

Charcot Neuroarthropathy and Osteomyelitis in Diabetic Populations in Texas

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AUTHOR DISCLOSURES

The authors have no disclosures.

INTRODUCTION: Charcot Neuroarthropathy (CN) and osteomyelitis are complex diseases of the bone and joints that, if not properly diagnosed and treated, can lead to serious and life-threatening complications. Both diseases pose significant challenges for diagnosis and treatment. This study examines the epidemiologic trends of these diseases and related amputations in the diabetic population of Texas, a state with one of the highest rates of diabetes in the United States.

METHODS: We used data from the Texas Department of State Health Services on conditions diagnosed in inpatient encounters in all hospitals in Texas. Using ICD-9 and ICD-10 codes, we extracted data for patients with diabetes and Charcot's ankle/foot or osteomyelitis, along with data for related major or minor amputations. Data extracted included: diagnoses, race, and gender. Population rates were estimated using census data. We included only subjects with a recorded age; rates were calculated per 1000 population and standardized by age using 2019 population estimates. Rates were also examined separately in age groups: 18-44, 45-64, 65-74, 75+.

RESULTS: This study shows that the overall and age-standardized rates of CN and osteomyelitis increased each year from 2006-2016, except for a downward trend from 2014-2016.

Poisson regression for all CN reinforces this trend, with significant increases in the incidence rate ratio compared to 2006 for each year from 2008-2016. When age group is included in the regression, all years, except 2007, show a significant increase relative to 2006, and all age groups have increased rates relative to the 18-44 age group (7.237, 9.337, 5.418 for 45-64, 65-74, and 75+, respectively). It was also observed that amputations, both major and minor, in patients with CN have increased (0.0035 to 0.0088 and 0.0025 to 0.009 respectively).

Poisson regression for osteomyelitis also reinforced these trends, with significant increases in risk ratios for osteomyelitis and amputation rates (total, major, and minor) relative to 2006 and in all age groups relative to the 18-44 age group. There was a significant increase in osteomyelitis rates every year compared to 2006, and increases in all age groups compared to the 18-44 age group (1.331 in 2016; 9.413, 15.046, 15.603 for 45-65, 65-74, and 75+, respectively).

DISCUSSION: This preliminary analysis highlights the increasing prevalence of CN, osteomyelitis, and related amputations in all diabetic patients for the years 2006-2016, and in all age groups in Texas. Although increasing diabetes rates may contribute to the observed trends in osteomyelitis, it does not exclusively explain them. The increasing rates of CN, osteomyelitis, and amputations highlight the need for further research and standardized strategies for diagnosis and management. Further research should investigate possible interventions to mitigate the rise in diabetic CN, osteomyelitis, and associated amputations.

SIGNIFICANCE/CLINICAL RELEVANCE: The rates and counts of diabetic Charcot Neuroarthropathy and Osteomyelitis and resultant subsequent amputation are increasing, despite advancements in care and general downward trend in diabetic amputation. This study brings attention to the need for research into the diagnosis and management of these conditions and what methods to stop these rates from increasing.

IMAGES AND TABLES:

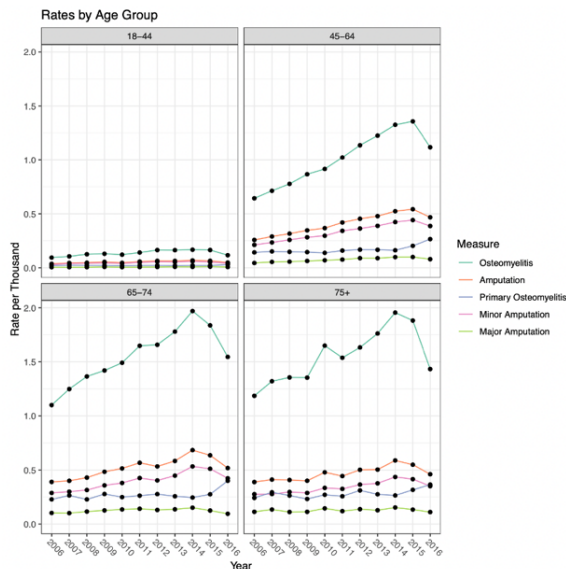


Figure 2: Rates of Osteomyelitis, Amputation (major, minor, total), and Primary Osteomyelitis from 2006-2016 by age-group

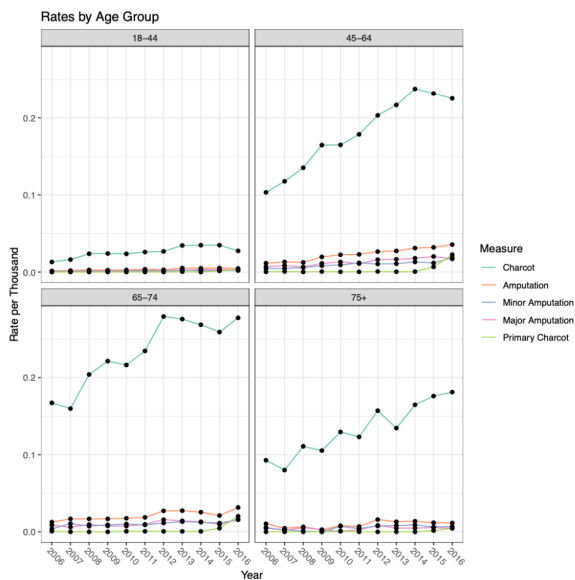


Figure 2 - Rates of Charcot Diagnosis, Amputation, Minor Amputation, Major Amputation, and Primary Charcot Diagnosis by Age Group in Texas from 2006-2016