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Title: Clinical Characteristics and Outcomes of a Contemporary Cohort with Acute Rheumatic Fever from the Northeast Region of Brazil

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Background & Aims: Acute rheumatic fever (ARF) remains a significant health concern, particularly in low- and middle-income countries where it predominantly affects economically disadvantaged populations. The disease continues to pose a significant burden in Brazil, especially in regions facing socioeconomic challenges with limited access to accurate data and substantial underreporting. This study aimed to assess the clinical characteristics at diagnosis and the outcomes of a contemporary cohort of children with ARF in an endemic region of Brazil.

Methods: This retrospective single-center cohort study included consecutive cases of ARF admitted to a referral hospital for treatment. The cases were identified through hospital admission records spanning a decade (2012-2022). The diagnosis of ARF was made based on the Jones criteria considering high risk populations by the local physician team responsible for patient care and subsequently reviewed by the principal investigator to ensure data consistency. Evidence of antecedent group A streptococcal infection was determined based on the patient's medical history and increased anti-streptolysin O titer. Both initial and recurrent episodes of ARF were included in the analysis. Follow-up data was obtained from medical records. The study outcome was defined as the need for cardiac surgery or death during hospitalization.

Results: Out of the 914 children admitted with suspicion of ARF, 122 children met the diagnostic criteria and were included in this study. The mean age at diagnosis was 9.8 ± 3.2 years (ranging from 2 to 15 years) and 61 (50%) were female. At the time of hospital admission, the majority of patients presented with fever and elevated C-reactive protein values. Carditis was observed in 71 patients (58.2%), followed by polyarthralgia in 58 patients (47.9%), chorea in 45 patients (36.9%), subcutaneous nodules in 4 patients (3.3%), and erythema marginatum in 3 patients (2.5%). The mean anti-streptolysin O titer was 769 unit/mL, ranging from 200 to 11183 unit/mL. Severe mitral valve regurgitation was detected in 35 patients (28.7%), with 5 of them having associated severe aortic regurgitation. Significant mitral stenosis was detected in 6 patients (4.9%). The pattern of valve involvement is presented in Figure 1. During hospitalization, 17 (13.9%) patients developed heart failure and required surgical intervention. The main reasons for surgery were chordal rupture, leading to severe mitral regurgitation in 14 patients (82.4%) and associated severe aortic regurgitation in other 3 patients (17.6%). Additionally, 2 patients (1.6) died during their hospital stay with an overall rate of adverse outcome of 15.6%. The presence of carditis at hospital admission was associated with worse outcomes (odds ratio 2.07, 95% confidence interval 1.46-2.92, $p < 0.001$).

Conclusions: This contemporary cohort of ARF provides valuable insights into the local disease epidemiology and its impact. The findings indicate that approximately one-third of the cases resulted in severe valvular lesions, highlighting that in many cases diagnosis may be delayed. These observations underscore the need for improved awareness, early detection, and effective management strategies for ARF in affected regions, with the ultimate goal of reducing the occurrence and severity of valvular damage.