

Parkinson's Disease as a Risk Factor for Inpatient Postoperative Complications after Total Knee Arthroplasty

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INTRODUCTION:

Parkinson's Disease is a well-established risk factor for a multitude of adverse outcomes in total knee arthroplasty (TKA). However, the effects of Parkinson's Disease on patient outcomes have yet to be fully examined. The objective of this study was to compare inpatient rates of perioperative complications and resource utilization between patients with and without prediabetes undergoing primary, elective TKA.

METHODS: A retrospective cohort study was performed using a large national, administrative database from 2016 to 2021. 83,380 patients with Parkinson's Disease undergoing primary, unilateral, elective TKA from January 1, 2016, to December 31, 2021 were identified. Patients with Parkinson's Disease were matched 1:1 using age, sex, race, ethnicity, insurance, modified Elixhauser Comorbidity Index, and smoking to patients without Parkinson's Disease. Cohorts consisted of 60,610 Parkinson's Disease patients matched 1:1 with patients without Parkinson's Disease.

RESULTS:

For patients undergoing TKA, having Parkinson's Disease was associated with significantly higher rates of myocardial infarction (OR 2.2), arrhythmias (OR 1.1), respiratory failure (OR 1.2), postoperative intestinal obstruction (OR 1.3), postoperative blood transfusion (OR 1.3), postoperative bleeding (OR 1.8), hypotension (OR 1.3), pulmonary embolism (OR 1.9), and, particularly, postoperative periprosthetic fracture (OR 4.0) compared to patients without Parkinson's Disease (all p<0.01). Parkinson's Disease was also associated with a significantly increased patient length of stay in the hospital (2.09 vs. 2.07 days, p=0.01) and a decreased percentage of home discharge (82.1 vs. 82.8%, p<0.01).

DISCUSSION AND CONCLUSION: After TKA, patients with Parkinson's Disease were associated with higher rates of perioperative complications, particularly postoperative periprosthetic fracture, increased length of stay, and decreased discharges to home compared to patients without Parkinson's Disease.

Table 1. Risk of postoperative complications for Parkinson patients compared to controls in patient after total knee arthroplasty.

Complication	Controls n(n)	Parkinson n(n)	OR (95% CI)	P value
Myocardial Infarction	55 (0.1)	125 (0.2)	2.2 (1.36 – 3.1)	<0.01
Arrhythmias	7,720 (12.7)	8,570 (14.1)	1.1 (1.0 – 1.1)	<0.01
Pneumonia	120 (0.2)	120 (0.2)	1.0 (0.7 – 1.2)	1
Respiratory failure	300 (0.5)	370 (0.6)	1.2 (1.0 – 1.4)	<0.01
Atelectasis	395 (0.7)	405 (0.7)	1.0 (0.8 – 1.1)	0.75
Postoperative UTI	445 (0.7)	460 (0.8)	1.0 (0.9 – 1.1)	0.64
Postoperative Urinary Retention	1,890 (3.1)	1,945 (3.2)	1.0 (0.9 – 1.0)	0.37
Postoperative Intestinal Obstruction	140 (0.2)	195 (0.3)	1.3 (1.1 – 1.7)	<0.01
Postoperative Anemia	8,210 (13.5)	8,375 (13.8)	1.0 (0.9 – 1.0)	0.17
Postoperative Blood Transfusion	480 (0.8)	635 (1.0)	1.3 (1.1 – 1.4)	<0.01
Postoperative Bleeding	40 (0.1)	75 (0.1)	1.8 (1.2 – 2.7)	<0.01
Hypotension	1,465 (2.4)	1,940 (3.2)	1.3 (1.2 – 1.4)	<0.01
DVT	115 (0.2)	105 (0.2)	0.9 (0.7 – 1.1)	0.50
Pulmonary Embolism	80 (0.1)	155 (0.3)	1.9 (1.4 – 2.5)	<0.01
Hematoma/Seroma	340 (0.6)	340 (0.6)	1.0 (0.58 – 1.1)	1
Wound Dehiscence	20 (0.03)	15 (0.02)	0.6 (0.3 – 1.1)	0.40
Postoperative Periprosthetic Fracture	<11 (0.01)	20 (0.03)	4.0 (1.5 – 10.6)	<0.01

OR: Odds ratio
CI: Confidence interval

Table 2. Mean and relative cost associated with Parkinson compared to controls in patients undergoing total knee arthroplasty surgery.

Resource	Controls n=34,810	Parkinson Patients n=34,810	P value
	Mean/Median (Range)	Mean/Median (Range)	
Total Cost (US\$)	12,628 ± 7,765	12,448 ± 7,587	<0.01
Length of Stay (days)	2.07 ± 1.15	2.09 ± 1.20	0.01
Disposition	n (%)		
Home	82.8 (50,170)	82.1 (49,760)	<0.01

Median was used for total costs.

Total costs were adjusted for inflation to 2021 US dollars.