

Clinical Cardiology Research and Reports

**Short Communication** 

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## **Electrophysiological and Histological Study of Rheumatic Heart Disease**

Mayosi N\*, Rothenbühler H, Johnson J, Carapetis B

Department of General Sciences, Burkina

\*Corresponding Author: Mayosi N, Director General of Burkina Faso's Institute of Sciences, Burkina.

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### Abstract

Rheumatic fever (RF) remains endemic in many countries and frequently causes heart failure due to severe chronic rheumatic valvular heart disease, which requires surgical treatment. Here, we report on a patient who underwent an elective surgical correction for mitral and aortic valvular heart disease and had a post-operative diagnosis of acute rheumatic carditis. The incidental finding of Aschoff bodies in myocardial biopsies is frequently reported in the nineteenth-century literature, with prevalences as high as 35%, but no clinical or prognostic data on the patients is included.

Keywords: Rheumatic myocarditis; rheumatic fever; abdominal distension

### Introduction

Rheumatic heart disease has a variety of clinical manifestations including myocarditis, decompensated congestive heart failure, arrhythmias (i.e., atrial fibrillation), and valvular heart disease. Myocarditis can result in conduction disturbances in the heart. Therefore, an electrocardiogram (EKG) is necessary. An EKG can show varying forms of heart block including first-degree, second-degree, or third-degree AV block.A chest x-ray should be completed to evaluate for cardiomegaly or pulmonary vascular congestion, which can be signs of congestive heart failure. A transthoracic echocardiogram is more sensitive and specific than auscultation during the physical examination for detection of rheumatic heart disease. Rheumatic heart disease seen on transthoracic echo without evidence of a murmur on auscultation is referred to as "subclinical rheumatic heart disease.Mitral regurgitation is the most common presentation of rheumatic heart disease in young people. However, rheumatic heart disease is the most common cause of mitral stenosis worldwide. Common descriptions of the mitral valve on echocardiography are 'dog-leg' 'elbow' or 'hockey-stick' deformities, which all help describe the thickening and restricted motion of the anterior mitral valve leaflet.

### The Rise, Fall, and Resurgence of RF

There has been a profound decline in RF in Europe and North America beginning around the middle of the last century. Until recently, the incidence of RF was so low that it was thought to have all but disappeared in the United States. The inappropriateness of a complacent approach was highlighted by a sharp rise in the incidence of RF in geographically distinct regions of the United States, starting in Utah in 1985. A surge in the incidence of RF has been noted elsewhere as well. With the collapse of the USSR, the incidence of RF has increased dramatically in the former central Soviet republics, approaching 233/100 000 in children in Kyrgyzstan. Increasing trends of RF incidence have also been noted in Italy and the Eastern Mediterranean.

# Echocardiography to Define Structural and Functional Abnormality in Acute RF and Chronic RHD.

Previous descriptions of cardiac involvement in RF and RHD relied on postmortem studies and observations made during surgery. Although these

methods were useful, both were limited by the fact that the heart was examined in a flaccid nonbeating state.

### **Acute Rheumatic Fever**

A long-held belief that heart failure and death during an episode of RF were the result of myocarditis was perpetuated by clinical observation of tachycardia and a gallop rhythm, little macroscopic abnormality of the mitral valve at postmortem, and evidence of inflammation on histology. Echocardiography in these patients, however, confirmed an almost uniform presence of severe mitral or aortic regurgitation, normal left ventricular contractile function, and amelioration of heart failure with successful valve surgery.

The histological finding of Aschoff bodies is the most characteristic finding of rheumatic inflammation in the heart and effectively makes the diagnosis of acute rheumatic myocarditis. Rheumatic myocarditis is a particular feature of acute rheumatic carditis, which also encompasses rheumatic pericarditis and rheumatic valvulitis. The incidental finding of Aschoff nodules diagnoses acute rheumatic myocarditis, as was observed in our patient. In acute RHD, histological analyses have shown the presence of dense valvular inflammatory infiltrates and Aschoff nodules in the myocardium of 21% of patients. Infiltrating T-cells were mainly CD4+ cells in heart tissue biopsies of patients with rheumatic activity. In addition, CD4+ and CD8+ infiltrating T-cell clones recognized streptococcal M peptides and cardiac tissue proteins. These findings may open new possibilities of immunotherapy. In addition, it was demonstrated that the surgical procedure during the acute phase of the disease improved the quality of life of young RHD patients. The diagnosis of acute rheumatic myocarditis is difficult and frequently requires the use of multiple imaging techniques. An echocardiography can reveal mild to moderate pericardial effusion (rarely pericardial effusion or even pericardial tamponade). Transesophageal echocardiography can sometimes show small multiple vegetations on the edge of native valves, representing the rheumatic verrucae that characterize the acute phase of the disease. Laboratorial exams show high-inflammatory markers, such as the erythrocyte sedimentation rate and the C-reactive protein. The highly sensitive C-reactive protein may increase in chronic rheumatic heart disease, indicating that an inflammatory response still persists in the chronic phase.



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## Conclusion

The clinical value of vasodilator stress cardiac MRI for the quantitative assessment of microvascular disease has been proven. However, data about the use of this modality in patients with acute cardiac inflammation are sparse.

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