Postoperative Outcomes of Total Knee Arthroplasty in Patients with Alcohol Use Disorders: A Retrospective Propensity-Matched Analysis

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INTRODUCTION: Alcohol use disorder (AUD) has been associated with post-surgical complications. Previous studies were limited by national, single database sources and evaluated patients from unmatched cohorts. The purpose of this study was to characterize differences in medical and surgical complications of matched cohorts of patients with versus without AUD undergoing primary total knee arthroplasty (TKA) and to determine the effect that common AUD associated co-morbidities had on the hazard of post-operative complications.

METHODS: A global de-identified patient database called TriNetX was used to gather and analyze data for this study. Patients who underwent primary TKA from 2015 to 2025 were separated into cohorts with and without AUD using ICD-10 and CPT codes. A total of 6,634 patients with TKA and AUD were propensity matched to the cohort without AUD to balance the comorbidities between the two groups. Univariate analysis was performed on these cohorts to examine the relationship between AUD and postoperative complications. A subgroup analysis was performed using the TKA/AUD cohort with surgical complications compared to AUD patients without surgical complications. Finally, a Cox proportional hazards analysis was conducted to determine the effect of comorbidities and pre-operative labs on the hazard of post-operative complications.

RESULTS: Patients with AUD had a significantly higher risk of acute renal failure, respiratory failure, delirium, and needing a transfusion at 30 days and 90 days after surgery. After 30 days, there was an increased risk of an infection following a procedure. After 90 days and 1 year, there was an increased risk of wound dehiscence, infection following procedure, and revision arthroplasty. After 5 years, there was an increased risk of joint infection, wound dehiscence, superficial skin and soft tissue infection, infection following procedure, periprosthetic fracture around knee joint, and revision arthroplasty. The cohort of TKA/AUD patients with surgical complications had a significantly higher percentage of diabetes, tobacco use, essential hypertension, depression, anxiety, bipolar disorder, and atrial fibrillation, than the cohort without surgical complications. These patients also had significantly lower pre-operative hemoglobin, albumin, ALT, and higher INR than patients without complications. The Cox proportional hazards model showed a significantly increased hazard of post-operative complications for hypertension, hemoglobin of 6 – 10 g/dL, and albumin 2.5 – 3 g/dL in a cohort of patients with AUD.

DISCUSSION: This study suggests that patients with AUD have a significantly higher risk of both medical and surgical complications after primary TKA, aligning with existing evidence. Additionally, patients with AUD who had post-operative complications had significantly worse pre-operative labs and higher percentages of comorbidities, demonstrating the importance of multidisciplinary care to mitigate these complications. This study is potentially limited by errors in medical coding and the possibility of residual confounding despite propensity score matching.

SIGNIFICANCE/CLINICAL RELEVANCE: AUD markedly increases patients' risks for serious complications including infection, acute renal and respiratory failure, and revision arthroplasty. Given the multisystem effects of AUD, an interdisciplinary approach is essential to reduce the complication risks.

	30 Days			*90 Days*		
	Risk ratio	**95% Confidence Interval**	**P Value**	**Risk ratio**	**95% Confidence Interval**	**P Value**
Acute Myocardial Infarction	0.787	0.47 - 1.32	0.3611	0.772	0.52 - 1.14	0.1941
Pulmonary Embolism	1.083	0.77 - 1.53	0.6557	1.046	0.78 - 1.4	0.7628
DVT	1.053	0.82 - 1.36	0.6923	1.077	0.87 - 1.34	0.4984
Injury of unspecified body region	1.341	0.91 - 1.98	0.1379	1.205	0.89 - 1.62	0.2195
Transfusion	**2.067**	**1.34 - 3.19**	**0.0008**	**1.900**	**1.3 - 2.78**	**0.0008**
Acute Renal Failure	**1.552**	**1.23 - 1.95**	**0.0002**	**1.438**	**1.19 - 1.74**	**0.0002**
Pneumonia	1.111	0.77 - 1.6	0.5725	1.119	0.84 - 1.50	0.4505
Respiratory Failure	**1.538**	**1.16 -2.04**	**0.0026**	**1.381**	**1.09 - 1.75**	**0.0067**
Delirium	**1.611**	**1.25 -2.08**	**0.0002**	**1.543**	**1.26 - 1.89**	**<0.0001**
UTI	1.262	0.91 - 1.74	0.1585	1.021	0.81 - 1.29	0.8569
Stroke (CVA)	0.907	0.59 - 1.4	0.6577	1.058	0.76 - 1.47	0.7358

Table 1: *Risk of medical complications after TKA in patients with AUD (N=6,634)*