196. Clinical Characteristics and Outcomes of Healthcare-Associated Hematogenous Vertebral Osteomyelitis

Kim Ho Park, MD; YU-Mi Lee, MD; SONG Mi Moon, M.D., PhD; SEO Yeon Park, MD; OB-Hyun Cho, MD; MI Suk Lee, MD; IN-Gyu Bae, MD; 2Department of Internal Medicine, Kyung Hee University Hospital, Seoul, Korea, Republic of (South); 3Infectious Disease, Daegu Armed Forces Capital Hospital, Seongnam, Korea, Republic of (South); 4Internal Medicine, Dongguk University Ibsan Hospital, Goyang, Korea, Republic of (South); 5Department of Internal Medicine, Gyeongsang National University Changwon Hospital, Changwon, Korea, Republic of (South); 6Department of Internal Medicine, Gyeongsang National University Hospital, Jinju, Korea, Republic of (South)

Session: 45. Clinical: Bone and Joint Infection

Thursday, October 5, 2017, 7:30 AM

Background. The incidence of hematogenous vertebral osteomyelitis (HVO) has increased over recent years, likely due to longer life expectancies, higher prevalence of chronic disease, and more effective diagnostic techniques. Recently, healthcare-associated infections, such as healthcare-related and procedure-related bloodstream infections, also increase the risk of HVO. The aim of our study was to evaluate the clinical characteristics and outcomes of healthcare-associated HVO (HCAHVO).

Methods. We conducted a retrospective chart review of adult patients with microbiologically diagnosed HVO from five tertiary-care hospitals over 8-year period. HCAHVO was defined as onset of symptoms after 1 month of hospitalization or within 6 months after hospital discharge, or ambulatory manipulations in the 6 months before the diagnosis [Pigra et al. Medicine (Baltimore) 2015; 94:e365]. We compared the clinical characteristics and outcomes of HCAHVO with community-acquired HVO (CAHVO) cases.

Results. In total, 358 patients with microbiologically diagnosed HVO were included in final analysis. Of these 358 cases, 256 (63.1%) were CAHVO and 132 (36.9%) were HCAHVO according to the predefined criteria. The main causative pathogens identified in HCAHVO included methicillin-resistant S. aureus (MRSA) (26%), aerobic gram-negative bacteria (24%), and Streptococcus species (11%). Compared with CAHVO cases, patients with HCAHVO had more neoplasm (13.6% vs. 5.8%, P = 0.01) and end-stage renal disease (8.3% vs. 2.2%, P = 0.007). MRSA was more frequent pathogens in HCAHVO two cases than in CAHVO (37.1% vs. 17.7%, P = 0.01). Patients with HCAHVO were more likely to have the higher rates of persistent bacteremia for >7 days (24.2% vs. 15.5%, P = 0.04), 1-year mortality (18.2% vs. 11.5%, P = 0.08) and 1-year relapse (12.1% vs. 7.6%, P = 0.051).

Conclusion. In this study, more than one-third of HVO is health care associated. Patients with HCAHVO were more likely to have underlying illness, and their causative pathogens were more frequently MRSA. Outcomes of HCAHVO were poorer, which require prevention measures and early diagnosis.

Disclosures. All authors: No reported disclosures.

197. The Spectrum of Pediatric Osteoarticular Infections: A Comparative Study

Zaid Alhinai; Morvarid Elahi, MD; Bill Foo, MD; Brian Lee, MD; Kimberle C. Chapin, MD; Penelope H. Dennehy, MD, FIDSA, FPIDS; Michael Koster, MD; Pablo J. Sanchez, MD, FIDSA, FPIDS; and Ian C. Michelow, MD, DTM&H*; 1Pediatric Infectious Diseases, Hasbro Children’s Hospital, Brown University, Providence, RI; 2Nationalwide Children’s Hospital, Columbus, Ohio, “Hasbro Children’s Hospital, Brown University, Providence, Rhode Island, “Pathology and Laboratory Medicine, Rhode Island Hospital, Providence, Rhode Island, “Pediatrics, The Alpert Medical School of Brown University, Providence, Rhode Island, “Pediatrics, Hasbro Children’s Hospital, Brown University, Providence, Rhode Island, “Pediatrics, Division of Pediatric Infectious Diseases and Neonatology, Nationwide Children’s Hospital – Ohio State University College of Medicine, Columbus, Ohio, “Center for International Health Research, Rhode Island Hospital, Medical School of Brown University, Providence, Rhode Island

