major problem for clinicians and protects its seriousness for mortality rates between 15% - 20% [13]-[15]. Therefore, early diagnosis and treatment is critical in saving lives. In our case, appropriate treatment was started immediately after the diagnosis and the patient was recovered completely after the treatment. The patient is being followed up by our pediatric cardiology department with ARF secondary prophylaxis.

In developing countries, IE occurs most frequently in patients with chronic rheumatic heart disease. There is a certain time that elapses between two clinical conditions [16]. To our knowledge the simultaneous occurrence of both conditions has not been previously reported.

#### 4. Conclusion

In this case, we reported simultaneous occurrence of IE and ARF. Patients, who had an episode of ARF with high fever and was revealed marked thickening leaflets in echocardiography, should be evaluated carefully for IE. Such patients should be monitored closely with serial echocardiography and blood cultures should be obtained.

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