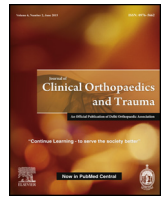




Contents lists available at ScienceDirect

Journal of Clinical Orthopaedics and Trauma

journal homepage: www.elsevier.com/locate/jcot



Original Article

Current trends of microorganisms and their sensitivity pattern in paediatric septic arthritis: A prospective study from tertiary care level hospital

Girish Motwani*, Rujuta Mehta, Alaric Aroojis, Sandeep Vaidya

Department of Paediatric Orthopaedics, B.J. Wadia Hospital for Childrens, Mumbai, India

ARTICLE INFO

Article history:

Received 7 July 2016
Received in revised form 22 August 2016
Accepted 16 September 2016
Available online xxx

Keywords:

Septic arthritis
BACTEC
Staphylococcus
Aureus
Cephalosporine

ABSTRACT

Purpose: Early treatment of septic arthritis is essential before irreversible damage to the articular cartilage occurs. Clinicians often start empirical antibiotic therapy for symptomatic relief while awaiting a definitive culture report. In present day parlance with variations in different centres in the private and public sector and rampant antibiotic abuse, a lot of resistance is being seen in the flora and their sensitivity patterns. Hence it is imperative to document and analyze these changing trends.

Methods: The authors conducted a retrospective analysis of prospectively gathered data of 60 patients under 14 years of age. Joint arthrotomy was performed as a standard therapeutic protocol and the drained pus or synovial fluid was sent for gram stain and culture by 2 different methods: conventional agar plate method and BACTEC Peds Plus/F bottle method. Antibiotic susceptibility tests were done by the disc diffusion method of Clinical Laboratory Standards Institute (CLSI).

Results: The commonest presenting age group was below 1 year (80% patients) including 24 neonates. There were 19 hospital and 41 community acquired cases of septic arthritis. The hip (56%) was the commonest affected joint followed by knee (28%), shoulder joint (11%) and elbow (5%). Microorganism was isolated in 53% isolates of joint fluid only (36 culture positive patients). Conventional agar methods of culture showed positive report in only 42% patients (15/36 patients) while with the BACTEC method the yield was 71%. In the Community acquired septic arthritis, methicillin sensitive *Staphylococcus aureus* was isolated as commonest microbe while resistant variety of gram negative bacilli including *E. coli* and *Klebsiella* were found as predominant organism causing hospital acquired nosocomial infection of joints. The results strikingly differ in terms of response to treatment as most patients (11/19 patients) showed significant resistance to the most commonly practiced empirical antibiotic regimen of ampicillin-cloxacillin group in routine practice. When cefazolin was used as empirical antibiotic, it has shown good response and better sensitivity in 82% patients (27/33 patients).

Conclusion: *S. aureus* is still the most common organism in septic arthritis. The BACTEC system was found to improve the yield of clinically significant isolates. Though a significant resistance to common antibiotic regimen is noticed, the strain is susceptible to cephalosporin group of antibiotics. We recommend the use of cephalosporine antibiotics as an empirical therapy till culture and sensitivity report are available.

© 2016

1. Introduction

Septic arthritis remains an important and serious disease of childhood because of its potential to cause permanent sequelae. Delay in its diagnosis and treatment of septic arthritis in paediatric

patients can lead to disastrous complications like destruction of articular cartilage, physal damage, and dislocation of joints.^{2,4}

Despite significant advances in modern medicine with availability of better antibiotics, septic arthritis is still a major cause of morbidity. The cause is multifactorial as there is a shift in the microbiological spectra and epidemiology with emerging antibiotic resistance. This also has a distinct geographical variation. Native joint septic arthritis is usually secondary to hematogenous seeding of joint during transient or persistent bacteraemia. Early treatment is essential before damage to the articular cartilage

* Corresponding author.

E-mail addresses: gitz.dr@gmail.com (G. Motwani), rujutabos@gmail.com (R. Mehta), aaroojis@gmail.com (A. Aroojis), drsvvaidya@gmail.com (S. Vaidya).

occurs. This mandates empirical antibiotic therapy without awaiting culture report. Although it is a disease being studied since 18th century, with the advent of more and more modern antibiotics a lot of resistance is being seen in the flora and their sensitivity. Despite the disease being rampant in India there is a paucity in literature on the subject about the Indian regional clinical scenario. Hence it is imperative to document and analyze these changing trends repeatedly.

1.1. AIMS of the our study

1. To evaluate the causative organisms for septic arthritis of children from neonates to 14 years.
2. To study the comparison of BACTEC blood culture system (Becton Dickinson Diagnostic Instrument Systems, Sparks, MD) with conventional agar culture methods for recovery of bacterial isolates from synovial fluid sample.
3. To evaluate the response to common empirical antibiotics of ampicillin-cloxacillin group versus our institutional practice of cephalosporins.

