Editorial

Rheumatic Fever in the Adult: Criteria and Implications

That there is no specific test for rheumatic fever is well known. This would require no emphasis were it not for the dogmatism with which this diagnosis is often made at the bedside on the basis of nonspecific clinical findings. The report of the Council of Rheumatic Fever entitled "Jones Criteria (Modified) for Guidance in the Diagnosis of Rheumatic Fever" states clearly, "There is no specific laboratory test. The diagnosis must therefore be arbitrary and empirical." In a disease with the serious implications of rheumatic fever, a diagnosis that is necessarily "arbitrary and empirical" calls for caution and restraint, not dogmatism.

This editorial is prompted, in part, by a large and continuing experience with overdiagnosis of rheumatic fever, especially in adults beyond the age of 25. More particularly it is intended to cast doubt on the belief that rheumatic fever in such adults is frequently followed by rheumatic cardiovascular disease as it is in children. Overdiagnosis is usually due to failure to adhere to established diagnostic criteria such as those of the Council on Rheumatic Fever or to realize the limitations of the so-called major criteria and the nonspecific character of the so-called minor criteria, such as increased erythrocyte sedimentation rate, presence of C-reactive protein, and prolongation of the P-R interval of the electrocardiogram. Diagnostic error has also resulted from equating an elevated titer of antistreptolysin in the serum with active rheumatic fever, instead of limiting its significance to preceding infection with the hemolytic streptococcus.

The diagnosis of rheumatic fever is regarded as highly probable in the presence of at least 2 of the 5 major criteria. Chorea, subcutaneous nodules, and erythema marginatum, which form the 3 most distinctive and specific major criteria, are observed relatively frequently in children with rheumatic fever, but rarely in adults beyond the age of 25. Thus in adults the diagnosis must rest on the basis of the fourth major criterion, arthritis, a nonspecific manifestation of varied cause, and the fifth criterion, carditis, the occurrence of which is difficult to demonstrate in the adult.

In most adults past 25, the diagnosis of rheumatic fever is based on the diagnosis of arthritis alone. Its rheumatic etiology is justified by exclusion of other causes of arthritis, by the therapeutic effect of salicylates on the arthritis and the associated fever, and often also by the history of a preceding sore throat and the presence of a high titer of serum antistreptolysin. But diagnosis by exclusion may be unreliable because it is doubtful that we know all the forms of arthritis or that we can always distinguish the forms that are known. Not very long ago the arthritis associated with disseminated lupus erythematosus without the rash, arthritis associated with erythema nodosum and unrecognized ulcerative colitis, and arthritis associated with periarteritis nodosa or with sarcoidosis, to mention a few exam-
amples, were erroneously diagnosed as rheumatic fever. It is surprising how often a response to salicylates is regarded as convincing evidence of rheumatic fever.

There is inadequate awareness of the tenuous basis on which rheumatic carditis is diagnosed in the adult beyond the age of 25. According to the modified Jones criteria, carditis may be indicated by one or more of the following manifestations, all of which, in my experience are subject to conflicting interpretations:

A. Murmurs: a significant apical systolic murmur, apical diastolic murmur, or basal diastolic murmur, in the absence of previous rheumatic fever or pre-existing cardiovalvular disease; a change in character of the murmurs in individuals with previous rheumatic heart disease. The distinction between a significant and insignificant apical systolic murmur is almost always uncertain, especially during a febrile disease. Yet in practice the diagnosis of rheumatic carditis in adults is most commonly based on the presence of an apical systolic murmur or a presumed alteration in its character. Change in character of the murmur is a matter of subjective interpretation; there is frequent disagreement as to its occurrence. Other factors besides rheumatic valvulitis may account for the change. For these reasons change in the character of a systolic murmur should be abandoned as a criterion of rheumatic carditis. As for a diastolic murmur, its presence in the adult is almost always the result of preceding rheumatic fever and indicates mitral stenosis or aortic regurgitation; at least such an interpretation cannot be excluded.