Session: 45. Clinical: Bone and Joint Infection

Thursday, October 5, 2017, 7:30 AM

Background. The spectrum of pediatric osteoarticular infections is not well characterized. This study compared the clinical characteristics and outcomes of pediatric bone infections with osteomyelitis (AHO), staphylococcal arthritis (SA), staphylococcal cellulitis (SCHO), non-hematogenous osteoarticular infections (NHO), and hematogenous osteoarticular infections (HIO). We focused on non-vertebral sites to evaluate clinician-initiated changes to empiric antimicrobial therapy after obtaining bone biopsy results. A secondary aim was to identify predictors of a positive bone culture.

Methods. We retrospectively reviewed all cases of non-vertebral OM in patients under 18 years of age between 2009 and 2014. Data on pathologic and microbiologic yield were collected and logistic regression was used to determine potential factors affecting the microbiologic yield. Post-biopsy empiric antibiotics and final antibiotics were compared to determine if there was a change in antibiotic treatment after biopsy results were reported.

Results. We evaluated 203 bone biopsies in 185 patients. Samples from 115 (57%) cases were sent to pathology, of which 33 (29%) confirmed OM. All samples were sent to microbiology and 57 (28%) yielded a positive result. Diabetes (OR=3.9, P = 0.021) and white blood cell count (OR=1.3, P = 0.006) were significantly associated with positive bone cultures in multivariate analyses. There was no association between positive cultures and number of samples cultured, needle size, prior antibiotic use, or antibiotic days. Post-biopsy empiric antibiotics were given in 126 (62.5%) cases. Therapy was narrowed to target specific pathogens in 71 (56%) cases. Changes due to inadequate empiric treatment in three cases. Targeted therapy was initiated in 4/65 cases, in which empiric antibiotics had been initially withheld. While final antibiotics were withheld in 38/146 with negative bone cultures, empiric antibiotics were discontinued in only eight cases.

Conclusion. In patients with non-vertebral OM, bone biopsy cultures rarely yielded results that necessitated changes in antibiotic management. Idiopathic bone infections were treated by empiric therapy in most patients. While bone biopsy results are the gold standard for OM, further work is needed to identify patients whose management may be impacted by this procedure.

Disclosures. All authors: No reported disclosures.

198. Utility of Diagnostic Bone Biopsies in the Management of Osteomyelitis Through Retrospective Analysis: How Golden Is This Gold Standard?

Cole Hirschfeld, BS; Shashi Kapada, MD; Joanna Bryant, MPH; Deanna Jannat-Khal, MS; Benjamin May, MD; Tamir Friedman, MD; Ole Vliegerveld, MD; Ernie Esquivel, MD; Weill Cornell Medical College, New York, New York, Department of Medicine, Weill Cornell Medical College, New York, New York, Department of General Internal Medicine, Weill Cornell Medical College, New York, New York, Department of Radiology, Weill Cornell Medical College, New York, New York, Division of Infectious Diseases, Weill Cornell Medical College, New York, New York

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Background. Bone biopsy is considered the gold standard for diagnosis and treatment of osteomyelitis (OM), but few studies have investigated the extent to which it influences antimicrobial therapy in non-vertebral bones. The purpose of this study was to evaluate clinician-initiated changes to empiric antimicrobial therapy after obtaining bone biopsy results. A secondary aim was to identify predictors of a positive bone culture.

Methods. We retrospectively reviewed all cases of non-vertebral OM in patients under 18 years of age between 2009 and 2014. Data on pathologic and microbiologic yield were collected and logistic regression was used to determine potential factors affecting the microbiologic yield. Post-biopsy empiric antibiotics and final antibiotics were compared to determine if there was a change in antibiotic treatment after biopsy results were reported.

