Unicompartmental Knee Arthroplasty Patients with Preoperative Chronic Pain Diagnosis Have Comparable Healthcare Utilization to Non-Chronic Pain Patients

Shujaa T Khan[1], Ignacio Pasqualini, Yuxuan Jin, Lakshmi Spandana Gudapati, Alison K Klika[1], Michael R Bloomfield, Carlos A Higuera Rueda, Matthew Edward Deren[1], Nicolas Santiago Piuzzi
[1]Cleveland Clinic

INTRODUCTION:

One in four adults in the USA suffer from chronic pain – pain lasting longer than 3 months in one or more locations in your body. These patients can perceive pain differently and may not be satisfied with pain reliving surgeries like unicompartmental knee arthroplasty (UKA). This study aimed to evaluate (1) the prevalence of preoperative chronic pain diagnoses in UKA patients, and (2) healthcare utilization metrics such as length of stay (LOS), discharge disposition (DD), and 90-day readmissions in patients with and without a chronic pain diagnosis.

METHODS:

A cohort of 1,275 patients undergoing a UKA at a large tertiary academic center in the United States between 2016-2022 were included. Electronic medical record (EMR) was used to identify a preoperative diagnosis of chronic pain using ICD-9 (338.2 and 338.4) and ICD-10 (G89.2 and G89.4) coding. Summary statistics were obtained using medians and interquartile ranges for continuous variables and counts and percentages for categorical variables. Between group comparisons were made using Wilcoxon rank sum tests for continuous variables, and Chi-square or Fisher's exact tests for categorical variables. Multivariable proportional-odds regression model was used to compare LOS between those with psychiatric diagnosis versus those without. The model was controlled for pre-specified demographics and surgical confounding variables including location. Models for DD and Readmission were not built due to small number of events compared to degrees of freedom. All tests were two-sided, with a Type I error rate of 0.05. Cohort characteristics are displayed in **Table 1**.

RESULTS:

There were 234 patients out of 1,275 (18.4%) with a chronic pain diagnosis before their UKA. There was no significant difference in discharge to home/home healthcare between chronic pain and non-chronic pain patients (98.9% vs 99.6 %, p=0.706). Similarly, there was no statistically significant difference in 90-day readmissions between the two groups (3.3% vs 4.7%, p=0.38) **(Table 2)**. After adjusting for possible confounding variables, patients with a preoperative chronic pain diagnosis were not associated with a prolonged LOS (odds ratio [OR] 1.38 (0.75, 2.55); p=0.298) **(Table 3).**

DISCUSSION AND CONCLUSION:

Nearly one in five patients undergoing UKA have a preoperative chronic pain diagnosis. Patients with a chronic pain diagnosis before UKA have comparable postoperative healthcare utilization to those without. Based on these results, UKA should be equally accessible in patients with chronic pain conditions as they show equivalent improvements. Further larger scale studies are required to assess the impact on clinical outcomes.

Table 1 - Cohort demographics

Variable	Level	Total (N=1275)	No Chronic Pain (N=1041)	Chronic Pain (N=234)	P-value
Age		66.0 [58.0;72.0]	66.0 [58.0;73.0]	64.5 [57.0;72.0]	0.183
Sex	Male	600 (47.1%)	508 (48.8%)	92 (39.3%)	0.011
	Female	675 (52.9%)	533 (51.2%)	142 (60.7%)	
BMI		29.0 [25.8;32.8]	29.0 [25.8;32.6]	29.0 [25.4;33.1]	0.962
Race	White	1112 (89.5%)	917 (90.3%)	195 (85.9%)	0.151
	Black	43 (3.46%)	32 (3.15%)	11 (4.85%)	
	Other	88 (7.08%)	67 (6.59%)	21 (9.25%)	
Education		14.0 [12.0;16.0]	14.0 [12.0;16.0]	14.0 [12.0;16.0]	0.963
Smoking	Never	755 (59.2%)	620 (59.6%)	135 (57.7%)	0.009
	Quit 6m+	414 (32.5%)	345 (33.1%)	69 (29.5%)	
	Quit <6m	30 (2.35%)	25 (2.40%)	5 (2.14%)	
	Current	76 (5.96%)	51 (4.90%)	25 (10.7%)	
ADI		47.0 [27.0;67.0]	44.0 [26.0;65.0]	57.5 [34.0;74.8]	<0.001
CCI		0.00 [0.00;1.00]	0.00 [0.00;1.00]	0.00 [0.00;2.00]	0.004
Insurance	Private	479 (42.2%)	386 (42.3%)	93 (41.9%)	0.041
	Medicaid	45 (3.97%)	31 (3.40%)	14 (6.31%)	
	Medicare	588 (51.9%)	481 (52.7%)	107 (48.2%)	
	Other	22 (1.94%)	14 (1.54%)	8 (3.60%)	
PROM Phenotype	Pain+ PS+ MCS+	412 (32.3%)	340 (32.7%)	72 (30.8%)	0.409
	Pain+ PS+ MCS-	211 (16.6%)	173 (16.6%)	38 (16.2%)	
	Pain+ PS- MCS+	122 (9.58%)	106 (10.2%)	16 (6.84%)	
	Pain+ PS- MCS-	101 (7.93%)	81 (7.79%)	20 (8.55%)	
	Pain- PS+ MCS+	29 (2.28%)	22 (2.12%)	7 (2.99%)	
	Pain- PS+ MCS-	33 (2.59%)	26 (2.50%)	7 (2.99%)	
	Pain- PS- MCS+	134 (10.5%)	113 (10.9%)	21 (8.97%)	
	Pain- PS- MCS-	232 (18.2%)	179 (17.2%)	53 (22.6%)	
Diagnosis	OA	1252 (98.2%)	1023 (98.3%)	229 (97.9%)	0.595
	non-OA	23 (1.80%)	18 (1.73%)	5 (2.14%)	
Anesthesia	General	524 (41.1%)	458 (44.0%)	66 (28.2%)	<0.001
	Spinal	692 (54.3%)	537 (51.6%)	155 (66.2%)	
	Other	58 (4.55%)	45 (4.33%)	13 (5.56%)	
Narx		110 [0.00;190]	110 [0.00;190]	110 [0.00;200]	0.189

Table 2 – Summary statistics of healthcare utilization

Variable	Level	Total (N=1275)	No Chronic Pain (N=1041)	Chronic Pain (N=234)	P-value
LOS	>=2 days	79 (6.20%)	59 (5.67%)	20 (8.55%)	0.133
DD	Home/HHC	1263 (99.1%)	1030 (98.9%)	233 (99.6%)	0.706
	Other	12 (0.94%)	11 (1.06%)	1 (0.43%)	
90-day Readmission	Yes	45 (3.53%)	34 (3.27%)	11 (4.70%)	0.380

LOS: length of stay, DD: discharge disposition, HHC: home health care

Table 5 Multivariable logistic regression model results, using **LOS** as outcome. Please note that LOS>=2 were defined as "events." Chronic Pain is not associated with LOS.

Factor	Level	OR (95%CI)	Pvalue	Overall Pvalue
Group	Chronic Pain (v no Chronic Pain)	1.38 (0.75, 2.55)	0.298	0.298