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Risk factors for septic arthritis of hip in neonates and infants

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Abstract
Introduction: Suppurative arthritis of hip is pyogenic inflammation of synovial membrane of the hip, usually due to bacterial infection. The main aim of early diagnosis and treatment of septic arthritis of hip is to Prevent damage to articular cartilage and growth plate, give stable and painless hip, resume normal development and prevent sequelae.
Aim: To study Risk factors For Septic Arthritis of Hip in neonates and infants
Materials & Methods: A prospective interventional study consisted of 34 patients with 36 Hips septic arthritis of hip less than one year of age carried out at Department of Orthopedics of a tertiary care centre during Aug 2011 to Dec 2013. Risk factors and related laboratory investigations were carried out. Data entry and analysis was done by M.S. Excel 3.0.
Results: In our study more than 70% patients presented after one week. Left sided hip involvement (59%) was more common followed by right hip (35%). Sex ratio of the study population was M: F 4:6. NICU admission was present in 94% cases. In many of our patients there were more than one risk factors like septicemia, low birth weight, jaundice and ventilator support.
Conclusion: All NICU neonates should be handled with strict aseptic precaution.

Keywords: Septic arthritis, hip joint, children

Introduction

Septic arthritis (SA) results from the presence of microbial agents in a joint space. Septic arthritis is an orthopedic emergency; delay in diagnosis and treatment is the single most important factor affecting prognosis of septic arthritis in children. The involved joint must be decompressed as soon as diagnosis is suspected.

SA was a life threatening condition in the pre-antibiotic era; the bacteria gain access across the synovial membrane, and incite an inflammatory reaction, manifested by the presence of plasma proteins and polymorph nuclear cells in the joint, producing an effusion. If left untreated, proteolytic enzymes initiate articular destruction.

SA is a challenging clinical problem because signs and symptoms may be subtle and overlap with those found in other conditions, screening laboratory studies and synovial fluid cultures are relatively insensitive, and optimal management, including duration of antibiotics and surgical approach is not evidence based.

SA occurs among all age groups but is most common in infants, younger children, peaking in those younger than age 3 years. Timely diagnosis is the most important prognostic factor in septic arthritis (SA). Early institution of therapy helps to prevent degenerative arthritis. Delay in diagnosis leads to a poorer outcome mainly in infants.

Other poor prognostic factors include infection of the hip joint, which may lead to aseptic necrosis of the femoral head; infection with *S aureus*; and a prolonged passage of time before the synovial fluid is sterilized. Because of the availability of antibiotics, children rarely die from septic arthritis or its complications. Although chronic arthritis is uncommon, the short-term morbidity and costs, in terms of prolonged antibiotic therapy and hospitalizations, may be substantial [1].

Due to lack of awareness about this entity in primary care physicians, there is delay in diagnosis and treatment which in turn leads to complications like subluxation, dislocation or destruction of femoral articular cartilage and growth plate which are vividly described in literature [2-3].

As per children health point of view, it is necessary to study important direct or indirect determinants like risk factors, clinical presentation and laboratory investigations among arthritis of Hip among children.

Aim: To study Risk Factors For Septic Arthritis of Hip in neonates and infants

Material and Methods
Study Design: Prospective interventional study

Sample Size: With Convenient sampling method 34 patients with septic arthritis of hip under one year of age were selected at Department of Orthopedics of New Civil Hospital Surat during Aug 2011 to Dec 2013.

Study Population: Children 0 day to 1 year
Data Collection methods
The pretested, semi-structured questionnaire was used for data collection.

Data Management and Analysis
After the completion of data collection, data entry and analysis was done by Excel 3.0.

Results
In our study about 63% patients were less than 3 months of age and 75% patients were up to 3yrs of age. In our study more than 70% patients presented after one week. 2 patients presented after one month. We had total 34 children and neonates of that 24 (71%) presented after 1 week.

Table 1: Distribution of Sex, Side of arthritis, NICU admission and risk factors among study population.

Variables	No. (%)
Sex	n=34
Male	10 (29%)
Female	24 (71%)
Side	n=34
Right	12 (35%)
Left	20 (59%)
Bilateral	02 (06%)
NICU Admission	n=34
Yes	32 (94%)
No	02 (06%)
Risk Factor*	n=34
Septicemia	14 (41%)
Ventilator support	10 (29%)
Low Birth Weight	08 (24%)
Jaundice	04 (12%)
Other Focus	02 (06%)

*Multiple Risk Factors

In our study left sided hip involvement was more common followed by right hip. We had two patients with bilateral involvement.
In our study we had total 34 infants and neonates. Of that 32(94%) had NICU admission. One infant who presented at age of 7 months had no previous hospitalization. These suggest that NICU admission increases risk of septic arthritis.
In our study septicemia was commonest associated condition. In many of our patients there were more than one risk factors like septicemia, low birth weight, jaundice and ventilator support. Due to one neonate having more than one risks factor the number of patients is more than actual.

Table 2: Distribution of patients according to local trauma, previous antibiotics and suspension test.

	No. (%)
Local trauma among Older Children	n=8
Present	04 (50%)
Absent	04 (50%)
Previous Antibiotics	n=34
Given	30 (88%)
Not Given	04 (12%)
Suspension test	n=34
Positive	34 (100%)
Negative	00 (00%)

In this study 88% patients were treated previously with antibiotics. This was responsible for negative blood culture.
Suspension test was performed in all infants & neonates. It was positive in all the infants & neonates. This makes it very useful to diagnose septic arthritis of hip.

Table 3: Distribution of the study population according to blood investigations.