Results. We evaluated 203 bone biopsies in 185 patients. Samples from 115 (57%) cases were sent to pathology, of which 33 (29%) confirmed OM. All samples were sent to microbiology and 57 (28%) yielded a positive result. Diabetes (OR=3.9, P = 0.021) and white blood cell count (OR=1.3, P = 0.006) were significantly associated with positive bone cultures in multivariate analyses. There was no association between positive cultures and number of samples cultured, needle size, prior antibiotic use, or antibiotic days. Post-biopsy empiric antibiotics were given in 126 (62.5%) cases. Therapy was narrowed to target specific pathogens in 71 (56%) cases. Changes due to inadequate empiric treatment in three cases. Targeted therapy was initiated in 4/65 cases, in which empiric antibiotics had been initially withheld. While final antibiotics were withheld in 38/146 with negative bone cultures, empiric antibiotics were discontinued in only eight cases.

Conclusion. In patients with non-vertebral OM, bone biopsy cultures rarely yielded results that necessitated changes in antibiotic management. Idiopathic bone infections were treated by empiric therapy in most patients. While bone biopsy results are the gold standard for OM, further work is needed to identify patients whose management may be impacted by this procedure.

Disclosures. All authors: No reported disclosures.

199. Comparative Analysis of Initial Antibiotic Dosing Among Healthy Weight, Overweight, and Obese Children with Osteomyelitis

Joel Waddell, DO; Russell Mcculloh, MD; Jennifer Godman, MD, MS; Brian Lee, MPH; and Warren Teachout, BS; Children’s Mercy Hospitals and Clinics, Kansas City, Missouri

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Background. Acute hematogenous osteomyelitis (AHO) is a common infection of childhood. Inadequately treated AHO can lead to significant morbidity. Small studies have demonstrated alterations in the pharmacokinetics of antibiotics among obese children. Consequently, there is no consensus regarding appropriate dosing of antibiotics among obese children, and the role of weight in AHO dosing in overweight and obese children.

Methods. This is a single center, retrospective, cohort study of children 2–17 years of age with a discharge diagnosis of acute osteomyelitis admitted between 1/1/2012 and 12/31/2015. Complicated osteomyelitis cases were excluded. Variability of the initial mg/kg antibiotic dose was determined and compared between healthy weight, overweight, and obese children.

Results. 412 children were included in the cohort. In total, 83 (58%) were classified as healthy weight, 25 (18%) overweight, and 34 (24%) obese. No difference was found in the variability of mg/kg dosing of vancomycin or cefazolin across the three weight groups. Cefazolin dosing in healthy weight children (median 33.3mg/kg [IQR 32.9–36.7mg/kg]) was significantly higher as compared with obese children (24.4mg/kg [20.0–33.3mg/kg] (P=0.041). Cefepine dosing in healthy weight children (33.0mg/kg [20.0–29.9mg/kg]) was also significantly higher than in obese children (23.0mg/kg [20.0–29.9mg/kg] (P=0.013).

Conclusion. There was significant variability and lower overall dosing of first-generation cephalosporins among obese children compared with healthy weight children. Given the increasing incidence of invasive methicillin-susceptible Staphylococcus aureus infections, this study highlights the need for practitioners to...
optimize first-generation cephalosporin dosing in obese children suffering from AHO. These data also call for future studies to determine the clinical outcomes in obese children with AHO in relation to dosing adequacy.

Disclosures. All authors: No reported disclosures.

200. Septic Arthritis of Native Joints: Are Outcomes Better with Medical or Surgical Management?

Ian McConnell, MD; Adam Baghban, MD; Jurgen Holleck, MD and Munish Gupta, MD; Brigham and Women's Hospital, Boston, Massachusetts, 4Yale School of Medicine, New Haven, Connecticut, 5West Haven VA Hospital, West Haven, Connecticut

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Background. There is limited evidence to support medical vs. surgical management of native joint septic arthritis (SA) with no established guidelines for care. Advantages of medical (antibiotics with or without serial needle aspiration) and surgical (arthroscopic or arthrotoym drainage) treatments are unknown.

