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ORIGINAL ARTICLE

Atypical arthritis in children with rheumatic fever

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Abstract

Introduction: the diagnosis of acute rheumatic fever remains a difficult medical task mainly due to the polymorph clinical manifestation and the lack of a specific laboratory marker. Although arthritis is the most frequent finding in these cases, it is the least specific manifestation. In addition, classical acute migratory polyarthritis involving large joints is not always present.

Objective: the aim of this study was to describe the clinical manifestations and to assess the occurrence of atypical arthritis in patients with acute rheumatic fever attending a pediatric rheumatology service at the Hospital das Clínicas de Ribeirão Preto, São Paulo, Brazil.

Methods: we retrospectively studied the records of 120 attacks of acute rheumatic fever in 109 children, from 3 to 13 years of age, who were seen at our service from January 1990 to December 1995. All children fulfilled the Jones criteria.

Results: seventy-seven percent of the acute rheumatic fever attacks presented arthritis, 62% carditis, 32% chorea, 2.5% subcutaneous nodules, and 1.3% erythema marginatum. The number of involved joints was one in three episodes of acute rheumatic fever; two to five in 52 cases; six to ten in 30; and more than ten in five cases. An atypical pattern was observed in 43 out of the 92 (47%) acute rheumatic fever episodes with arthritis, based on the following criteria: involvement of unusual joints (cervical spine in 24 children, hip in 15, small joints of the hand in 12, and feet in 13); monoarthritis (in three cases); duration longer than 3 weeks (in 26 patients); incomplete response to salicylates (in 18 children). Association of these atypical features was frequently present. For instance, considering the 24 episodes with cervical spine involvement, the duration of arthritis was longer than 13 weeks in 13 cases, 10 had insufficient response to salicylates, and the hip joint was also involved in other seven cases. The time to reach diagnosis was longer than 4 weeks in 59% of the patients presenting atypical arthritis when compared to 35% in the other patients (P=0.04). Other diagnoses were initially considered in 40% of the 120 acute rheumatic fever attacks, and in 65% of the patients who presented atypical arthritis (P=0.03).

Conclusion: We concluded that atypical arthritis was present in a significant proportion of the acute rheumatic fever attacks, making the diagnosis of this intriguing disease even more difficult.

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Introduction

Acute rheumatic fever, a disease known for over a century (it was first described in 1889),[1] still represents one of the most difficult diagnoses in pediatrics. There is no specific clinical pathognomic sign or laboratory test

established to confirm its diagnosis; thus, the diagnosis depends on the fulfillment of Jones criteria, established in 1944.[2] These criteria were successively modified by several authors, and the last review dates back to 1992.[3] In these criteria, arthritis is the least specific one despite being the most frequent symptom (it affects around 53 to 84% of patients in Brazil),[4] and having given the name to the syndrome ("rheumatic" fever). Consequently, arthritis - especially when it occurs isolatedly - is associated with an increased difficulty of diagnosis.

The classical description of joint involvement in acute rheumatic fever consists of a clinical status of migratory polyarthritis, which affects especially the large joints of the lower limbs and appears around 2 to 3 weeks after oropharyngeal streptococcal infection. The pain, typically intense and disproportional to the signs observed on physical examination, can be quickly reduced with the use of nonsteroidal anti-inflammatories, notably salicylates. Without treatment, the signs of inflammation normally last from 2 to 5 days in each joint, with the possibility of simultaneous involvement of different joints. These signs usually do not last more than 3 weeks.[5-8] Arthritis characteristically heals without sequelae.[9]

Situations in which these characteristics were not observed have been increasingly reported.[7,8] The presence of atypical articular status makes the diagnosis of acute rheumatic fever even more difficult, and thus it is necessary to carry out accurate differential diagnosis, especially in cases in which other important and more specific criteria (carditis and chorea) are not present.

The objective of the present study is to describe the clinical characteristics and the occurrences of atypical arthritis in children who received treatment at the Hospital das Clínicas de Ribeirão Preto, São Paulo, Brazil, during an acute attack of acute rheumatic fever.

Patients and methods

We retrospectively analyzed 171 medical records of outpatients and inpatients who were treated at the Hospital das Clínicas de Ribeirão Preto, teaching hospital of the Medical School at the Universidade de São Paulo and with diagnosis of rheumatic fever (ICD code 390 to 392 for active acute rheumatic fever and 393 to 398 for chronic rheumatic heart disease). Our study was carried our for a period of 6 years from January 1990 to December 1995.

Out of the 171 records analyzed, we selected 109 that fulfilled the following criteria: log of treatment to the acute attack in the medical report (first attack or recurrence); diagnosis of acute rheumatic fever based on the 1992-updated Jones criteria;[3] age limit of 13 years. As a result, we filled out a number of 120 protocols, which corresponds to that of attacks of the 109 patients during the study.

We designed a protocol including the following items: personal information; Jones major and minor criteria; time to diagnosis; other initial hypotheses of diagnosis; and information regarding evidence of previous infection by streptococcus (history, ASLO, culture). In order to classify joint involvement as atypical, at least one of the following characteristics had to be present: duration longer than 3 weeks; involvement of small joints and/or cervical spine and/or hip joints; presence of monoarthritis; and unsatisfactory response to salicylates.

