

COMORBID MODIFIABLE RISK FACTORS ASSOCIATED WITH RECURRENT CHRONIC OSTEOMYELITIS

Charlotte Pearson, Angella Chang, Thuc Truong, Renee Breaux, and Jessica Rivera

Department of Orthopedic Surgery

Louisiana State University Health Sciences Center, New Orleans, LA, USA



Background

- The diagnosis of chronic osteomyelitis indicates persistent or recurrent bone infection after injury.
- The incidence of osteomyelitis is unknown, but in the United States it may be as high as 50,000 cases annually, and infection has been found to recur in 33% of treated cases.¹
- Risk factors associated with recurrent osteomyelitis include intraoperative blood transfusions, infection by *P. aeruginosa*, methicillin-resistant *Staphylococcus aureus* (MRSA) and co-morbid conditions such as coronary artery disease and chronic kidney disease.²
- Little research has focused on comorbid risk factors associated with recurrent chronic osteomyelitis.
- Substance abuse problems are reported in approximately 15% of osteomyelitis patients, and low socioeconomic status is associated with poorer outcomes and higher mortality following trauma and surgery.^{3, 4, 5}
- Research on outcomes of common injuries that occur in potentially disadvantaged populations should include social determinants of health and comorbid mental health conditions.

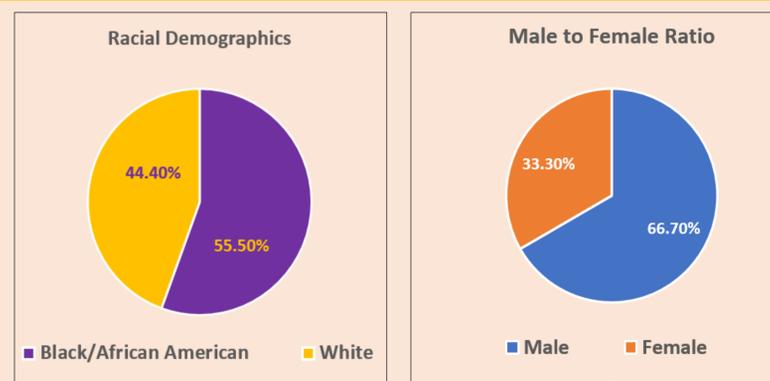
Study objective

The current study seeks to identify what comorbid modifiable risk factors are associated with recurrent chronic osteomyelitis.

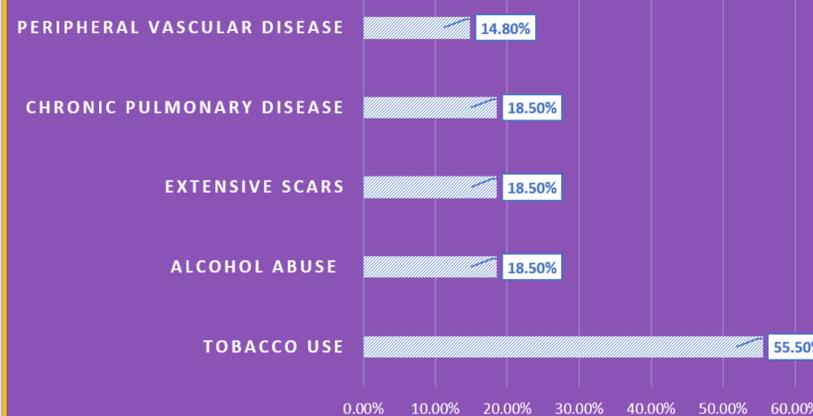
Methods

- This retrospective cohort study collected data from University Medical Center's Orthopedic Clinic in New Orleans, Louisiana.
- Chart abstraction was performed for medical records of 27 adult patients diagnosed with chronic osteomyelitis.
- The Charlson Comorbidity Index, American Society of Anesthesiologist Score, and Cierny Mader Classification System were used to evaluate patient comorbidities.
- Comorbidities of interest included alcohol abuse, diabetes, age >70, tobacco use, chronic lymphedema, extensive scars, peripheral vascular disease, chronic pulmonary disease, and diabetes with end organ injury.
- Logistic regression was performed test for associations between recurrent osteomyelitis infection and comorbidities.