B. Pericarditis. Since idiopathic pericarditis is being recognized with increasing frequency, the presence of pericarditis can no longer be regarded as specific evidence for rheumatic fever in the adult.

C. Congestive Heart Failure. Most physicians appear to be unaware that the modified Jones criteria quite properly list congestive heart failure as a criterion of rheumatic carditis only in patients below the age of 25. Beyond that age heart failure is most probably due to other causes that cannot be excluded.

D. Increasing Cardiac Enlargement, demonstrated by x-ray examination. In practice this is rarely the basis for a diagnosis of rheumatic carditis in the adult. When it occurs, it is most probably due to a nonrheumatic pericarditis or to congestive heart failure, and the latter cannot be regarded as indicating carditis in the adult. In summary, carditis, which would represent an essential criterion for the diagnosis of rheumatic fever in the adult beyond age 25, is either absent in cases diagnosed as rheumatic fever or it is based on unsatisfactory evidence.

These considerations raise doubt as to the reported frequency of rheumatic fever in the adult who has passed the age of 25. But even if the reported incidence is correct, one may question whether this disease in the adult portends the same dire consequences as in the child or warrants the same measures for prophylaxis and treatment. The clinical importance of rheumatic fever is dependent, not on the arthritis, the chorea, the subcutaneous nodules, and the erythema marginatum, which virtually always subside without residuals, but on the cardiac involvement and the serious consequences of subsequent rheumatic cardiovalvular disease. Rheumatic fever in the child is followed in a large majority of cases by chronic cardiovalvular disease. In a series of 1,000 cases followed by Bland and Jones,\(^2\) 65.3 per cent had signs of valvular disease on recovery from the initial illness, whereas 44 per cent of the remainder had acquired signs of valvular disease by the end of 20 years. If rheumatic fever in the adult over 25 is to be regarded as an equally significant disease, it must be demonstrated that it, like the disease in childhood, is followed in the majority of cases by chronic rheumatic cardiovalvular disease. In more than 20 years I have never observed a patient with so-called rheumatic fever after the age of 25 who, when first seen, had no history of rheumatic fever or signs of valvular heart
disease and yet subsequently developed signs of chronic rheumatic cardiovalvular disease. In patients with pre-existing valvular disease, evaluation of possible further rheumatic valvular damage is extremely difficult and I have seen no unequivocal example of such an occurrence in the adult.

These experiences have led to the belief that the so-called rheumatic fever in the adult past 25 differs in some essential manner from that in the child or, perhaps more likely, that it differs in failing to elicit the cardiac response, which is the important feature of the disease. The most reliable evidence of significant rheumatic fever is the development of mitral stenosis or aortic regurgitation following the attack, as a rule within 1 or 2 years. Since such a sequence has not been demonstrated in the adult to my knowledge and has not occurred in my experience, it is questionable whether the adult type of arthritis which is termed rheumatic fever should be given this name with its ominous implications of cardiovalvular disease. It may be preferable to diagnose it as idiopathic arthritis or, if it follows a (hemolytic) streptococcus A infection and is associated with a very elevated serum antistreptolysin titer, it may be termed post-streptococcal arthritis.

Follow-up studies have indicated the preeminent importance of the diastolic murmur and the questionable importance of the systolic murmur in both children and adults with rheumatic fever.\(^3\) Sixty-six per cent of 96 children and adolescents without previous heart disease, in whom a definite diastolic murmur appeared or disappeared during the acute attack developed rheumatic heart disease within an average period of 4.8 years. Among 52 similar patients who developed a new, loud apical systolic murmur radiating to the axilla, or a questionable diastolic murmur, only 29 per cent developed rheumatic heart disease. Among adults with an initial attack of so-called rheumatic fever a new diastolic murmur is extremely rare. In many of the cases in which chronic rheumatic heart disease (mitral regurgitation) is diagnosed on the basis of an apical systolic murmur, one may question the diagnosis or the significance of the murmur. Thus, for 391 patients who had been diagnosed as having mitral insufficiency after an attack of rheumatic fever, the over-all annual mortality rate after the age of 20 was 2.76 per thousand which was not significantly different from the death rate of 3.1 per thousand in the United States population as calculated for the same age distribution.\(^4\) The comparable annual death rates for those with mitral stenosis and those with combined mitral and aortic lesions were 7.8 and 29 per thousand, respectively.