2. Materials and methods

The authors conducted a retrospective analysis of prospectively gathered data of paediatric patients under 14 years of age with diagnosis of septic arthritis (SA), treated at our institute from June 2013 to March 2016. The institute gets referrals from private clinics, NICU's and PHC's and district as well as municipal hospitals of almost whole of Maharashtra and neighbouring states of the western Indian region. Total 77 patients of septic arthritis were diagnosed and operated in 3 years from June 2013 to March 2016. Out of them, 17 patients are lost in follow-up. We have reviewed complete data of sixty children of either sex, with septic arthritis of any joint. This three-year prospective study evaluates the microorganisms and their sensitivity pattern.

Inclusion criteria: Children in the age group of 1 day–14 years presenting with

- 1) joint pain,
- 2) fever,
- 3) restriction of movements,
- 4) and elevated cell counts,
- 5) raised CRP and ESR values.

Additionally confirmation of diagnosis was done by (a) at least one of the following radiological or sonographic findings: increased joint space and bony changes or fluid collection on ultrasound scan with (b) purulent fluid aspiration from the joint. Informed consent was obtained from parents of all individual participants included in the study.

In management, arthrotomy done under sterile precautions in operation theatre We found that synovial fluid isolates of the patients collected after arthrotomy were cultured by 2 methods as per standard guidelines of microbiology department of B.J. Wadia hospital.

GROUP 1

Synovial sample of 36 patients were processed in conventional agar plate method which includes inoculation of synovial fluids directly onto 5% sheep blood agar and chocolate agar, which were incubated at 35 °C with 5–7% CO₂ for 2 days. In addition, approximately 0.25 ml was inoculated into thioglycolate broth, which was incubated at 35 °C with 5–7% CO₂ for 5 days.

GROUP 2

Synovial fluid isolates of 24 patients were inoculated into a BACTEC Peds Plus/F bottle and incubated for 5 days.

Sensitivity was tested against the following antimicrobial drugs: cloxacillin, amoxicillin, ceftriaxone, linezolid, and vancomycin. Antibiotic susceptibility tests were done by disc diffusion method of Clinical Laboratory Standards Institute (CLSI).

We found that empirical antibiotic therapy in the form of intravenous ampicillin-cloxacillin was given to 19 patients and cefazoline was started in 33 patients, as per the protocol of our department.

The children were treated with arthrotomy and antibiotic therapy depending on their severity and time of presentation. Definite antibiotic treatment for a period of 2–3 weeks was given as per the culture report. The children were followed up with clinical and haematological investigations every week for a period of 12 weeks.

Demographic data, clinical symptoms, laboratory findings, bacterial spectrum, method of culture, diagnostic significance of radiological tests, antibiotic sensitivity pattern and outcomes were systematically analyzed.

3. Results

Demography: The commonest age group in the presentation was children below 1 year (80% patients), including most of neonates (40%) (Table 1).

Type of infection: There were 19 hospital acquired infection and 41 community acquired cases of septic arthritis.

Sex: Male children outnumbered the female children in the ratio of 2.3:1.

Presentation: 68% of children presented within a week, 24% presented in the second week, and 8% presented after two weeks.

Affected joints: Lower extremities were involved in most of the cases (56% hip, 28% knee). In the upper extremities, the involvement of shoulder and elbow joint was 11% and 5%, respectively (Table 2).

X-ray: Only 42% patients showed positive findings like increased joint space, haziness, and soft tissue changes. All these cases presented with more than one week of symptoms.

USG: Ultrasonography showed evidence of fluid collection and synovial thickening in all cases (98%) except one where the findings were equivocal.

3.1. Culture

In 47% ($n = 28$) patients, organism was not detected in culture examination (culture negative).

Out of 53% positive culture ($n = 32$), methicillin sensitive *Staphylococcus aureus* (MSSA) was isolated in 50% synovial isolates, 16% culture were positive for *E. coli* and *K. pneumoniae* was detected in 13% isolates. Rare organism found were salmonella, anaerobes and *Burkholderia cepacia*. About 10% were fungal (all candidial) septic arthritis.

Current trends of bacterial strain are showed in Table 3.

In community acquired septic arthritis, methicillin sensitive *Staphylococcus* was isolated as commonest agent while resistant variety of gram negative bacilli including *E. coli*, *Klebsiella* were

Table 1
Incidence according to age.

Age distribution	Number of patients
Neonates	24
1–3 months	10
3 months–1 year	13
1–3 years	7
>3 years	2

Download English Version:

<https://daneshyari.com/en/article/5653291>

Download Persian Version:

<https://daneshyari.com/article/5653291>

[Daneshyari.com](https://daneshyari.com)