Methods. We conducted a single-center retrospective review of veterans diagnosed with SA over 10 years at the West Haven VA Hospital. Demographic, clinical, laboratory, imaging, and outcome data were extracted. Cases meeting inclusion criteria (positive culture or synovial fluid WBC >50,000) were stratified by surgical vs. medical management. Evaluated outcomes included joint recovery, time to recovery, sterilization of synovial fluid, duration of antibiotics, length of stay, recurrence of SA, and mortality. Odds ratios were calculated by multivariate analyses for correlation of outcomes to risk factors and to management approach taken.

Results. Sixty-one cases of SA met inclusion criteria. Average age was 67, 95% of patients were men, 89% White, 11% Black, 43% diabetic, and 43% had preexisting joint disease. 69% (41/61) of cases were managed surgically. Average length of stay for surgical group was 20 days compared with 14 days for medical group (P = 0.28). Duration of antibiotics was longer in surgical group (60.3 days) than medical group (35.4 days). P = 0.09).

S. aureus was the most common pathogen isolated (56%), followed by Streptococcus (11%) and gram-negative organisms (8%). Six (10%) patients had culture-negative SA. Mortality rate at 1 year was 32%. Full recovery of joint function at 1 year was achieved equally in both groups (P = 1.00), by 15/20 medically managed (75%) and surgically managed (76%), with no significant differences by pathogen. Full recovery at 3 months was noted in 10/20 (50%) medically managed vs. 8/41 (19.5%) surgically managed (P = 0.02). Poor outcomes were not associated with joint location, pathogen, type of joint drainage, number of days to OR, or duration of antibiotics. Blacks had increased odds of poor outcome (OR 9.5; 95% CI 1.3–65.4).

Conclusion. We detected no statistically significant differences in outcomes at 12 months between patients managed medically vs. surgically for native joint septic arthritis. Full recovery at 3 months was significantly higher among the medical group.

Disclosures. All authors: No reported disclosures.

201. Assessment of Musculoskeletal Infection Society (MSIS) Diagnostic Criteria as Predictors of Treatment Success in Hip Arthroplasty Infections Treated with Two-Stage Exchange

Michael Henry, MD; Celeste Russell, MPH; Allina Nocon, MPH; Geoffrey Weistrich, MD and Andy Miller, MD; Infectious Diseases, Hospital for Special Surgery, New York, New York, New York, Hospital for Special Surgery, New York, New York, New York, 4Complex Joint Reconstruction Center, Hospital for Special Surgery, New York, New York, New York, Infectious Disease, Weill Cornell Medical College, New York, New York

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Background. PJIs are challenging to eradicate. New treatment paradigms are needed.

Methods. We assembled a cohort of patients undergoing surgical revision for hip or knee PIs from January 1, 2010 until December 31, 2014 at our referral hospital by searching procedure descriptions from operative listings. Patient characteristics were extracted by chart review. Treatment failure (TF) was defined by PI recurrence requiring surgery, receipt of suppressive antibiotics, amputation, or death.

Results. 243 individuals with a PI undergoing a revision surgery were included. Median age was 69 years, 111 (46%) were males, 118 (49%) involved hips, 125 (51%) knees, incision and drainage was performed in 53 (22%), a two-stage procedure was undertaken in 168 (69%), and a one-stage procedure in 18 (7%). Most PIs were monomicrobial (50%); with coagulase negative staphylococci (35%) and Staphylococcus aureus (18%) the most common. TF occurred in 85/171 (47%); 53 (62%) required revision surgery, 23 (27%) chronic suppressive antimicrobials, 5 (6%) amputation, and 4 (5%) died (Table 1). On univariate analysis incision and drainage was associated with failure (OR 2.8, 95% CI 1.3–5.8, P = 0.002) while a two-stage procedure (OR 0.4, 95% CI 0.2–0.8, P = 0.009) were protective. No risk factors for TF were identified on multivariable analysis.

