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Short Communication

Acute Rheumatic Fever in Children: A Real Public Health Problem in Developing Countries

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Abstract

Acute Rheumatic Fever still gives rise to serious public health issues given the disparate epidemiology in between geographic areas and the variability of clinical presentations.

The risk of relapse also raises the question of secondary prophylaxis by penicillin G benzathine.

Keywords: *Rheumatic Fever; Rheumatic Heart*

Acute rheumatic fever (ARF) is still a public health problem in developing countries because of its high prevalence and the occurrence of rheumatic heart disease (RHD).

Hygienic conditions of the indigenous populations, overcrowding, socioeconomic disadvantage, and decline in the living standard may suggest an increase in ARF cases in the coming years [1,2]. Around the world, there are over 15 million cases of RHD, with 282,000 new cases and 233,000 deaths each year.

High prevalence is observed in some countries such as Zambia (12.6 per thousand), Sudan (10.2 per thousand) and Egypt (5.1 per thousand) [3]. In Morocco, during the past decade (2000 - 2010) 63,622 cases of ARF were reported by the monitoring system. School aged children (5 - 14 years) are the most affected (36.3%) [4]. The average incidence in this age range of children was 33.1 per 100,000. In a hospital setting, ARF frequency ranged from 4.7 to 6.5% [5].

This disease often occurs amongst school-age youngsters, rarely children aged < 5 years yet with a higher risk of cardiac involvement [6,7]. Clinical manifestations are extremely various and may also be different from one series of case studies to another [8]. Joint signs are the earliest manifestations with polyarthritis occurring 1 - 3 weeks after a streptococcal infection that is not always symptomatic and goes unnoticed.

Differential diagnosis is often a major concern in monoarticular forms and may even in some cases lead to unnecessary punctures or biopsies. Fever (38 - 39°C) and moderate deterioration of general condition are the most frequent systemic adverse events.

Despite being less common and inconstant, cutaneous signs hold an important diagnostic value. Neurological signs are characterized by Sydenham's chorea, which occurs late 2 to 6 months after streptococcal infection. Cardiac involvement often involves the endocardium and is manifested by mitral regurgitation or both mitral and aortic regurgitations. Congestive heart failure signs, which have become exceptional, reflect extensive involvement of the myocardium and endocardium.

The diagnostic criteria are divided into major and minor although some atypical presentations may not be included in the classification. This may result in underdiagnosis of ARF, with a consequent high risk of delayed diagnosis including cardiac complications and confusion with other differential diagnoses [9]. Since their formulation by Jones in 1944, these criteria have been regularly modified and their latest revision in 1992 included evidence of streptococcal infection [10]. When performing laboratory tests, an inflammatory syndrome must be sought. It is manifested by the significant increase in erythrocyte sedimentation rate, elevation of fibrinogen, high level of C reactive protein, polymorphonuclear leukocytosis and moderate inflammatory anemia.

Markers assessing for group A streptococcal pharyngitis should be checked on bacteriological examination of throat swabs: rapid antigen detection test and streptococcal serology. Rapid detection test; with immunofluorescence technique, test-positive results are seen in 90% of patients with acute rheumatic fever. Serologies combining several group A anti-streptococcal antibodies would give better sensitivity [11].

Electrocardiographic findings are not specific for ARF. Chest X-ray may reveal a cardiomegaly secondary to pericarditis, myocarditis, or advanced valvulopathy. It sometimes shows signs of pulmonary stasis. Transthoracic Doppler echocardiography allows complete anatomical and functional assessment of valvulopathies. It is considered to be the reference diagnostic method for establishing positive diagnosis of rheumatic valvulopathies by specifying the anatomical mechanism of the leak or stenosis, quantifying valvular dysfunction and appreciating its repercussions [12,13]. Doppler ultrasound is also considered a reliable mean to diagnose subclinical rheumatic heart disease [14].

Treatment of ARF includes three goals: streptococcal eradication, long-term secondary prophylaxis and symptomatic treatment of acute manifestations.

A hospital admission is recommended urgently for patients with acute relapse since progression to heart failure is unpredictable. Corticosteroids have a comparable efficacy profile compared to salicylate and there is no consensus about a preferential anti-inflammatory therapy up until now.

Apart from cases presenting with cardiac involvement, prednisone is used at 2 mg/kg/day given once daily in the morning during 2 to 3 weeks, usually until the levels of inflammatory molecules normalize. Then dosage is decreased within a total period of 7 to 10 weeks. Monitoring covers the temperature curve, weight, blood pressure measurement, erythrocyte sedimentation rate and the C-reactive protein level each week.

Salicylate can be used as a treatment for ARF in the absence of carditis. Other non-steroidal anti-inflammatory treatments are also used especially if salicylate effects are intolerable. Patients with cardiac involvement respond favorably to prednisone. It is usually the drug of choice; being prescribed for 3 to 4 weeks followed by maintenance therapy for 8 to 12 weeks.

Secondary prophylaxis is essential as it prevents recurrences. The reference treatment is intramuscular benzathine penicillin G repeated every 3 weeks. This prophylaxis should be maintained lifelong in patients with carditis. It could be stopped at least 5 years after the last relapse in subjects who have never had carditis. In case of penicillin allergy, erythromycin 250 mg twice daily should be prescribed.

A number of barriers prevent adherence to medication. They arise on two fronts: cultural and organizational factors. Anaphylactic shock phobia, pain associated with injections are often found as well as health care access issues [15].

Primary prevention must remain integrated into the basic health care programs in high-prevalence countries. Early adequate management can reduce irreversible cardiac complications.

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