Acute Rheumatic Fever in a South Florida County Hospital, 1967-1971

By Dolores M. Tamer, M.D.

SUMMARY
It has been previously reported that the incidence of acute rheumatic fever (ARF) in South Florida is less than in other metropolitan areas of the United States. It has been suggested that when acute rheumatic fever does occur the morbidity and mortality are significantly decreased. A five-year retrospective study of hospitalized cases revealed 98 episodes of ARF in 95 patients. The clinical manifestations paralleled data from recent surveys in two northern cities and included arthritis in 78 episodes, carditis in 54, chorea in two, and erythema marginatum and subcutaneous nodules in one case each. There were three deaths due to malignant pancarditis. Clinical, laboratory, and demographic data were also similar for this group and indicate rheumatic fever in Miami is not unlike the pattern of illness in other endemic areas of this country.

Additional Indexing Words:
Rheumatic fever Geography Rheumatic heart disease Climate

SASLAW ET AL. reported in 1954 that acute rheumatic fever (ARF) occurs infrequently in Southern Florida and with a lower morbidity when compared to temperate areas of the United States.1 On the other hand, subtropical and tropical areas outside this country continue to report a high prevalence of ARF.2-4 These reports record not only high mortality rates but also severe residual rheumatic heart disease often with early development of mitral stenosis in children.5 Because of these reports, the frequent occurrence of acute rheumatic fever in North Florida observed by Drs. Schiebler, Ayoub, and associates at the University of Florida at Gainesville (personal communication) and like reports from other southern states, a retrospective study of the clinical manifestations of ARF in a Miami, Florida, county hospital was undertaken.

The Miami metropolitan area has a population of 1.26 million inhabitants. There are a quarter of a million children in the public school system, which is sixth largest in the United States. The Jackson Memorial Hospital serves the indigent of the county as a free facility. Within five miles of the hospital the population is estimated to be 500,000 inhabitants, a large proportion of whom live in crowded predominantly black ghetto areas.

Methods
The records of cases hospitalized with ARF between January 1, 1967, and December 31, 1971, were reviewed. Ambiguous cases were eliminated so that the modified Jones criteria6 were satisfied in all remaining cases. Of the 169 charts initially recovered, 42 were unsatisfactory because of incorrect coding of chronic rheumatic heart disease, 19 involved non-specific febrile illness, and two cases had the diagnosis changed to rheumatoid arthritis after discharge. Four episodes of arthritis in patients with sickle cell disease not shown to be associated with prior streptococcal illness were excluded. Four possible recurrent episodes based on history of sore throat, fever, and arthralgia obtained in outpatient evaluations were excluded because supportive laboratory evidence was lacking. Review of out-patient records of these patients allowed a follow-up period of two to seven years.

Results
There were 98 episodes of ARF over the five year period. Three children had a second episode of ARF during this time, so that there were 95 patients included in this survey. In 77 patients this was the first attack of ARF, while in 21 the episode represented a recurrence. The ages ranged from five to 48 years, with the majority (81/98) under 15 years of age. There were 12 white and 83 black patients. The geographic distribution of cases was such that most (74/95) of the patients lived in the predominantly black neighborhoods of the central and northwest sections of Miami. Eight cases were referred from outside Dade County and six children arrived from the migrant labor camps southwest of the city. There was no seasonal fluctuation as cases were evenly distributed over the calendar year.
The clinical manifestations are summarized in Table 1. Polyarthritis was present in 74 episodes, and carditis in 54. Chorea occurred in two patients, erythema marginatum in one patient, and subcutaneous nodules in another. A history of prior joint trauma was present in eight instances, and nonspecific chest and abdominal pain occurred in 14 and six cases, respectively. Four patients had associated sickle-cell disease; one patient had glucose-6-phosphate dehydrogenase deficiency and subsequently developed severe anemia coincidental with salicylate therapy. Transient microscopic hematuria was recorded in six instances. Significant fluid accumulation in affected joints led to aspiration in 12 patients. The synovial fluid was characterized by polymorphonuclear leucocytosis (7,000 to 57,000 WBC/mm³), normal chloride and sugar, and all cultures were sterile.

The cardiac involvement is summarized in Table 2. Mild carditis was defined by clinical evidence of mitral insufficiency (22 cases); moderate carditis included additional aortic insufficiency or cardiac enlargement (19 cases). Severe carditis presented with clinical evidence of heart failure and was found in 13 cases.

Three children died from causes secondary to acute rheumatic fever during this time period: one, suddenly in pulmonary edema on the tenth day of illness; another, after six months of chronic intractable heart failure; and the third, following discharge to a convalescent hospital. Two of these children had severe mitral disease and there was combined aortic and mitral insufficiency in the third. Postmortem examination revealed evidence of fulminating myocarditis and valvulitis in all cases.

A review of cases two to seven years after the attack revealed that one-third were lost to follow-up. Twenty-seven of the remaining had residual rheumatic heart disease. No patient developed mitral or aortic valve stenosis during this period. Five patients who originally developed mitral insufficiency had no evidence of heart disease upon follow-up examination. Two children later developed bacterial endocarditis, and four patients developed allergic reactions to penicillin, none serious. (Table 3)

Recurrent episodes of ARF accounted for 21 admissions during the 1967-71 period. Two of these cases had documented evidence that 1.2 million units of long-acting benzathine penicillin had been given four to ten days prior to recurrence and yet group A (by Bacitracin disc sensitivity) streptococcal bacteria were isolated in their throat cultures.

