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“Predictors of chronic osteomyelitis between comorbid conditions versus social determinants of health”

Background: Osteomyelitis often requires surgery and a long course of antibiotics to treat. However, recurrent infection can still occur. Moore *et al.* found that health comorbidities, such as coronary artery disease (CAD) and chronic kidney disease (CKD), are risk factors for recurrent infection¹. Social determinants of health (SDOH) are other risk factors important to consider for poor health outcomes, including recurrence of osteomyelitis. One study found that living in poverty-driven neighborhoods increases mortality from trauma-related injury². Moreover, recurrent osteomyelitis is a challenging diagnosis as it can lead to adverse events related to prolonged antibiotics³. It is, therefore, imperative to understand the risk factors that contribute to persistent infection. This study aims to explore how well SDOH predict recurrent osteomyelitis compared to comorbidities.

Methods: This is a retrospective cohort study of adult patients diagnosed with chronic osteomyelitis in New Orleans. 27 medical records were used to identify predictors of osteomyelitis, including comorbidities to calculate the Charlson Comorbidity Index (CCI), and SDOH, such as Area Deprivation Index (ADI). Logistic regression analysis was used to test for associations between comorbidities and SDOH.

Results: Of the 27 records, 33.3% were female and 66.7% were male, with an average age of 44.5. Race demographics comprised of Black/African American (55.5%), White (44.4%), and majority non-Hispanic (96.3%). Medicaid (44.4%) was the most common insurance, followed by Medicare (25.9%), free care (14.8%), inmate (11.1%), and private (3.70%). Recurrence of osteomyelitis occurred in 6 (22.2%) patients. The range of ADI was 1 (least disadvantaged) to 10 (most disadvantaged), with a mean of 6.35 and median of 7 (N=24). Four cases were excluded in average ADI due to incarceration status. The range of CCI was 0 to 7, with a mean of 1.48 (mild grade) and median of 0 (no comorbidity). Regression analysis did not identify any significant associations between recurrence and CCI or SDOH.

Conclusions: We observed that 22.2% of patients had recurrent osteomyelitis. The most common insurance status (Medicaid=44.4%) and the central tendency of ADI (M=6.35, Mdn=7) suggest a more disadvantaged socioeconomic status while the mild average Charlson Comorbidity Index (1.48) suggest less comorbidities. These results are preliminary, as data collection is ongoing until 350 records are abstracted, allowing for a more robust discussion of potential significant findings or associations.

1. Moore CL, Hingwe A, Donabedian SM, et al. Comparative evaluation of epidemiology and outcomes of methicillin-resistant staphylococcus aureus (MRSA) USA300 infections causing community- and healthcare-associated infections. *International journal of antimicrobial agents*. 2009;34(2):148-155. <https://www.clinicalkey.es/playcontent/1-s2.0-S0924857909001150>. doi: 10.1016/j.ijantimicag.2009.03.004.

2. Loberg JA, Hayward RD, Fessler M, Edhayan E. Associations of race, mechanism of injury, and neighborhood poverty with in-hospital mortality from trauma: A population-based study in the Detroit metropolitan area. *Medicine (Baltimore)*. 2018 Sep;97(39):e12606. doi: 10.1097/MD.00000000000012606. PMID: 30278575; PMCID: PMC6181609.

3. Napierala MA, Bellamy JL, Murray CK, Hurley RK Jr, Wenke JC, Hsu JR. Risk of Obtaining Routine Cultures During Presumed Aseptic Orthopaedic Procedures. *J Surg Orthop Adv*. 2017 WINTER;26(4):239-245. PMID: 29461197.