We carried out a descriptive analysis of the results. Comparison of the time to diagnosis and the presence of other initial diagnoses in typical and atypical arthritis attacks was carried out using the chi-square test with $P<0.05$.

Results

We reviewed the medical reports of 109 patients, 61 males and 48 females (1.3:1.0 ratio). Patient age at first attack ranged from 3 to 13 years of age for an average of 9.4 years.

During the observation period, 99/109 (90.8%) patients presented only one attack of acute rheumatic fever; 9 (8.2%) presented two attacks; and 1 presented three, for a total of 120 attacks. We observed an average yearly incidence of 20 attacks, out of which most were the first episode of acute rheumatic fever (88/120). Out of the remaining 32 attacks, 26 were related to recurrences of the disease. In the other 6 cases, it was not possible to determine, with the data available on medical records, whether they were recurrences or first attacks.

The frequency of Jones major criteria was as follows: arthritis in 92 attacks (77%), carditis in 74 (62%), chorea in 38 (32%), subcutaneous nodules in 3 (2.5%), and erythema marginatum in 2 (1.7%). Arthritis occurred isolatedly in ten of the 92 attacks (10.8%) and in the other 60 cases (65%) it was associated with carditis.

As for the number of joints involved, we found that there were 3/92 (3.3%) attacks with monoarthritis (one affecting the hip and two the knee); 52 (56.5%) involving from two to five joints; 30 (32.6%) from six to ten joints; and 5 (5.5%) involving more than ten joints. Table 1 presents a list of the most affected joints.

In relation to the characteristics of joint involvement, an atypical pattern was observed in a considerable percentage of the 92 attacks with arthritis (47%). Table 2 describes the distribution of these cases according to the criteria used to consider them atypical.

Table 3 lists the manifestations of acute rheumatic fever in these 43 cases according to Jones criteria. We observed that in five of the 43 attacks the diagnosis of acute rheumatic fever was based on the presence of arthritis as the only major criterion, which was considered atypical.

Table 1 - Distribution of the attacks presenting arthritis (n=92) according to the most commonly involved joints

Joints	n	%
Ankle	73	79
Knee	69	75
Small joints of the feet	29	32
Small joints of the hands	24	26
Cervical spine	24	26
Wrist	23	25
Elbow	17	19
Shoulder	17	19
Hip	15	16
Thoracic cord	10	11
Calcaneus	08	09
Lumbar cord	01	04)

The time between onset of symptoms and diagnosis of acute rheumatic fever was longer than 4 weeks in 26 patients (60%) with atypical arthritis. As for the other patients, it was longer than 4 weeks in 35% of cases. Other initial hypotheses of diagnosis had been considered in 40% of the 120 acute rheumatic fever attacks and in 65% of patients who suffered from atypical arthritis (P=0.03). Generally, in over half the cases (52.8%) diagnosis was established only 2 weeks after the onset of symptoms.

Discussion

In the present study, we analyzed the clinical characteristics and the occurrence of atypical arthritis in 120 attacks of acute rheumatic fever attended to at the Hospital das Clínicas de Ribeirão Preto, Teaching Hospital of the Universidade de São Paulo, between January 1990 and December 1995.

The number of attacks registered in a year (average of 20) gives us an idea of the importance of acute rheumatic fever as one of the reasons for which patients seek our services. For the sake of comparison, during the same time period (1990 to 1995), the average of patients with juvenile rheumatoid arthritis at our services was of 8 cases per year. Our data do not, however, represent the actual situation of acute rheumatic fever in the city of Ribeirão Preto, mostly because the Hospital das Clínicas is a center of reference and 60% of the cases analyzed came from other cities. It is also possible that many other cases of acute rheumatic fever were attended to at other services of the primary or secondary health care system of Ribeirão Preto.

Table 2 - Classification of atypical arthritis attacks (n=43) according to their presentation

Atypicality	n	%
Area*	32	74
Duration	26	61
Poor response to nonsteroidal anti-inflammatories	18	42
Duration + response	16	37
Duration + response + area	10	23
Number (mono)	03	07

* Cervical spine: 24; hip:14; small joints of the feet: 13; small joints of the hands: 12.

Table 3 - Classification of atypical arthritis according to Jones major and minor criteria

Criteria	n	%
A	05	12
A+CA	35	81
A+CO	03	07
A+CA+CO	03	07
A+CA+EM+NS	01	02
A+CA+EM	01	02
Fever	33	77
PIA	38	88
ASLO increased	38	88

A: arthritis; CA: carditis; CO: chorea; EM: erythema marginatum; SN: subcutaneous nodules; PIA: proof of inflammatory activity; ASLO: anti-streptolysin O.