	< 1 Year	> 1 Year
Total count	n=24	n=10
Normal (<12000 per ml)	18 (75%)	04 (40%)
Elevated (>12000 per ml)	06 (25%)	06 (60%)
ESR	n=24	n=10
Normal	02 (8.3)	02 (20)
Elevated	022 (91.6)	08 (80)
C-Reactive Protein	n=20	n=10
Normal	05 (25)	Nil (0.0)
Elevated	15 (75)	010 (100.0)

In this study about 75% infants & neonates had normal leukocyte count (Ranging from 6800 – 12000 per ml). In older children 60% patients had elevated count (Ranging from 12,500 – 27,800 ml).
In our study average ESR was 45mm per hour with a range from 20 to 100mm per hour. About 91% patients were with high ESR.
In our study about 25 patients had high CRP level on admission irrespective of age. Normal CRP was seen in 5 patients they were very late presented cases.

Table 4: Distribution of the study population according to blood culture reports.

Organism	No. (%) n=14
S.Aureus	08 (57.1)
E.Coli	06 (42.9)

In our study we had sent blood culture of all patients in that seven were positive with most common growth of staphylococcus aureus. Our 57% patients had growth of aureus.

Discussion
The diagnosis of septic arthritis is usually difficult and tends to be delayed in young infants. It is particularly difficult in neonates because the early signs of hip infection are unclear [3, 4].
Choi evaluated residual deformity after treatment for septic arthritis in 31 children younger than 1 year of age, and concluded that premature birth as well as delay in diagnosis and start of treatment were associated with poor clinical outcome [3].
No case of septic shock was encountered in our series but we had 14 cases of bacteremia which were isolated by blood culture. In cases of septic arthritis of the hip, infection probably starts from the metaphysis and then spreads into the joint as well

as bone. It can thus cause osteomyelitis of the femur.

In our study 75% of the patients were less than 3 years of age which is similar to a study conducted by Griffin [5] which showed that 70% of their patients were less than 4 years of age. He also reported that infants and young children were more likely to have poor results because of delay in diagnosis. We had female predominance in our study which is contrary to study by Bennett and Namnyak where they found male predominance [6].

In our study left sided hip involvement was more common followed by right hip. We had two patients with bilateral involvement. It is contrary to study by Bennett; where he found that right hip (57%) involvement was predominant [6].

In our study average ESR was 45 mm per hour with a range from 20 to 100 mm per hour. About 91% patients were with high ESR. It was similar to study by Klein [7], where he found that 95% presented with ESR greater than 20 mm per hour. In our study about 25 patients had high CRP level on admission irrespective of age which was similar to study by Khachaturian's which they found 88% had an elevated CRP on admission [8].

In our study we had 57% of patients which showed growth of MRSA out of all the patients which tested positive in blood culture. This was similar to study by Lunseth [9] where he found 60% of the infection caused by S. aureus.

Conclusion

Septic sequelae were more common in neonates & infants with late presentation. So patients with risk factors like prematurity, low birth weight, septicemia, and NICU admission should be daily screened with strict aseptic precaution. So that early correct diagnosis and aggressive treatment helps in improving clinical outcome. Slight swelling, erythema, warm skin on the thigh, pseudo paralysis of the leg, and positioning in slight flexion and external rotation are possible early signs of hip infection. It is of utmost importance that the treating pediatrician should be familiar with these sign and symptoms of septic arthritis and whenever encountered in clinical practice should urgently refer such patients to an orthopedic specialist. Aggressive approach must be undertaken by the orthopaedician and should start with puncture and drainage, identification of organisms, and corresponding antibiotic administration. Initial use of antibiotics effective against MRSA should be considered without waiting for culture reports in NICU or in the neonatal nursery where surveillance showed MRSA positive [10].

We were not able to specify precise values of laboratory investigations that would indicate urgent arthrotomy because the protocol suggested that it should be performed only when response to medical management was not satisfactory.

Authors' contribution: C.N conceived the idea, collected data, analyzed and prepared the initial draft of the paper. P.N supervised the data collection and provided support, encouragement and administrative help to carry out this study. M.H and C.V helped in analysis and drafting the manuscript.

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References

1. Medscape. Factsheet: pediatric septic arthritis. Available at: http://emedicine.medscape.com/article/970365-overview#a6 Assessed on 9th June 2016.
2. Hunka L. Classification and surgical management of the severe sequelae of septic hip in children. CORR. 1982; 171:30-36.
3. In HO Choi, Peter Pizzutillo D. Sequelae and Reconstruction after septic arthritis of the hip in infants JBJS-VOL-72-A, 1990.
4. Obletz BE. Acute suppurative arthritis of the hip in the neonatal period. J Bone and Joint Surg Am. 1960; 42:23-30.
5. Griffin PP, Green WT Sr. Hip joint infections in infants and children. Orthop Clin North Am. 1978; 9:123-134.
6. Oliver Moses Bennett, Simon Sandett Namnyak. Acute septic arthritis of hip joint in infancy and childhood. Corr. 1992; 281:123-132.
7. David Klein M, Cart Barbera. Sensitivity of objective parameters in the diagnosis of pediatric septic hips Corr. 1997; 338:153-159.
8. Armond Khachatourians G, Michael Patzakis J. Laboratory monitoring in pediatrics acute osteomyelitis and septic arthritis. CORR. 2003; 409:186-194.
9. Paul A, Lunseth MD, Kingsbury G, Heiple MD. Prognosis in septic arthritis of hip in children. CORR. 1979; 139:81-85.
10. Comparison of clinical outcome after treatment of hip arthritis caused by MRSA with that caused by non-MRSA in infants. Mitsuaki Mortia, Hiroaki Nakamura and Toshio Kitano. Journal of Pediatric Orthopaedics B. 2009; 18:1-5.