Acute rheumatic fever in adults

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Summary

Thirty-one adults with acute rheumatic fever were identified at Groote Schuur Hospital over a 10-year period. In keeping with other series, arthritis was the most common major criterion. However, unlike other series, cardiac involvement was a prominent feature. Two patients died and a further 4 required valve replacements as a result of the disease. This suggests that local factors are of importance in determining the morbidity of the disease and that physicians should consider acute rheumatic disease in adults who present with unexplained valvular disease or carditis.

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Acute rheumatic fever (ARF) is commonly thought of as a disease of children. It is, however, a well-documented but uncommon disease in adults.[1-4] Reports in the literature indicate that the major manifestation in adults are arthritis and carditis; the other major criteria associated with the disease in children are rarely encountered in adults. Most of these reports deal with rheumatic fever in developed countries.[3-6] There is evidence to suggest that the disease may be influenced by the local situation. South Africa has a combination of developed and developing populations and has a high incidence of rheumatic fever. The purpose of this paper is to review the cases of adult rheumatic fever diagnosed at Groote Schuur Hospital over a 10-year period, to document the symptoms, morbidity and mortality, and to compare these results with the published data.

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Patients and methods

Cases of acute rheumatic fever diagnosed in patients aged ⩾ 19 years between 1974 and 1984 were identified using the computer records at the hospital. All details were examined to ensure that they fulfilled the modified Jones criteria.[7,8] Reasons for using the 1955 criteria and not the revised criteria[9] of 1965 will be discussed later. However, the majority of cases fulfilled both sets of criteria.

Carditis was diagnosed if there was documented evidence of one or more of the following:[10] (*i*) development of a new abnormal murmur; (*ii*) congestive cardiac failure or cardiomegaly in the absence of any other cause; and (*iii*) pericarditis — manifested by a friction rub and ECG changes.

Arthritis was diagnosed if there was objective evidence of arthritis occurring either as: (*i*) an abrupt onset of additive arthritis,[4] and (*ii*) a migratory polyarthritis where acute arthritis in one joint is settling when a second joint becomes acutely inflamed ('flitting arthritis').

Skin involvement. Only 1 patient with erythema marginatum was noted.

Chorea. There were no cases.

Streptococcal infections. Throat swabs and antistreptolysin O titres (ASOT) were the two methods used as evidence of recent streptococcal infection. Throat swabs were positive in only isolated cases. An ASOT of > 200 Todd units in an adult is regarded as evidence of recent streptococcal infection in this institution.

Minor criteria. These included a history of rheumatic fever, fever, elevated erythrocyte sedimentation rate (ESR), leucocytosis and prolonged P-R interval on ECG.

Results

Thirty-one patients were identified as having had acute rheumatic fever, and of these the attack of rheumatic fever was the first in 8 patients. There were 23 women. The age range was 19 - 55 years. Twenty-seven patients were of the so-called 'coloured' group (i.e. of mixed racial origins) and 20 of these were women. There were no white female or black male patients (Fig. 1).

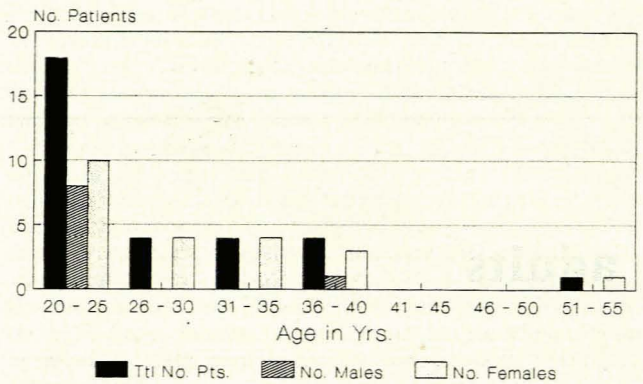

Fig. 1. Age and sex of patients with ARF.

Twenty patients had a history of ARF and 16 of these had developed valvular disease. Three patients had valve lesions suggestive of previous rheumatic fever but no documented history thereof. These patients were classed as having previously had rheumatic fever.

There were no clinical features to suggest any differences between patients with an index attack and those suffering a recurrence.

Criteria

Seven patients presented with two major criteria, the rest with one major and at least two minor criteria (Table I). In all cases the ESR was raised.

Antecedent streptococcal infection

Twenty-seven patients had elevated ASOT; and in 1 patient the diagnosis was made at autopsy, while 2 had classic clinical features, and in the fourth the diagnosis was made by exclusion and response to treatment. Two of these last-mentioned 4 patients had a history of previous ARF.

Arthritis

Arthritis was the most common presenting symptom, being present in 24 of 31 patients. In 17 patients it was the only major criterion. A 'flitting arthritis' was present in 13 patients.

