

How Does Alcohol Use Disorder Impact Outcomes following Arthroscopic Rotator Cuff Repair?

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INTRODUCTION:

Studies have shown that falls to be associated with development of acute rotator cuff tears, which can potentially be a risk factor for patients who have gait instability as those seen in patients who consume large amounts of alcohol. As the prevalence of alcohol use disorder (AUD) continues to increase within the United States; large sample sized studies evaluating outcomes in patients who have an AUD undergoing arthroscopic rotator cuff repair (ARCR) is limited. Therefore, the aims of this investigation were to determine whether AUD patients undergoing ARCR have higher rates of: 1) medical complications; 2) readmission rates; and 3) costs of care.

METHODS: A retrospective level III case-control investigation from January 1, 2010 to October 31, 2020 of a private insurance payor was performed. Patients and complications were identified using International Classification of Disease, Ninth Revision (ICD-9), ICD-10, and Current Procedural Terminology (CPT) codes. The database was initially queried for all patients who underwent ARCR. Patients with a diagnosis of AUD were filtered from this base population and served as the study cohort. Conversely, those patients without AUD who underwent ARCR represented the comparison cohort. To minimize any potential confounding, study group patients were 1:5 ratio matched to the comparison cohort with respect to age, sex, and the following comorbid conditions: coronary artery disease, diabetes mellitus, hypertension, obesity – defined as a body mass index greater than 30 kilograms per meter squared (kg/m^2), and tobacco use. Ratio matching was done to increase the overall sample size and power of the investigation. The query yielded 140,886 patients within the study ($n = 23,484$) and comparison ($n = 117,402$) cohort. Matching was successful as there was no statistical difference between the two cohorts based on the matching parameters (Table 1). Primary endpoints of the study were to analyze and compare 90-day medical complications, 90-day readmission rates, in addition to day of surgery and total global 90-day episode of care costs. Ninety-day medical complications analyzed included: cerebrovascular accidents, deep vein thromboses, myocardial infarctions, pneumoniae, pulmonary emboli, surgical site infections, urinary tract infections, and venous thromboemboli. To determine the association of AUD on medical complications and readmissions, logistic regression analyses were used to calculate the odds-ratios (OR) and 95% confidence intervals (95%CI) for each of the aforementioned complications and readmissions. Welch's *t*-tests were used to determine statistical significance for total global 90-day episode of care time interval costs between the cohorts. To minimize any potential confounding, a Bonferroni correction was performed to increase the threshold for statistical significance. As such, an alpha value of 0.004 was considered to be statistically significant. This was attained by dividing 0.05 by the total number of dependent variables analyzed ($n = 12$).

RESULTS: AUD patients were found to have a higher frequency and odds of developing adverse events within 90-days following the index procedure (19.03 vs. 3.38%; OR: 6.47, 95%CI: 6.13 to 6.83, $p < 0.0001$). Study group patients were found to have higher rates and odds of developing pneumoniae (6.14 vs. 0.71%; OR: 9.08, 95%CI: 8.33 to 9.90, $p < 0.0001$), cerebrovascular accidents (1.78 vs. 0.25%; OR: 7.17, 95%CI: 6.17 to 8.33, $p < 0.0001$), myocardial infarctions (0.91 vs. 0.15%; OR: 6.02, 95%CI: 4.93 to 7.35, $p < 0.0001$), urinary tract infections (6.22 vs. 1.16%; OR: 5.63, 95%CI: 5.22 to 6.07, $p < 0.0001$), deep vein thromboses (1.09 vs. 0.24%; OR: 4.66, 95%CI: 3.93 to 5.52, $p < 0.0001$), in addition to other medical complications (Table 2).

DISCUSSION AND CONCLUSION: After adjusting for baseline covariates, this investigation of over 140,000 patients demonstrates AUD to be associated with higher rates of medical complications, readmission rates, and costs of care. Future investigations should stratify the severity of AUD on the dependent variables analyzed within this investigation. The current study is vital as it can allow orthopaedists and other healthcare professionals to educate patients who have AUD on the potential outcomes following their surgical procedure.

Demographics	Alcohol Use Disorder		Case-Matched Cohort		<i>p</i> -value
	n	%	n	%	
Age (Years)					0.99
15 to 19	50	0.21	252	0.21	
20 to 24	68	0.29	333	0.28	
25 to 29	115	0.49	572	0.49	
30 to 34	302	1.29	1,502	1.28	
35 to 39	644	2.74	3,218	2.74	
40 to 44	1,538	6.55	7,676	6.54	
45 to 49	3,006	12.80	15,030	12.80	
50 to 54	4,434	18.88	22,178	18.89	
55 to 59	4,946	21.06	24,734	21.07	
60 to 64	3,969	16.90	19,845	16.90	
65 to 69	2,515	10.71	12,575	10.71	
70 to 74	1,518	6.46	7,590	6.46	
75 to 79	366	1.56	1,830	1.56	
80<	13	0.06	65	0.06	
Sex					0.99
Female	7,451	31.73	37,237	31.72	
Male	16,033	68.27	80,167	68.28	
Comorbidities					
CAD	7,400	31.51	36,996	31.51	0.99
Diabetes Mellitus	10,131	43.14	50,634	43.13	0.99
Hypertension	18,941	80.65	94,697	80.66	0.99
Obesity	10,055	42.82	50,252	42.80	0.99
Tobacco Use	15,565	66.28	77,807	66.27	0.99

Table 1. Comparison of Baseline Demographics Between Alcohol Use Disorder and Case-Matched Cohort Undergoing Arthroscopic Rotator Cuff Repair. CAD = Coronary Artery Disease

Medical Complications	AUD (%)	Controls (%)	OR	95%CI	<i>p</i> -value
Pneumoniae	6.14	0.71	9.08	8.33 – 9.90	<0.0001
Cerebrovascular Accidents	1.78	0.25	7.17	6.17 – 8.33	<0.0001
Myocardial Infarctions	0.91	0.15	6.02	4.93 – 7.35	<0.0001
Urinary Tract Infections	6.22	1.16	5.63	5.22 – 6.07	<0.0001
Deep Vein Thromboses	1.09	0.24	4.66	3.95 – 5.52	<0.0001
Surgical Site Infections	0.73	0.18	4.15	3.38 – 5.08	<0.0001
Venous Thromboemboli	1.53	0.45	3.43	3.00 – 3.92	<0.0001
Pulmonary Emboli	0.63	0.24	2.67	2.18 – 3.25	<0.0001
Total Medical Complications	19.03	3.38	6.47	6.13 – 6.83	<0.0001

Table 2. Differences In Ninety-Day Medical Complications Among Alcohol Use Disorder

Patients and Controls Following Arthroscopic Rotator Cuff Repair

OR = Odds-Ratio

95%CI = 95% Confidence Interval