Investigating Total Hip Arthroplasty Postoperative Complications in Patients With and Without Alcohol Use Disorder: A Retrospective Propensity-Matched Cohort Analysis

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INTRODUCTION: Per the 2023 National Survey on Drug Use and Health, an estimated 10.2% of Americans age 12 or older meet the criteria for an alcohol use disorder (AUD). Our present study sought to investigate potential correlations between recent diagnosis of AUD and postoperative complications in total hip arthroplasty (THA) patients. We hypothesized that patients who carried a diagnosis of AUD within 1 year before their operation would have higher rates of postoperative complications than those who have never received such a diagnosis.

METHODS: The TriNetX Research Network (Baltimore, MD) was used as the data source for this study. Two cohorts were established: (1) THA patients who received a diagnosis of “Alcohol abuse” or “Alcohol dependence” in the year prior to their operation (AUD cohort), and (2) THA patients who did not ever receive these diagnoses (Non-AUD cohort). All patients were at least 18 years of age and carried a diagnosis of hip osteoarthritis; patients with rheumatoid arthritis or systemic lupus erythematosus were excluded. THA procedures were performed from 01/2003-01/2023, allowing for at least 2 years of follow-up for all patients. For outcomes analysis, the cohorts were propensity score matched based on age, sex, smoking status, diabetes, and obesity. Fisher’s exact test and Chi-squared tests were used for categorical variables and Student’s t-test for continuous variables, with p values <0.01 considered significant.

RESULTS: A total of 4,282 patients met the criteria for the AUD cohort, and 154,596 patients met the criteria for the Non-AUD cohort. Compared to the Non-AUD cohort, the AUD cohort had a younger mean age in years (59.6 vs 64.9), a larger proportion of males (66.8% vs 42.7%), and higher rates of tobacco use (13.7% vs 2.5%) (all p<0.001). After propensity matching, both cohorts contained 4,238 patients, and no demographic differences achieved statistical significance. At all stages of follow-up (1, 6, 12, and 24 months), the AUD cohort demonstrated higher rates of the following: revision arthroplasty, prosthetic joint infection, periprosthetic fracture, periprosthetic dislocation, acute posthemorrhagic anemia, blood transfusion, pneumonia, lower extremity deep vein thrombosis, and acute renal failure (see Figures).

DISCUSSION AND CONCLUSION: In our study, a strong correlation was present between AUD and postoperative complications in the 2 years following a THA procedure. The strengths of our study include a large sample size, and the control of several potential confounding variables through propensity score matching. However, this study is limited by its observational nature and reliance on medical record billing diagnoses. Future investigations should seek to stratify patients by their degree of alcohol abuse, and evaluate the use of quantitative markers (such as blood alcohol level in the pre-operative phase) as predictors of complication.

Total Hip Arthroplasty Complications, Matched Cohorts

	1 Month Follow-Up				
	AUD (n=4,238)		Non-AUD (n=4,238)		p
Revision Arthroplasty	65	1.5%	22	0.5%	**<0.001**
Prosthetic Joint Infection	59	1.4%	24	0.6%	**<0.001**
Periprosthetic Fracture	43	1.0%	16	0.4%	**<0.001**
Periprosthetic Dislocation	45	1.1%	19	0.4%	**0.001**
Acute Posthemorrhagic Anemia	348	8.2%	198	4.7%	**<0.001**
Blood Transfusion	81	1.9%	40	0.9%	**<0.001**
Acute Myocardial Infarction	28	0.7%	**	N/A	N/A
Pneumonia	45	1.1%	19	0.4%	**0.001**
Pulmonary Embolism	26	0.6%	24	0.6%	0.777
Lower Extremity Deep Vein Thrombosis	66	1.6%	34	0.8%	**0.001**
Acute Renal Failure	113	2.7%	49	1.2%	**<0.001**
Wound Dehiscence	32	0.8%	21	0.5%	0.130
Superficial Surgical Site Infection	**	N/A	**	N/A	N/A
Deep Surgical Site Infection	**	N/A	**	N/A	N/A

