Smoking as a Modifiable Risk Factor of Prosthetic Joint Infection in Total Joint Arthroplasty: A Single Center Retrospective Review

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INTRODUCTION:
Smoking has been identified as a risk factor for prosthetic joint infections (PJI), a devastating complication in total joint arthroplasty (TJA). Despite institutional efforts to counsel patients on the risks of smoking in the perioperative period, there is limited literature quantifying the risks of smoking in the development of PJI following total joint arthroplasty. The purpose of this study is to determine the relationship between smoking status and risk of developing PJI in TJA.
METHODS:
A retrospective review was performed of adult patients who underwent total hip or knee arthroplasty between 2012 and 2024. Patients were stratified into current, former, and never smokers. A multivariate logistic regression model assessed the association between self-reported smoking status and PJI, adjusting for sex, BMI, historical exposure (pack-year history), age adjusted Charlson Comorbidity Index (CCI), and alcohol use (low, moderate, and heavy). Results are reported as Odds Ratio [OR], 95% Confidence Interval [95%CI], and p-value.
RESULTS:
Among 13,526 patients, current smoking was significantly associated with increased odds of developing a PJI compared to never smokers (OR: 2.26, 95%CI: 1.02–5.03, p=0.046). Former smokers had similar odds to never smokers (OR: 1.07, 95%CI: 0.72–1.60, p=0.740). Male sex (OR: 1.39, 95%CI: 1.07–1.79, p=0.012) and higher CCI (OR: 1.09, 95%CI: 1.05–1.12, p<0.001) were also associated with increased risk. Low alcohol use compared to no consumption was associated with a decreased odds of developing a PJI (OR: 0.66, 95%CI: 0.49–0.87,p=0.004), but no association was found for moderate (OR: 0.63, 95%CI: 0.32–1.26, p=0.197) and heavy alcohol use (OR: 0.68, 95%CI: 0.21–2.20, p=0.524).
DISCUSSION AND CONCLUSION:
Current smoking was independently associated with higher odds of PJI while former smokers did not have increased risk. Age adjusted CCI and male sex were also risk factors for developing PJI. Low alcohol use was associated with reduced odds of PJI, likely reflecting overall healthier patient profiles rather than a protective effect of alcohol itself, as no significant associations were observed for moderate or heavy use. These findings support smoking cessation as a modifiable risk factor in TJA patients.