TABLE I. JONES CRITERIA IN PATIENTS PRESENTING WITH ACUTE RHEUMATIC FEVER

Carditis + arthritis	6
Carditis + 2 minor criteria	7
Arthritis + 2 minor criteria	17
Arthritis + erythema marginatum	1

Constant or an additive arthritis was present in a further 6 patients. In the remainder the clerking notes were insufficiently detailed to enable the arthritis to be classified.

Carditis

Five of the 8 patients experiencing their first attack of ARF developed valve lesions — 3 mitral incompetence, 1 mitral stenosis, and 1 both mitral and aortic incompetence. Seven patients with a history of previous ARF developed new valve lesions or a significant deterioration in existing lesions (Table II). Four patients required valve replacements within a year of the attack. No definite cases of myocarditis were noted. All patients who presented in heart failure had underlying valve disease. There were no cases of pericarditis. Seven patients developed a prolonged PR interval on ECG and 5 were found to have atrial fibrillation not previously documented.

TABLE II. NEW VALVE LESIONS IN 7 PATIENTS WITH HISTORY OF ACUTE RHEUMATIC FEVER

Age (yrs)/sex	Pre-existing valve lesion	New lesion
22 M	AI	Required AVR
24 F	Nil	MI/AI
30 F	MI/MS	AI
20 M	MI/MS/AI	Required AVR/MVR
27 F	Nil	MI
19 M	MI/AI	Required AVR
21 F	MI/AI	Required AVR

AI = aortic incompetence; AVR = aortic valve replacement; MI = mitral incompetence; MVR = mitral valve replacement; MS = mitral stenosis.

Fatal outcome

Two patients died. Both were young coloured women.

Case 1. A 20-year-old patient with no previous history of rheumatic fever presented to hospital with signs and symptoms of carditis and consolidation at both lung bases. She was critically ill and was admitted to the Cardiac Intensive Care Unit, where she died within 24 hours. Autopsy revealed the presence of recent Aschoff nodes in the myocardium and on the mitral valve. Histological evamination of the lung lesions showed them to be suggestive of pneumonitis, possibly of rheumatic origin.

Case 2. A 21-year-old patient, with a history of recurrent attacks of ARF and established mitral stenosis, mitral incompetence and aortic incompetence, presented to hospital in left ventricular failure and subsequently died. Infective endocarditis was excluded on clinical grounds, and because blood cultures showed nothing abnormal. No vegetations were found at autopsy but Aschoff nodes of recent origin were detected.

Prophylaxis and intervals between attacks

The 20 patients with previously documented ARF had received regular antibiotic prophylaxis. Thirteen had either been advised to stop the prophylaxis or had done so of their own accord. There were reservations about compliance in 3 cases, while in a further 3 cases the original attack was not recognised and no prophylaxis was ever given. Thus in 19 of 20 cases there was no current prophylaxis. The interval between the previous attack and the index attack varied from a few months to approximately 20 years.

Aetiology

The source of the infection was ascribed to pharyngitis in 12 patients, and to a "flu-like' illness in 1. Therefore in the majority of the cases the precipitating infection was asymptomatic — a well-described phenomenon.[11]

Treatment

All patients were assigned to bed rest. Twelve patients were confined to bed for 2 - 3 weeks. Three required more time before symptoms settled while in 9 patients symptoms settled in 1 - 2 weeks. Only 4 patients were mobilised in less than 1 week. In cases where prolonged bed rest was required the patients had shown the so-called 'rebound phenomenon'[12] — a term used to describe a recurrence of acute arthritis after a patient has been mobilised following a period of bed rest and anti-inflammatory agents.

In 21 patients salicylates were the first-line treatment after bed rest. Most symptoms settled satisfactorily although 4 patients required steroid drugs when symptoms failed to settle. Steroids were used from the outset in 2 patients with severe carditis. In 1 patient pneumonitis was suspected; this settled promptly with the administration of steroid drugs. In cases of severe arthritis, where high doses of salicylates produced unacceptable side-effects, non-steroidal anti-inflammatory drugs (NSAIDs) were used with good results.

Discussion

The results of this study confirm a number of previously reported findings on ARF in adults, including the high incidence of arthritis, its severity and variable nature, as well as the absence of chorea and subcutaneous nodules. However, the high incidence and severity of the valvular lesions must be emphasised, as well as the predominance of female patients, since most series report carditis to be generally benign and the sex ratio equal or nearly equal.[3-5]

Retrospective studies are subject to a number of inadequacies, particularly in regard to a lack of standardised procedures in investigating and managing patients. The study is thus dependent on notes made by physicians other than the author and these may be incomplete. These drawbacks are compounded in a condition such as ARF, in which 'there is no single laboratory test, symptom or sign which is pathognomic of disease although several combinations of them are diagnostic'.[9] This problem resulted in the formulation of the Duckett-Jones criteria,[8] which have been modified[7] and more recently revised.[9] The revised criteria, which make the diagnosis dependent on demonstrating a preceding streptococcal infection, have been reviewed and accepted by the World Health Organisation.[13] Although these criteria have been used in several surveys,[3,4,6,10] they have not been universally accepted and there is no clarity as to their use in diagnosing ARF in adults.[3,10,14-18] Ward[19] has lucidly discussed not only difficulties in demonstrating the causal association between streptococcal infection and rheumatic fever but also the problems of excluding a viral cause for the condition.