In relation to the frequency of Jones major criteria, our findings were similar to those previously described in other regions of Brazil.[10-12]

Our results show that the diagnosis of acute rheumatic fever still posits some difficulties, considering that in over half the cases (52.8%) the time to diagnosis was of 2 weeks after the onset of symptoms. Moreover, in 40% of the attacks other initial diagnostic hypotheses had been considered, out of which 66% were related to arthritis - more importantly juvenile rheumatoid arthritis and reactive arthritis. It is also possible to observe that our results indicate a greater difficulty in the diagnosis of attacks that presented together with atypical arthritis, since the time to diagnosis in these cases was of more than 4 weeks in a significantly higher number of cases than in those of typical articular status; the same happened in relation to the occurrence of other initial diagnoses.

An atypical pattern of joint involvement was observed in practically half of the cases studied (47% of the 92 cases with arthritis), thus contributing to increase the difficulties of the initial diagnosis of acute rheumatic fever, as we mentioned earlier.

It is important to stress that in many cases we found an association between atypical characteristics. For example, involvement of the cervical spine occurred in 24 attacks; in 13 out of these 24 cases, it was associated with a duration longer than 3 weeks; in 10, it was associated with unsatisfactory response to nonsteroidal anti-inflammatory (salicylates); and in 7, with involvement of the hip joint (present in 15 attacks). It is also important to mention that the most frequent atypical criterion found was related to the area of joint involvement (Table 2). Cervical spine was the most affected area, and this finding is in agreement with other studies carried out in Brazil. Table 4 presents a comparison between the areas of joint involvement found in our study with those of other studies in Brazil and abroad.[7,13,14]

Atypical articular manifestations had already been described in 1959, when Crea & Mortimer[15] described scarlatinal arthritis with a latency period of less than 10 days, which is less than that of acute rheumatic fever. However, the development of cardiac sequelae occurred in 56% of cases, thus suggesting a type of rheumatic fever.

In 1975, Stollerman[5] observed that 32% of the children with acute rheumatic fever in his study population did not present the classical pattern of joint involvement considering increased duration of the attack, clinical status of monoarticular arthritis and/or unsatisfactory response to salicylates. Other descriptions of atypical articular status in

Table 4 - Comparison of joint involvement reported in other studies (%)

Joints	Feinstein, Spagnuolo (1962)[13]	Almedra et al. (1992)[14]	Hilário et al. (1995)[7]	Our study (1997)
Knee	76	73.3	76	75
Ankle	50	41.5	62	79
Elbow	15	18.8	29	19
Wrist	15	20.7	28	25
Hip	15	22.6	15	16
Small joints of the feet	15	17	13	32
Small joints of the hands	08	17	15	26
Shoulder	08	–	12	19
Cervical spine	01	–	15	26
Lumbar cord	–	–	07	4

rheumatic fever have been published, including in studies carried out in Brazil.[7,16]

However, the greatest confusion in the differential diagnosis of acute rheumatic fever follows the description of post-streptococcal reactive arthritis (PSRA), mentioned for the first time in the literature in 1982 by Goldsmith & Long.[17] These authors called the attention to the longer duration of arthritis cases occurring immediately after or concomitantly with streptococcal infection, as well as to its symmetric pattern. At the time, the authors suggested that this could be the result of an altered response to some antigenic modification of the group A beta-hemolytic streptococcus. Since then, several authors have presented reports on this type of disorder, which differs from acute rheumatic fever (also reactive and post-streptococcal) in that it presents a shorter latency period after streptococcal infection, a longer duration of articular manifestations, and a poor response to salicylates.[18-21]

It is important to note that the inclusion of polyarthritis as one of the major criteria has been discussed in the past. Davis[22] suggested that post-streptococcal reactive arthritis, in the absence of carditis and/or chorea, should not be considered as evidence of acute rheumatic fever. However, several studies[23-25] have already shown that a significant number of patients with polyarthritis and evidence of previous streptococcal infection presented carditis in subsequent attacks or even in the same attack weeks after the articular manifestation. Consequently, this indicates the importance of arthritis in Jones major criteria, especially as to what concerns diagnosis.

Since the majority of the described cases of PSRA present at least two of Jones minor criteria in association with arthritis and in addition to evidence of recent streptococcal infection, the elimination of diagnosis of acute rheumatic fever can be uncertain, especially considering that some patients develop carditis later on. Should we question the diagnosis of acute rheumatic fever in cases in which joint involvement was considered atypical and change the diagnosis to post-streptococcal reactive arthritis? This question has been frequently posited over the last years. In a recent editorial, Gibofsky et al.[26] comment on this problem raising the question of whether we would not be making the mistake of attributing two names for the same disease and of why describe a new disease (post-streptococcal reactive arthritis) whose diagnosis is based on criteria similar to those already indicated for the diagnosis of another disease (acute rheumatic fever)?

In conclusion, our study shows that atypical articular manifestations were present in a significant percentage of cases of acute rheumatic fever. This may represent an additional difficulty for establishing a diagnosis. In this sense, we would like to call the attention of pediatricians attending to children with complaints of joint problems. It is important not to disregard the diagnosis of acute rheumatic fever, even if the initial arthritis does not present all the characteristics of classical arthritis. There is the possibility that doctors may be dealing with a disease that can result in cardiac sequelae and that is very important in Brazil. In this sense, the disregard for the diagnosis of acute rheumatic fever may result in poorer quality of life of young people, with significant losses for the individual and for the State.

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