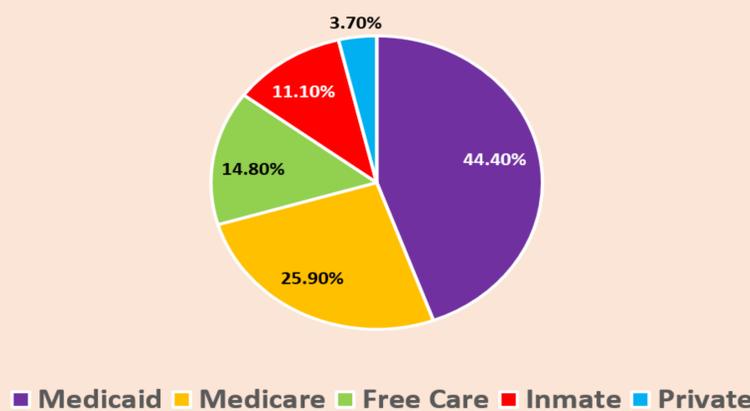
Patient Demographics



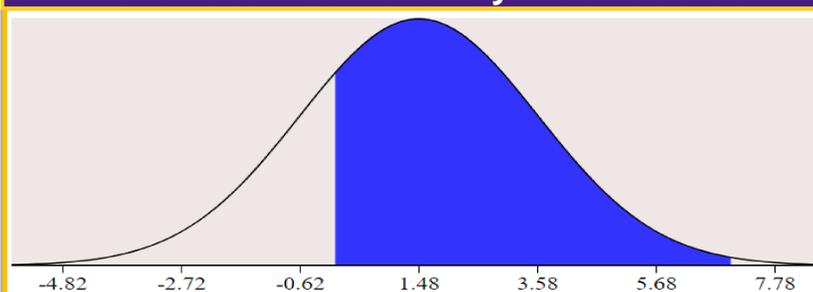
Most Common Comorbidities Associated with Chronic Osteomyelitis



Insurance Status Among Patients With Chronic Osteomyelitis



Charlson Comorbidity Index Scores



Results

- Demographics of the 27 patients indicated an average age of 44.5 with a standard deviation of 17.2.
- 66.7% of patients were male, 33.3% were female.
- Racial demographics were as follows: Black/African American (55.5%), White (44.4%), and non-Hispanic (96.3%).
- Recurrence of osteomyelitis occurred in 6 (22.2%) patients.
- The average Charlson Comorbidity Index score was 1.48 (mild), with a range of 0-7 and a mean of 0.
- The most common comorbidities were tobacco use (55.5%), alcohol abuse (18.5%), extensive scars (18.5%), chronic pulmonary disease (18.5%), and peripheral vascular disease (14.8%).
- Regression analysis did not identify any significant associations between recurrence and comorbidities.

Summary & Conclusion

Conclusion:

- No significant association was determined between osteomyelitis recurrence and the comorbidities of interest.
- Among patients, the most common comorbidity was tobacco use. This may be explained by nicotine's effect at fracture sites, where it decreases vascularization, increasing the chances for the development of osteomyelitis.⁶
- Alcohol abuse was also among the most common comorbidities in this patient group. Alcoholism has previously been reported as a predisposing factor for chronic osteomyelitis and is known to suppress the immune response to infection.⁷
- Chronic osteomyelitis is a severe complication that affects many patients, and understanding the relationship between comorbidities and this pathology will improve both patient well-being and provider efficacy.

Future Directions:

This study is ongoing and will include more charts to increase power.

References

- Rubin RJ, Harrington CA, Poon A, Dietrich K, Greene JA, Moiduddin A. The economic impact of *Staphylococcus aureus* infection in New York City hospitals. *Emerg Infect Dis.* 1999 Jan-Feb;5(1):9-17.
- Jorge LS, Chueire AG, Fucuta PS, Machado MN, Oliveira MGL, Nakazone MA, Salles MJ. Predisposing factors for recurrence of chronic posttraumatic osteomyelitis: a retrospective observational cohort study from a tertiary referral center in Brazil. *Patient Saf Surg.* 2017 Jun 2;11:17. doi: 10.1186/s13037-017-0133-1.
- Walter N, Rupp M, Baertl S, Hinterberger T, Alt V. Prevalence of psychological comorbidities in bone infection. *J Psychosomatic Research.* 2022; 157: 110806
- Crawford S, Schold J. Association Between Geographic Measures of Socioeconomic Status and Deprivation and Major Surgical Outcomes. *Med Care.* 2019 Dec;57(12):949-959.
- 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.
- Tarakji B, Cil A, Butin RE, Bernhardt M. Adverse Effects of Smoking on Musculoskeletal Health. *Mo Med.* 2017 Jul-Aug;114(4):268-271.
- Parsons B, Strauss E. Surgical management of chronic osteomyelitis. *Am J Surg* 2004;188(Suppl):57-66.