The diagnosis of ARF in adults is bedevilled by several factors:

1. The Duckett-Jones criteria are of limited value, since arthritis and carditis are the only two commonly encountered major criteria found in adults. Erythema marginatum is rare and chorea and subcutaneous nodules have not been described.[3-5]

2. The arthritis need not be the classic 'flitting polyarthritis' but may be 'additive'.[4] In the patient with arthritis as the only major feature, the differential diagnosis is wide and includes the reactive arthritides and collagen vascular disorders. The diagnosis would then depend on careful history-taking, evidence of streptococcal infection, and exclusion of other diseases.[4,20,21]

3. The number of conditions that may give rise to carditis and arthritis is considerable and ranges from collagen vascular disorders, such as systemic lupus erythematosus and ankylosing spondylitis, to a combination of ischaemic heart disease and osteo-arthritis. Infective endocarditis must be excluded and the diagnosis may be made by a combination of non-contributory blood cultures, a rising ASOT and a response to therapy.[3,20]

The diagnosis of a recurrence requires a high level of suspicion, since the attacks need not be mimetic,[11] and the carditis may be subclinical.[3,10,22] The patients may present with nonspecific symptoms and low-grade heart failure. In this situation, a history of pharyngitis, an elevated ESR and a rising ASOT would be strong evidence for the diagnosis of ARF. Echocardiography would be a valuable adjunct in detecting subclinical valve lesions.[23] It is probable that recurrent attacks of ARF in adults are underdiagnosed and a diligent search is required in any patient with carditis.[3,20] Autopsy studies have revealed a number of cases of unsuspected rheumatic heart disease in patients over 70 years of age.[24,25]

Although there tends to be an emphasis on the subclinical and generally 'benign' nature of the carditis in adults, the fulminant cases described here, and in other series, should not be forgotten.[25]

ARF 'bites the heart and licks the joints in children' and 'licks the heart and bites the joints in adults'.[3] This aphorism has been supported by numerous investigators in the developed world. That this may not be so in less developed countries or warmer climes is suggested by this and other studies (Table III). The 60% incidence of valvular lesions following an initial attack is similar to that for all ages.[11,26] This high incidence of valvular involvement in adults is contrary to other reports, which suggest a decline in carditis;[3,6,10,25,27] echocardiography may yield new data on the incidence of valve lesions in the acute phase of the disease.[23]

Although this trend has been ascribed to socio-economic conditions and health care, the low numbers of blacks in this series suggests that another explanation should be sought since they live in the lowest socio-economic conditions in this country. Recent reports suggest that strains of certain M-types of *Streptococcus* may precipitate rheumatic fever with a high incidence of carditis in communities with good socio-economic conditions.[23]

Prolonged bed rest was most often required in the 30% of patients who had an 'additive' pattern of arthritis. While salicyclates have been shown to have a dramatic effect in the treatment of arthritis in adult ARF, side-effects limited its effectiveness and in this study NSAIDs were found to be a satisfactory substitute.

The problem of prophylaxis is not easily resolved.[3,20,28] The risk of recurrence does increase with age and also with increasing interval from the last attack;[28,29] however, there is a significant risk of recurrence for 5 - 10 years after an attack, and anyone with significant heart disease or repeated recurrences should be carefully reviewed before prophylaxis is

TABLE III. VALVULAR DISEASE DOCUMENTED IN OTHER STUDIES OF RHEUMATIC FEVER IN ADULTS

Reference	Patients with previous RHD	No. of patients developing new lesions	Patients with no previous RHD	No. of patients developing new lesions
Ben Dov and Berry[3]	11	—	9	—*
McDanald and Weisman[4]	1	—	5	—
Leirisalo and Laitinen[21]	3	—	26	8†
Adatto *et al.*[25]	10	3	24	1‡
Begg *et al.*[26]	54	—	85	5§

Patients' ages ranged from 12 years to 60 years.
* One patient was found at follow-up to have developed mitral stenosis.
† Three of these patients developed significant lesions.
‡ Patient developed a new valve lesion and experienced a significant worsening of existing lesion.
§ No distinction made between patients with pre-existing and new valve lesions.

stopped.[3,28,29] Patients who have rheumatic heart disease, or those with recurrent attacks with or without carditis, should be considered for indefinite prophylaxis. This is especially so in those who live in poor social circumstances or those who may be exposed to repeated streptococcal infections, such as school teachers and military personnel.[28]

The cases described above should alert the physician to the fact that, although adults with ARF may present primarily with arthritis, the possibility of a significant valvular disease — with its attendant morbidity — remains a real possibility.

