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The Association of Opioid Use Disorder on Postoperative Outcomes Following Lumbar Spine Laminectomy

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Introduction

The opioid epidemic in the United States continues to be a public health crisis, evident by an increase in misuse, overuse, and deaths related to opioid overdose [1]. Increased opioid prescriptions and use in chronic pain patients adds to this epidemic with 8 to 12% of these patients developing an opioid use disorder (OUD) [2,3]. Research focused on the association of OUD on postoperative outcomes in patients undergoing primary lumbar spine laminectomy is lacking. This study aims to observe the impact of OUD on 1) in-hospital length of stay (LOS), 2) readmission rates, 3) medical complications, and 4) healthcare expenditures.

Materials and Methods

This study was waived by our Institutional Review Board. A retrospective query was performed using a nationwide claims database from January 2005 to March 2014 for all patients who underwent lumbar laminectomy for decompression, yielding a total of 131,635 patients. The study cohort included 3,515 patients with an OUD while 128,120 patients served as the comparison cohort. Multivariate binomial logistic regression analyses were used to determine the association of OUD on readmission rates and medical complications whereas Welch's t- tests were used to compare LOS and healthcare expenditures. A p value < 0.001 was considered statistically significant.

Results/Case Report

Linear regression demonstrated the number of OUD patients undergoing lumbar spine laminectomy increased over 3-fold from 317 patients in 2005 to 1,091 patients by the end of the first quarter of 2014 ($p < 0.0001$). Patients with an OUD undergoing lumbar laminectomy had significantly longer in-hospital LOS (3.68 days vs. 1.13 days, $p < 0.0001$). Readmission rates were significantly higher (14.57% vs. 7.39%, OR: 1.73, $p < 0.0001$) in patients who had an OUD. The study cohort was found to have higher incidence and odds (32.36% vs. 9.76%, OR: 3.53, $p < 0.0001$) of ninety-day medical complications and total global ninety-day episode of care reimbursement rates (\$13,635.81 vs. \$8,131.20, $p < 0.0001$).

Discussion

This study demonstrates OUD to be associated with longer in-hospital LOS, increased rates of ninety-day readmissions, medical complications, and healthcare expenditures following lumbar spine laminectomy. Pain management specialists along with spine surgeons should seek to identify patients with an OUD and determine strategies to optimize patient care in the peri-operative course of lumbar surgery.

References

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Disclosures

No

Tables / Images

Demographics	Opioid Use Disorder		Comparison Cohort		p-value
	n	%	n	%	
Age (Years)					<0.0001
<64	1,977	56.24	14,522	11.33	
65 to 69	686	19.52	34,910	27.25	
70 to 74	409	11.64	32,494	25.36	
75 to 79	252	7.17	25,603	19.98	
80 to 84	138	3.93	14,680	11.46	
85<	53	1.51	5,911	4.61	
Sex					<0.0001
Female	2,011	57.21	62,253	48.59	
Male	1,504	42.79	65,867	51.41	
Comorbidities					
Alcohol Use Disorder	772	21.96	5,368	4.19	<0.0001
Arrhythmias	1,607	45.72	48,035	37.49	<0.0001
BMI 19 to 24 kg/m ²	128	3.64	2,023	1.58	<0.0001
BMI 25 to 29 kg/m ²	214	6.09	4,277	3.34	<0.0001
BMI 30 to 39 kg/m ²	614	17.47	12,646	9.87	<0.0001
BMI 40 to 70 kg/m ²	296	8.42	4,322	3.37	<0.0001
Congestive Heart Failure	1,081	30.75	27,085	21.14	<0.0001
Coagulopathy	668	19.00	16,026	12.51	<0.0001
Depressive Disorders	2,699	76.79	40,359	31.50	<0.0001
Diabetes Mellitus	1,729	49.19	52,110	40.67	<0.0001
Hypertension	3,172	90.24	114,339	89.24	0.001
Hypothyroidism	1,374	39.09	40,344	31.49	<0.0001
Iron Deficiency Anemia	2,184	62.13	54,887	42.84	<0.0001
Liver Failure	802	22.82	10,566	8.25	<0.0001
Neurological Deficits	869	24.72	17,268	13.48	<0.0001
Peptic Ulcer Disease	649	18.46	12,160	9.49	<0.0001
Peripheral Vascular Disease	1,455	41.39	46,191	36.05	<0.0001
Renal Failure	340	9.67	7,562	5.90	<0.0001
Rheumatoid Arthritis	1,466	41.71	26,868	20.97	<0.0001
Valvular Disorders	1,157	32.92	33,986	26.53	<0.0001
Pathologic Weight Loss	449	12.77	6,939	5.42	<0.0001
ECI	9		4		<0.0001

Table 1. Baseline Demographics of Opioid Use Disorder Patients and Comparison Cohort Undergoing Lumbar Spine Laminectomy. BMI = Body Mass Index; ECI = Elixhauser-Comorbidity Index

Medical Complications Assessed	OUD (%)	Control (%)	OR	95% CI	p-value*
Pneumoniae	6.29	1.23	5.23	3.57 – 5.99	<0.0001
Transfusion of Blood Products	0.54	0.15	5.12	2.92 – 8.48	<0.0001
Respiratory Failure	0.54	0.12	4.07	2.29 – 6.87	<0.0001
Urinary Tract Infection	14.54	4.49	3.57	3.19 – 3.97	<0.0001
Acute Kidney Injuries	4.84	1.36	3.31	2.75 – 3.95	<0.0001
Cerebrovascular Accidents	1.74	0.55	3.26	2.42 – 4.33	<0.0001
Deep Vein Thromboses	1.48	0.70	2.21	1.61 – 2.97	<0.0001
Myocardial Infarctions	0.77	0.30	2.20	1.40 – 3.32	<0.0001
Venous Thromboemboli	1.62	0.86	2.02	1.50 – 2.67	0.018
Total Medical Complications	32.36	9.76	3.53	3.23 – 3.85	<0.0001

Table 2. Comparison of Ninety-Day Medical Complications Between Opioid Use Disorder and Comparison Cohort Following Primary Lumbar Spine Laminectomy. OUD = Opioid Use Disorder; OR = Odds-Ratio; 95% CI = 95% Confidence Interval

* = Adjusted for Age, Sex, Geographic Region, Alcohol Use Disorder, Chronic Obstructive Pulmonary Disease, Diabetes Mellitus, General Anxiety Disorder, Hyperlipidemia, Hypertension, Obesity, and Tobacco Use

