

Mortality and Complications in Patients with Chronic Kidney Disease and Lower Extremity Trauma

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Purpose: Moderate to severe chronic kidney disease (CKD, stages 3-5) has been shown to be an independent risk factor for sustaining a fracture. Furthermore, there are high rates of morbidity and mortality associated with fractures in patients with CKD, although the existing literature is largely limited to hip fractures. The aims of this study were to calculate 2-year mortality rates and to determine the rate of postoperative complications in patients with moderate to severe CKD with an associated lower extremity fracture.

Methods: A retrospective review using an electronic medical record at our academic Level I trauma center between 2008 and 2019 identified all patients who underwent operative fixation of a lower extremity fracture (pelvis to ankle) and also had a diagnosis of CKD stages 3 through 5 prior to injury. Demographics including age-adjusted Charlson Comorbidity Index (CCI), fracture type, complications (deep infection, hardware failure, nonunion/malunion, amputation), and mortality within 2 years from surgery were collected. The summary statistics between CKD groups (CKD 3/4 and CKD 5) were compared using analysis of variance and Fisher's exact tests, and its association with mortality and complication was adjusted for age, race, CCI, and body mass index (BMI) using logistic regression.

Results: A total of 162 patients with a surgically repaired lower extremity fracture were included. Fractures included pelvis/acetabulum (4.8%), hip (23.4%), femoral/tibial shafts (17.6%), periarticular (27.1%), and ankle (27.1%). Demographics were similar between the CKD 3/4 and CKD 5 cohorts except for age, race/ethnicity, and BMI. Overall mortality rate at 1 year was 21.6% (18.2% and 28.8% for CKD 3/4 and CKD 5, respectively) and at 2 years was 34.0% (28.2% and 46.2%). Overall complication rate was 27.2% (24.5% and 32.7%). After adjusting for confounding factors, multivariate analysis demonstrated that with increasing CKD severity (stage 5 vs stage 3/4), there was a positive association (odds ratio [OR] 3.38, 95% confidence interval [CI] 1.49,7.98) with 2-year mortality.

Conclusion: Our study demonstrates a high mortality and complication rate for patients with moderate to severe kidney disease who undergo operative fixation of a lower extremity fracture. Nearly half of the patients with end stage renal disease (CKD stage 5) did not survive at 2 years following fixation. These findings can be used to counsel patients and give them a realistic expectation of possible results and complications. Further research into the optimal treatment for specific lower extremity fractures is warranted.