

Letter to the Editor

Clinical and microbiological features of septic arthritis in children: Experience of one Latin American country

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Dear Editor,

Joint infections can be caused by bacteria, fungi or viruses. Among these three types, bacterial infections are considered the most serious problem as they occur more frequently. Bacteria are responsible for septic arthritis in 50% of children under the age of 20 [1]. Rapid recognition is necessary to initiate the appropriate treatment in a timely manner. Empiric antibiotic treatment is based on the patient's age and most likely organism involved in a given community [2].

Based on the above-mentioned facts, the objective of the study was to describe the clinical characteristics and microbiological findings of septic arthritis in children admitted to the Institute of Tropical Medicine, the main referral center for infectious diseases of Paraguay.

Material and methods

A cross-sectional, observational, descriptive, non-probabilistic study was performed based on data from pediatric patients younger than 16 years of age, who were admitted to the institution with a diagnosis of septic arthritis from 2009 through to 2013. We included patients with arthritis as the only diagnosis as well as those with adjacent osteomyelitis. An electronic template was developed on Microsoft Excel where the data, extracted from the medical records, were recorded. Demographic data, laboratory and imaging results as well as the outcome were analysed. For the statistical analysis, the data was analysed using measures of central tendency, dispersion and proportions. All analyses were performed with the

statistical software R (version 2.15.0). The study protocol was approved by the appropriate Ethics Committee of the institution before implementation of the study.

Results

Thirty-three children were identified in this study. Relevant demographic, clinical and laboratory characteristics of the study population are shown in Table 1. Briefly, the mean age (\pm standard deviation) of the children was 7 ± 4 years (interquartile range [IQR] 4-10) and the sex ratio (M:F) was 1.75:1. Fever was present in all cases, and the mean number of days with fever prior to hospitalisation was 7 (range 1 to 17 days). Relevant symptoms present at the time of admission were pain, joint swelling and skin rash, which were present in 95%, 15% and 12 % of the cases, respectively. A history of trauma was reported in 45% of all cases. In 18 patients (54.5%) arthritis was the only diagnosis; however, in 15 patients (45.6%) joint inflammation was accompanied by infection of the contiguous bone. The hip and the knee were the most frequently affected joints in 45,4% and 39,3% of the cases, respectively. Ultrasound examinations of the affected joint were performed in 20 patients (61%), and synovial membrane thickness and/or joint effusion was found in 19 patients. In relation to laboratory parameters, 16 patients (48.5%) presented with leukocytosis (which was defined as a leukocyte count greater than $11,000/\text{mm}^3$) and 27 patients (82%) exhibited increases in C-reactive protein levels at the time of hospital admission.

In 21 patients (64%) joint fluid culture was positive for bacterial infection, and the same organism was isolated in the blood culture in 12 cases. In two cases, the infecting microorganism only grew in the blood. *Staphylococcus aureus* was the bacterial agent more frequently isolated and was found in 22 of the 23 positive cases (96%), with 23% of these being resistant to methicillin. *Streptococcus pyogenes* was isolated in the other case.

Eight patients underwent open surgical drainage (all cases of hip arthritis) immediately after diagnostic confirmation. Twenty-one patients (64%) underwent a single joint aspiration procedure and 6 patients (18%) underwent more than one joint fluid surgical drainage. The duration of the hospitalisation was 9 ± 10 days.

Discussion and conclusions

Septic arthritis continues to be an entity with worrying figures on morbidity and mortality, with scarce information from Latin-American countries [3,4]. The high concurrency of osteomyelitis observed in this series is not surprising [5]. Several studies have shown a low bacterial recovery rate around 33-37% [1,2,6], which are much lower than that found in our study where the cultures resulted in a high return rate

(70%). *S. aureus* was the most frequent bacterial agent isolated in our series. We found a relatively high incidence of septic arthritis caused by methicillin-resistant *S. aureus*. This susceptibility pattern concurs with data from other recent series of septic arthritis [7]. Although other pathogens are being identified with increasing frequency, such as *Kingella kingae* [8], there was no cases with this microorganism in this study. It is probable that with the use of polymerase chain reaction techniques for analysis of joint and bone aspirates this microorganism could be identified.

Rapid recognition of changes in the epidemiology of arthritis can provide more appropriate empirical treatment, which targets the most probable pathogen to reduce the incidence of serious complications. To conclude, it is valuable to conduct epidemiological studies at the institutional level to approach the characteristics of septic arthritis to establish parameters of similarity or difference between countries with transitional economy such as Paraguay and first world countries.

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Table 1. Clinical features of septic arthritis in children admitted to the Institute of Tropical Medicine of Paraguay, 2009 to 2013.

Clinical characteristics	Total n = 33 (100%)		Arthritis n = 18 (54.5%)		Concurrent arthritis and osteomyelitis n = 15 (45.6%)	
	n	(%)	n	(%)	n	(%)
Days of fever prior to hospitalization (range)	7.0 (1-17)		6.0 (1-12)		8.8 (3-17)	
Signs and symptoms						
History of trauma	14	42.4	9	50.0	5	33.3
Pain	31	93.9	17	94.4	14	94.0
Functional impotence	30	90.9	16	88.8	14	93.3
Joint swelling	5	15.1	3	16.6	2	13.3
Gastrointestinal symptoms	7	21.2	5	27.7	2	13.3
Rash	4	12.1	1	5.5	3	20.0
Appearance toxic	4	12.1	0	0.0	4	26.6
Localization						
Hip	15	45.4	8	44.4	7	46.6
Knee	13	39.3	9	50.0	4	26.6
Elbow	5	15.1	1	5.5	4	26.7
More than one joint	3 *	9.0	2	11.1	1	6.6
Microbiology						
Blood culture positive	14	42.4	3	16.7	11	73.3
Joint fluid culture positive	21	63.6	11	61.1	10	66.6
Microorganism isolated	23	69.6	10	55.6	13	86.6
Methicillin-resistant <i>S. aureus</i>	5	15.1	1	5.5	4	26.6
Methicillin-sensitive <i>S. aureus</i>	17	51.5	8	44.4	9	60.0
<i>S. pyogenes</i>	1	3.0	1	5.5	0	0.0
Evolution						
Length of hospital stay, days, mean \pm SD *	17 \pm 14		13.0 \pm 11.3		22.8 \pm 16.9	

* This number includes two patients with simultaneous hip and knee involvement and one patient with concurrent hip arthritis and femoral osteomyelitis; therefore, the sum is more than 33 patients; SD, standard deviation.

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