Table 1. Characteristics and PI treatment outcome

| Characteristic | Success (n = 96) | Failure (n = 85) | P |
|---------------|-----------------|-----------------|---|
| Age (median, IQR) | 71.5 (60–76) | 68 (62–76) | 0.88 |
| Male sex | 80 (82%) | 50 (62%) | 0.07 |
| Joint type | 46 (48%) | 44 (52%) | 0.60 |
| Knee | 50 (62%) | 41 (48%) | 0.29 |
| Indication | Osteoarthritis | 63 (66%) | 57 (67%) |
| | Trauma | 13 (14%) | 14 (17%) |
| | Rheumatoid arthritis | 4 (4%) | 9 (11%) |
| | Other | 16 (17%) | 5 (6%) |
| Prosthetic joint | 38 (40%) | 33 (39%) | 0.92 |
| Revision | 58 (60%) | 52 (61%) | |
| Procedure | Incision and drainage | 12 (14%) | 28 (33%) |
| | Two stage | 72 (75%) | 48 (58%) |
| | One stage | 9 (9%) | 7 (8%) |
| Knee spacer type | Dynamic | 22 (58%) | 10 (42%) |
| | Static | 16 (42%) | 14 (58%) |
| Symptoms >21 days | 83 (87%) | 60 (71%) | 0.008 |

Conclusion. PJs are challenging to eradicate. New treatment paradigms are needed.

Disclosures. A. McGee, Hoffman La Roche: Investigator, Research grant. GSK: Investigator, Research grant. Sanofi pasteur: Investigator, Research grant.

202. Factors Associated with Success in Revision Surgery for Infected Hip and Knee Arthroplasties

Christophor Kandel, MD; David Backstein, MD, MEd, FRCS(C); Abhilash Saja, BSc, MD and Allison McGregor, MD, MSc; 1Department of Infectious Diseases, University of Toronto, Toronto, ON, Canada, 2Surgery, Sinai Health System, Toronto, ON, Canada, 3Division of Infection Control, Sinai Health System, Toronto, ON, Canada, 4Infection Control, University of Toronto, Toronto, ON, Canada

Session: 45. Clinical: Bone and Joint Infection
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Background. Patients with prothetic joint infections (PJs) often fail treatment. We aimed to describe the characteristics and outcomes of PJs managed at a tertiary institution in Canada.

Methods. We assembled a cohort of patients undergoing surgical revision for hip or knee PJs from January 1, 2010 until December 31, 2014 at our referral hospital by searching procedure descriptions from operative listings. Patient characteristics were extracted by chart review. Treatment failure (TF) was defined by PJ recurrence requiring surgery, receipt of suppressive antibiotics, amputation, or death.

Results. 243 individuals with a PJ undergoing a revision surgery were included. Median age was 69 years, 111 (46%) were males, 118 (49%) involved hips, 125 (51%) knees, incision and drainage was performed in 53 (22%), a two-stage procedure was undertaken in 168 (69%), and a one-stage procedure in 18 (7%). Most PIs were monomicrobial (50%); with coagulase negative staphylococci (35%) and Staphylococcus aureus (18%) the most common. TF occurred in 85/171 (47%); 53 (62%) required revision surgery, 23 (27%) chronic suppressive antimicrobials, 5 (6%) amputation, and 4 (5%) died (Table 1). On univariate analysis incision and drainage was associated with failure (OR 2.8, 95% CI 1.3–5.8, P = 0.002) while a two-stage procedure (OR 0.4, 95% CI 0.2–0.8, P = 0.009) were protective. No risk factors for TF were identified on multivariable analysis.

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| | Other | 16 (17%) | 5 (6%) |
| Prosthetic joint | 38 (40%) | 33 (39%) | 0.92 |
| Revision | 58 (60%) | 52 (61%) | |
| Procedure | Incision and drainage | 12 (14%) | 28 (33%) |
| | Two stage | 72 (75%) | 48 (58%) |
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| Knee spacer type | Dynamic | 22 (58%) | 10 (42%) |
| | Static | 16 (42%) | 14 (58%) |
| Symptoms >21 days | 83 (87%) | 60 (71%) | 0.008 |

Conclusion. PJs are challenging to eradicate. New treatment paradigms are needed.

Disclosures. A. McGee, Hoffman La Roche: Investigator, Research grant. GSK: Investigator, Research grant. Sanofi pasteur: Investigator, Research grant.