### Table 1

<table>
<thead>
<tr>
<th>Clinical Findings in 98 Episodes of Acute Rheumatic Fever</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>83</td>
</tr>
<tr>
<td>Polyarthritis, no carditis</td>
<td>42</td>
</tr>
<tr>
<td>Polyarthritis and carditis</td>
<td>32</td>
</tr>
<tr>
<td>Monoaarthritis and carditis</td>
<td>4</td>
</tr>
<tr>
<td>Carditis without arthritis</td>
<td>18</td>
</tr>
<tr>
<td>Chorea</td>
<td>2</td>
</tr>
<tr>
<td>Erythema Marginatum</td>
<td>1</td>
</tr>
<tr>
<td>Chest pain (non specific)</td>
<td>14</td>
</tr>
<tr>
<td>Abdominal pain (non specific)</td>
<td>6</td>
</tr>
<tr>
<td>History of joint trauma</td>
<td>8</td>
</tr>
<tr>
<td>Elevated* ASO titer</td>
<td>80</td>
</tr>
<tr>
<td>Elevated ESR or CRP</td>
<td>90</td>
</tr>
<tr>
<td>Abnormal ECG</td>
<td>28</td>
</tr>
<tr>
<td>Leucocytosis†</td>
<td>43</td>
</tr>
<tr>
<td>Positive streptococcal culture</td>
<td>23</td>
</tr>
<tr>
<td>Prior sore throat or URI</td>
<td>31</td>
</tr>
<tr>
<td>Sickle cell disease</td>
<td>4</td>
</tr>
<tr>
<td>G-6-PD deficiency</td>
<td>1</td>
</tr>
<tr>
<td>Microscopic hematuria</td>
<td>6</td>
</tr>
</tbody>
</table>

*Over 250 Todd units.
†White blood cell count over 10,000/mm³.

Abbreviations: ASO = Antistreptolysin O titer; ESR = Erythrocyte sedimentation rate; CRP = C-Reactive protein; URI = Upper respiratory infection; g-6-PD = Glucose 6-phosphate dehydrogenase.

### Table 2

<table>
<thead>
<tr>
<th>Carditis in Acute Rheumatic Fever, Jackson Memorial Hospital 1967-71</th>
</tr>
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<tbody>
<tr>
<td>No.</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>Mitral insufficiency</td>
</tr>
<tr>
<td>Mitral &amp; aortic insufficiency</td>
</tr>
<tr>
<td>Aortic insufficiency</td>
</tr>
<tr>
<td>Heart failure</td>
</tr>
<tr>
<td>Pericarditis</td>
</tr>
<tr>
<td>Total number of patients</td>
</tr>
</tbody>
</table>

### Table 3

<table>
<thead>
<tr>
<th>Late Results in Acute Rheumatic Fever, Jackson Memorial Hospital, 1967-71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Rheumatic heart disease</td>
</tr>
<tr>
<td>Mitral insufficiency</td>
</tr>
<tr>
<td>Mitral and aortic insufficiency</td>
</tr>
<tr>
<td>No heart murmur</td>
</tr>
<tr>
<td>Expired</td>
</tr>
<tr>
<td>Lost to follow-up</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
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more temperate areas of the United States. Similarities included the presenting symptomatology, frequency, and severity of carditis, supportive laboratory data, and case mortality. The relative frequency of chorea was less than previously cited by Bland and Jones in our series as well as other recent United States surveys. The low incidence of chorea could possibly be due to the following factors: 1) early recognition and treatment of streptococcal disease, 2) the effect of continued prophylaxis with a decrease in the chorea seen formerly in recurrences of ARF, or 3) an actual change in the clinical pattern of ARF.

Cardiac involvement during episodes of ARF in this group of patients was not unlike the manifestations reported in retrospective surveys in Cleveland, Ohio, and Washington, D.C. In a prospective study, Sanyal and associates also reported cardiac involvement in a similar proportion of children of New Delhi in Northern India. However, in sharp contrast, recent reports of ARF in a rural Mississippi community and in Karachi, Pakistan, cite a higher proportion of cases with carditis and much higher mortality rates. From this perspective, our series demonstrated a rate and severity of ARF similar to that reported in industrialized countries and other American metropolitan areas, rather than the pattern of findings reported in impoverished, rural areas in the south or in other subtropical countries. Here, the inadequacy of the reporting of mild cases is recognized. This may lead to a disproportionately high estimate of the severity of the cases reported.

Climate and geography appear to bear little relationship to the occurrence and severity of ARF in Miami as elsewhere. Socioeconomic factors such as poverty, overcrowded living conditions, and lack of medical care have been shown to play major roles in areas where rheumatic fever has a high incidence. The patients in the current series were predominantly black, five to fifteen years of age, and living in crowded inner-city neighborhoods. The proportion of recurrences was higher than usually cited, and the number lost to follow-up was high although of the same order of magnitude for the Maryland rheumatic fever registry.

The total cost to the community for the hospital care of these ARF patients over the five-year period approached a quarter of a million dollars. Adding the cost for continued care or surgery because of chronic rheumatic heart disease at least doubles that amount and changes our perspective of rheumatic fever as a community health problem in this area.

The question of whether the incidence or severity of ARF in Miami has actually changed over the years is impossible to answer from the data at hand. An actual accounting of hospital or physician case records may define two or three times the number reported to public health offices. We believe the cases seen at this county hospital represent only the least estimate of total incidence in this area. Qualitatively, these data indicate that the disease does not differ in its clinical manifestations from other metropolitan areas and indicates that efforts to detect and follow patients with rheumatic fever be pursued with the same energy here as elsewhere.

References

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