*** - To protect patient privacy, the database does not specify values between 1 and 10*

Total Hip Arthroplasty Complications, Matched Cohorts

	6 Month Follow-Up				
	AUD (n=4,238)		Non-AUD (n=4,238)		p
Revision Arthroplasty	125	2.9%	61	1.4%	**<0.001**
Prosthetic Joint Infection	128	3.0%	62	1.5%	**<0.001**
Periprosthetic Fracture	85	2.0%	46	1.1%	**<0.001**
Periprosthetic Dislocation	104	2.5%	37	0.9%	**<0.001**
Acute Posthemorrhagic Anemia	467	11.0%	262	6.2%	**<0.001**
Blood Transfusion	108	2.5%	52	1.2%	**<0.001**
Acute Myocardial Infarction	46	1.1%	17	0.4%	**<0.001**
Pneumonia	99	2.3%	33	0.8%	**<0.001**
Pulmonary Embolism	52	1.2%	43	1.0%	0.353
Lower Extremity Deep Vein Thrombosis	108	2.5%	61	1.4%	**<0.001**
Acute Renal Failure	201	4.7%	84	2.0%	**<0.001**
Wound Dehiscence	57	1.3%	40	0.9%	0.083
Superficial Surgical Site Infection	21	0.5%	**	N/A	N/A
Deep Surgical Site Infection	**	N/A	**	N/A	N/A

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Total Hip Arthroplasty Complications, Matched Cohorts

	12 Month Follow-Up				
	AUD (n=4,238)		Non-AUD (n=4,238)		p
Revision Arthroplasty	159	3.8%	80	1.9%	**<0.001**
Prosthetic Joint Infection	153	3.6%	71	1.7%	**<0.001**
Periprosthetic Fracture	111	2.6%	55	1.3%	**<0.001**
Periprosthetic Dislocation	119	2.8%	47	1.1%	**<0.001**
Acute Posthemorrhagic Anemia	524	12.4%	297	7.0%	**<0.001**
Blood Transfusion	124	2.9%	60	1.4%	**<0.001**
Acute Myocardial Infarction	72	1.7%	26	0.6%	**<0.001**
Pneumonia	152	3.6%	60	1.4%	**<0.001**
Pulmonary Embolism	67	1.6%	56	1.3%	0.318
Lower Extremity Deep Vein Thrombosis	132	3.1%	81	1.9%	**<0.001**
Acute Renal Failure	276	6.5%	113	2.7%	**<0.001**
Wound Dehiscence	66	1.6%	47	1.1%	0.072
Superficial Surgical Site Infection	24	0.6%	**	N/A	N/A
Deep Surgical Site Infection	12	0.3%	**	N/A	N/A

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Total Hip Arthroplasty Complications, Matched Cohorts

	24 Month Follow-Up				
	AUD (n=4,238)		Non-AUD (n=4,238)		p
Revision Arthroplasty	193	4.6%	97	2.3%	**<0.001**
Prosthetic Joint Infection	176	4.2%	82	1.9%	**<0.001**
Periprosthetic Fracture	148	3.5%	67	1.6%	**<0.001**
Periprosthetic Dislocation	146	3.4%	57	1.3%	**<0.001**
Acute Posthemorrhagic Anemia	613	14.5%	346	8.2%	**<0.001**
Blood Transfusion	150	3.5%	72	1.7%	**<0.001**
Acute Myocardial Infarction	121	2.9%	51	1.2%	**<0.001**
Pneumonia	250	5.9%	109	2.6%	**<0.001**
Pulmonary Embolism	87	2.1%	69	1.6%	0.146
Lower Extremity Deep Vein Thrombosis	167	3.9%	105	2.5%	**<0.001**
Acute Renal Failure	425	10.0%	167	3.9%	**<0.001**
Wound Dehiscence	88	2.1%	59	1.4%	0.016
Superficial Surgical Site Infection	31	0.7%	**	N/A	N/A
Deep Surgical Site Infection	17	0.4%	**	N/A	N/A

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