Frequently the diagnosis of rheumatic fever or rheumatic activation is made in the adult with rheumatic valvular disease on the basis of fever alone. Thus an erroneous diagnosis of rheumatic fever was commonly made in cases of bacterial endocarditis. In many patients with mitral stenosis who were awaiting operation mitral commissurotomy was denied or delayed too long because the presence of fever was wrongly interpreted to signify active rheumatic fever. In most such cases the fever was due to pulmonary embolism, patchy bronchopneumonia, or to viral bronchopulmonary infection. The development or progression of heart failure in the adult with rheumatic heart disease is often attributed to active rheumatic fever, especially if the patient is febrile. These diagnostic concepts are based on the traditional teaching that rheumatic fever is a persistent, chronic disease with a tendency to recrudescence throughout life. This teaching in turn was based on postmortem findings of Aschoff bodies in the myocardium of patients in the third to sixth decades who died of rheumatic heart disease and heart failure long after the overt, acute attacks of rheumatic fever. The Aschoff body was interpreted to signify active rheumatic fever. This interpretation and the concepts based on it are no longer tenable, since biopsy specimens of left atrial appendages have disclosed a high incidence of Aschoff bodies, without relation to the clinical picture and subsequent course, leading to the conclusion that the presence of Aschoff bodies cannot be regarded as evidence of
clinically active rheumatic fever. If further studies support evidence that there are fresh and senescent Aschoff bodies that can be differentiated by special stains, the fresh Aschoff body may be found to be acceptable as a pathologic criterion of clinically active rheumatic fever.

In conclusion, it is emphasized that rheumatic fever is a disease whose clinical and public health importance is based on the subsequent development, in about 75 per cent of cases, of mitral stenosis, aortic insufficiency, or both. In adults beyond the age of 25, rheumatic fever is rare when judged by this criterion of subsequent valvular disease. In such adults rheumatic fever should be diagnosed only when 2 of the major criteria of Jones (modified) are present, which mean essentially arthritis and carditis, but carditis in the adult should be diagnosed only on the appearance of a diastolic murmur not previously present. When nondeforming, febrile polyarthritis occurs without carditis in the adult after a streptococcus A infection, when it is associated with a high serum antistreptolysin titer, when it promptly responds to salicylate therapy, and when other causes of arthritis are excluded, it should be termed post-streptococcal arthritis, not rheumatic fever, because mitral stenosis and aortic regurgitation rarely if ever follow such arthritis. In order to avoid errors in diagnosis and treatment, unexplained fever, pericarditis, or congestive heart failure in adults with rheumatic heart disease should rarely if ever be attributed to activation of rheumatic fever. There is need for follow-up study of adults who experience their first attack of so-called rheumatic fever after the age of 25. If it can be demonstrated that the characteristic valve lesions follow post-streptococcal arthritis in adults as frequently as in children, the traditional concept of rheumatic fever can be re-instituted. But in the absence of such evidence the serious prognosis with respect to subsequent cardiac disturbance, the prolonged inactivation, and the continuous prophylactic therapy for rheumatic fever in childhood do not appear warranted in the adult past the age of 25.

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Sydenham was called 'a man of many doubts,' and therein lay the secret of his great strength.—WILLIAM OSLER, M.D. British Medicine in Greater Britain. Montreal Med. Journal, 1897.