

The Frequency of Multifocal Disease and Pyogenic Hip Arthritis in Neonates with Osteomyelitis

Jiwoong Shin, MD^{1,3}, Oded Scheurman, MD², Itzhak Levy, MD², and Lorry G Rubin, MD^{1,3}

¹Steven and Alexandra Cohen Children's Medical Center, New Hyde Park, NY

²Schneider Children's Medical Center of Israel, Petach Tikva, Israel

³Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY

Address: 269-01 76th Ave.
Queens, NY 11040
E-mail: jshin4@northwell.edu



Abstract

Background: There has been limited literature on osteo-articular infections in neonates written in the past twenty years. In fact, no case series have been reported in the current era of high prevalence of community-associated methicillin-resistant strains of *Staphylococcus aureus*. Previous studies have shown that neonates are more prone to multi-focal disease with infection. This study looked to provide a review of recent cases of neonatal osteomyelitis cases to provide contemporary data on the epidemiology, microbiology, prevalence of multi-bone and contiguous joint involvement, and proportion of cases with pyogenic arthritis of the hip.

Methods: Multi-center retrospective chart review. Neonatal osteomyelitis and septic arthritis cases were identified through the medical record and NICU registries at Cohen Children's Medical Center, St. Christopher's Hospital for Children and Schneider Children's Medical Center of Israel between 1993 to 2018. The diagnosis of septic arthritis/osteomyelitis was made through clinical symptoms along with radiological findings or positive blood or joint fluid cultures.

Results: Thirty cases were seen across 3 sites between 1993 and 2017. The median gestational age was 27.8 (range 23 to 39) weeks and mean birth weight was 1,363 (range 603 – 3,195) grams with slightly male predominance (60% to 40%). Local redness (66%) and local swelling (60%) were the most common presentations, while apnea (53%) was the most common systemic symptom. The median age at time of diagnosis was 33.5 (range 11 to 175) days of life.

In the 26 babies who had plain radiographs performed, radiologic changes were seen in 22 babies (84%) during their hospital course. 21 (70%) had exclusive bone involvement while 8 (26%) underwent both bone and joint involvement. The femur was the most commonly first identified bone involved (12) while the knee was the first identified joint in 6 cases. 8 babies (26%) had multiple non-contiguous infections. The hip joint was involved in 5 babies (16%). Of these, two cases occurred greater than 48 hours after initial presentation. A hip ultrasound was performed on 40% of babies (12/30). Of these, 4 cases demonstrated simple effusion which required surgical interventions. Subsequent hip cultures all grew MSSA.

A positive blood culture was seen in 23 babies, while there were 6 positive joint cultures and 2 positive bone cultures. Among these cultures MSSA (76%) was the most common pathogen followed by MRSA (20%). 10 (33%) babies underwent surgical interventions, while the remainder were medically managed. The most common antibiotic choice was oxacillin/nafcillin (60%), with the median length of antibiotics of 32 (range 7 to 51) days.

Hip and knee joint destruction was seen in 2 babies (8%) in long term follow-up with limp and limb length discrepancy seen in these children respectively.

Conclusions:

Neonates in a NICU with osteo-articular infection should be suspected of having multiple sites of involvement. The hip joint is infected in a relatively high proportion of babies; in view of the importance of early surgical drainage of pyogenic hip arthritis, an ultrasound of the hips may be routinely recommended in neonates with a diagnosis of osteo-articular infection at any body site.

Background

Osteomyelitis and septic arthritis are uncommon but serious infections in neonates in intensive care units. There is limited literature on neonatal osteoarticular infections during the past 20 years, a period during which there was an emergence of methicillin-resistant *Staphylococcus aureus* (MRSA) infection.

Objectives

To describe a case series of neonatal osteoarticular infections ---
-emphasis on microbiology, prevalence of multi-bone & joint involvement, & proportion of cases with hip pyogenic arthritis.

Hypothesis

In neonatal bone/joint infection, both multi-focal disease and pyogenic arthritis of the hip is common.

Results

- N = 30
- Demographics
 - Gestational Age
 - Median: 28 weeks; range: 23.5-39.3 weeks
 - 80% were premature
 - Median age at diagnosis: 33.5 d; range: 11-175 d
- Clinical Findings
 - Localized findings
 - Erythema (66%), Swelling (60%)
 - Systemic findings
 - Most common systemic finding: apnea (53%)
 - Bone and joint involvement
 - Osteomyelitis only: 21 cases (70%)
 - Pyogenic Arthritis: 1 case (3%)
 - Both osteomyelitis + pyogenic arthritis: 8 cases (27%)
 - Multiple sites occurred in 28% (Figure 1)
 - Femur was the most commonly involved bone (Figure 3)
- Hip Arthritis
 - Observed in 5 of 30 cases (16.6%)
 - Presentation of infection in 3 babies
 - Diagnosed > 48 hours after initial presentation in 2
 - Ultrasound of the hip performed on 12 babies (40%)

Figure 1

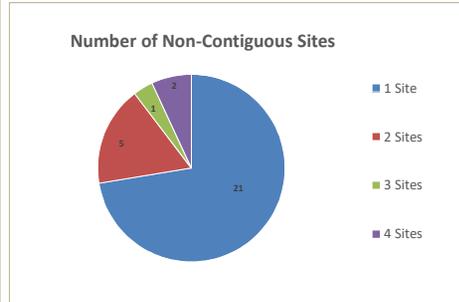


Figure 2

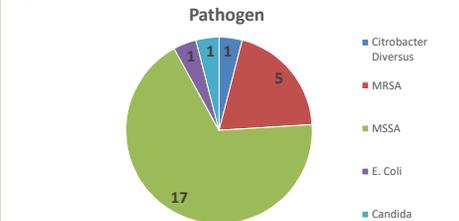
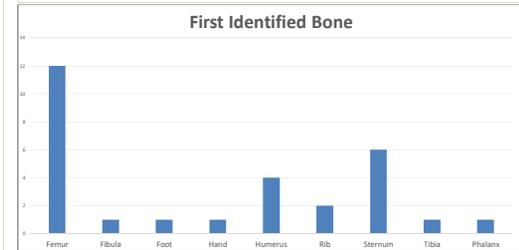


Figure 3



Conclusions

- Osteoarticular infections in neonates in a NICU frequently occur in multiple sites.
- MSSA remains the most common pathogen.
- Hip joint is infected in a sizeable number of babies.
- Hip ultrasound should be considered in neonates in a NICU with osteoarticular infection at any body site.

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