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87. Epidemiology and Trends of Pertussis among Infants: United States, 2000–2015

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Session: 29. Identification, Treatment, and Prevention of Pediatric Bacterial Pathogens
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Background. Pertussis, a cyclic respiratory disease, causes the greatest morbidity and mortality among infants, particularly those too young to be vaccinated. Following a resurgence of pertussis in the 1990s, a recommendation was made in 2012 to vaccinate during every pregnancy in order to prevent infant disease. We describe pertussis trends from 2000–2015 among U.S. infants aged <1 year.

Methods. We analyzed infant pertussis cases reported through the National Notifiable Diseases Surveillance System from 2000 to 2015. Incidence rates (cases per 100,000 population) among various age groups (<2, 2–<4, 4–<6, and 6–<12 months) were calculated using National Center for Health Statistics population estimates as denominators. Negative binomial regression was used to estimate the annual average percent change with a linear trend; $P < 0.05$ was significant.

Results. From 2000 to 2015, 48,909 infant pertussis cases and 255 deaths were reported; infants aged <2 months accounted for 38.7% of cases. The age distribution of infant cases was stable from 2000 to 2009 but changed from 2010 to 2015 (Fig. 1), as the proportion of cases aged 4–<12 months increased annually on average by 4.7% ($P < 0.001$). Annual incidence was highest among <2 month olds; however, rates increased among older infants (Fig. 2); 7% average annual increase among infants aged 4–<6 months and 11% among infants aged 6–<12 months ($P < 0.001$ for each). The proportion of infants hospitalized decreased over time in each age group ($P < 0.001$ for all) with the largest annual average declines among 4–<6 (–5.1%) and 6–<12 month (–5.9%) olds. For all age groups, hospitalization rates were relatively stable, but non-hospitalization rates increased ($P < 0.05$ for all). The case-fatality ratio (CFR) was highest among <2 month olds (1.6%); CFRs decreased over time among <2 and 2–<4 month olds ($P < 0.05$ for each).

Conclusion. Pertussis incidence remains highest among infants aged <4 months, although the age distribution appears to be changing. Decreasing proportions of infants hospitalized may suggest a true decline in disease severity or an increase in reporting of less severe disease. Ongoing monitoring of infant pertussis is needed to better understand the impact of vaccinating pregnant women to prevent pertussis in young infants.

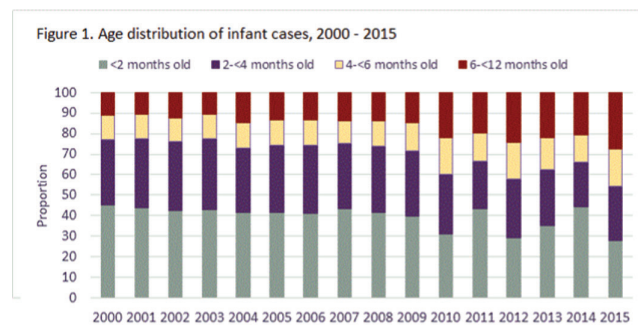
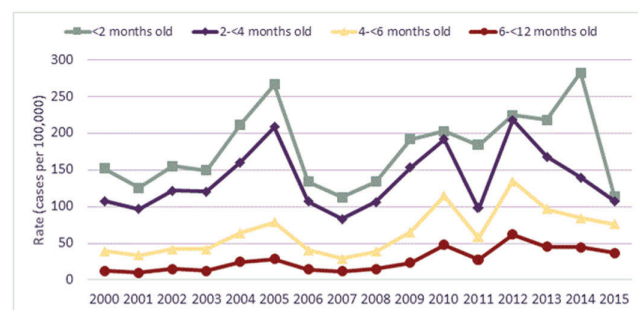


Figure 1. Age distribution of infant cases, 2000–2015



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88. Risk Factors for Early Hip or Knee Prosthetic Joint Infection (PJI): Analysis of a Nationwide American Insurance Claims Dataset

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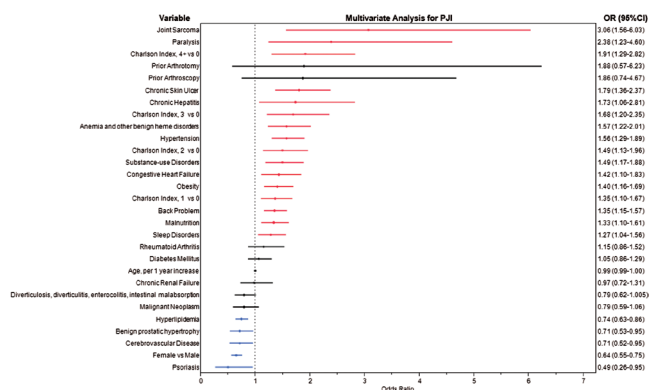
Session: 30. It's not just Bones: Skin and Bones
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Background. While several studies have identified risk factors for PJI using insurance claims data, these data sets have been limited to a single regional insurance dataset or to the Medicare population. We sought to investigate risk factors for early PJI among patients undergoing total hip or knee arthroplasty (THKA).

Methods. All patients who underwent primary THKA between January 1, 2004 and July 31, 2014 with 12 months of continuous preceding medical and pharmacy insurance coverage were included in the study. The primary outcome of PJI required both a compatible procedure code and a diagnostic code during an inpatient stay from the time of THKA through 90 days after discharge. Comorbidities were based on ICD-9 codes in the preceding 12 months and patients with a prior diagnosis of PJI during that time period were excluded. Univariate and multivariate analysis was performed using logistic regression.

Results. A total of 147,053 patients underwent THKA during the study period, including 97,448 patients with TKA and 49,605 with THA. PJI occurred in 754 (0.5%) patients. Female gender was independently associated with lower odds of PJI (Figure). A number of biologically plausible factors were associated with increased risk, including chronic skin ulcer, obesity, substance use disorders, joint sarcoma, and malnutrition. The adjusted odds of PJI increased in a stepwise fashion with each increase in the Charlson comorbidity index (CCI), with those with a score of 4 or more having a nearly 2-fold adjusted odds of PJI compared with a score of 0 (OR 1.91; 95% CI 1.29–2.82). Previously observed risk factors diabetes mellitus, rheumatoid arthritis, and chronic renal failure were associated with increased odds of PJI on univariate analysis, but not after adjustment.

Conclusion. These data identify several potentially modifiable risk factors for preoperative optimization, including obesity, malnutrition, chronic skin ulcers, and substance-use disorders. The level of comorbidity as assessed by the CCI provides a rough estimate of the increasing risk of PJI. The pathobiology of additional risk factors observed here deserves further study.



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89. U.S. Combat-related Invasive Fungal Wound Infection (IFI) Epidemiology and Wound Microbiology: Afghanistan Theater 2009–2014

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Background. Culturing combat-related wounds often yields both fungi and bacteria. It is difficult to differentiate fungal contamination from infection, and objective criteria that identify patients at risk for IFI are needed. This study was designed to characterize IFI among US combat casualties in the Afghanistan Theater.

Methods. This retrospective study includes subjects with any laboratory evidence of fungi (either histopathology or cultures). Wounds with ongoing necrosis and laboratory evidence of infection were classified as IFI. Wounds with laboratory evidence of fungal infection, but without ongoing necrosis were classified as either highly suspicious wounds based