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REFERENCES

1. Friedberg CK. Rheumatic fever in the adult: criteria and implications. *Circulation* 1959; **19:** 161-164.
2. Stollerman GH. Factors determining the attack rate of rheumatic fever. *JAMA* 1961; **177:** 823-828.
3. Ben Dov I, Berry E. Acute rheumatic fever in adults over the age of 45 years. *Semin Arthritis Rheum* 1980; **10:** 100-109.
4. McDanald EC, Weisman MH. Articular manifestations of rheumatic fever in adults. *Ann Intern Med* 1978; **89:** 917-920.
5. Barnert AL, Terry EE, Persellin RW. Acute rheumatic fever in adults. *JAMA* 1975; **232:** 925-928.
6. Annager JF, Pillman NL. Weidman WH, Kurland LT. Rheumatic fever in Rochester, Minnesota, 1935-1978. *Mayo Clin Proc* 1982; **57:** 752-757.
7. Council on rheumatic fever of the American Heart Association. Jones criteria (modified) for guidance in the diagnosis of rheumatic fever. *Mod Concepts Cardiovasc Dis* 1955; **24:** 291-294.
8. Jones TD. Diagnosis of rheumatic fever. *JAMA* 1944; **126:** 481-484.
9. Stollerman FH, Markowitz M, Taranta A, Wannamaker LW, Whittemore R. Jones criteria (revised) for guidance in the diagnosis of rheumatic fever. *Circulation* 1965; **32:** 664-668.
10. Wee AGT, Goodwin JG. Acute rheumatic fever and carditis in older patients. *Lancet* 1966; **2:** 239-242.
11. Stollerman GH. *Rheumatic Fever and Streptococcal Infection.* New York: Grune & Stratton, 1975: 147-175.
12. Elster SK, Pader E. Studies on acute rheumatic fever in the adult: II. The rebound phenomenon. *Ann Intern Med* 1959; **51:** 339-358.
13. World Health Organisation. Rheumatic fever and rheumatic heart disease. *WHO Tech Rep Ser* 1988; No. 764.
14. Davis E. Criteria of rheumatic fever. *Lancet* 1970; **1:** 1043-1045.
15. Stanhope JM, Clarkson PM, Philipp R. Diagnostic criteria of rheumatic fever in a New Zealand community. *Aust NZ J Med* 1981; **11:** 234-242.
16. Burch GE, Giles TD, Colcolough MD. Pathogenesis of rheumatic heart disease: critique and theory. *Am Heart J* 1970; **80:** 556-561.
17. Okuni M. Problems in the clinical application of the revised Jones criteria for rheumatic fever. *Jpn Circ J* 1975; **39:** 157.
18. Nair DV. Diagnosis of rheumatic fever. *Jpn Circ J* 1975; **39:** 159.
19. Ward C. Observations in the diagnosis of isolated rheumatic carditis. *Am Heart J* 1976; **91:** 545-555.
20. Persellin RH. Acute rheumatic fever: changing manifestations. *Ann Intern Med* 1978; **89:** 1002-1003.
21. Leirisalo M, Laitinen O. Rheumatic fever in adult patients. *Ann Clin Res* 1975; **7:** 244-254.
22. Gould L, Guttman AB. Recurrent mitral stenosis in the adult — the contributory role of rheumatic endocarditis. *Dis Chest* 1968; **54:** 146-150.
23. Veasy GL, Weidmeier SE, Orsmund CS *et al.* Resurgence of acute rheumatic fever in the intermountain area of the United States. *N Engl J Med* 1987; **316:** 421-426.
24. Currens JH. Rheumatic heart disease from ages 71-90. *JAMA* 1967; **199:** 185-187.
25. Adatto IJ, Poske RM, Pouget SM, Pilz CF, Montgomery MM. Rheumatic fever in the adult. *JAMA* 1965; **194:** 1043-1048.
26. Begg TB, Kerr JW, Knowles BR. Rheumatic fever in adolescents and adults. *Br Med J* 1962; **2:** 223-227.
27. Shaper AG. Cardiovascular disease in the tropics: I. Rheumatic heart disease. *Br Med J* 1972; **4:** 683-686.
28. Stollerman GH. Rheumatic fever and the inheritable connective tissue diseases of the cardiovascular system. In: Braunwald E, ed. *Heart Disease,* 3rd ed. Philadelphia: WB Saunders, 1988: 1706-1717.
29. Johnson EE, Stollerman GH, Gossman BJ. Rheumatic recurrences in patients not receiving continuous prophylaxis. *JAMA* 1964; **190:** 407-413.