

Assessing General vs. Spinal Anesthesia as a Risk Factor for 90-Day Emergency Department Visits Status-Post Index Total Knee Arthroplasty: A Retrospective Case Control Study

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INTRODUCTION: As bundle payment care initiatives become ever prevalent in total knee arthroplasty (TKA), institutions have increasingly focused on cost-saving measures which maintain or improve upon the standard of care. One area of interest is identifying potential modifiable and non-modifiable risk factors. Here we evaluate the correlations of general versus spinal anesthesia in TKAs in perioperative outcomes.

METHODS: All primary TKAs between 7/1/2013 to 12/31/2017 were obtained retrospectively from a prospective institutional database utilized for contribution to a state-wide joint arthroplasty database. Prospective data includes baseline demographics, select medical comorbidities, intraoperative variables and postoperative course/complications. Patients were separated into two cohorts based on anesthetic type: general or spinal anesthesia. Patients receiving both or neither anesthetic were excluded from the study. Cohorts were compared utilizing Student's unpaired t-test for continuous variables and χ^2 test for categorical variables. $p < .05$ was deemed statistically significant.

RESULTS:

In total, 8,339 patients were included in the study. 2947 (35.34%) TKAs received exclusively general while 5,392 (64.66%) received spinal anesthesia, exclusively.

Patient receiving general anesthetic were noted to be significantly younger (65.54 ± 9.81 vs 66.97 ± 9.55 ; $p < 0.0001$), higher BMI (33.15 ± 6.94 vs 31.06 ± 6.09 kg/m²; $p < 0.0001$), higher ASA (ASA 3/4: 58.60% vs 38.17%; $p < 0.0001$), active smokers (9.16% vs 5.59%; $p < 0.0001$), diabetic (21.75% vs 15.88%; $p < 0.0001$), and had had a history of a DVT (11.37% vs 6.66%; $p < 0.0001$). Intraoperatively, these patients less frequently received intraoperative tranexamic acid (79.23% vs 87.14%; $p < 0.0001$) and had longer surgical times (1.68 ± 0.75 vs 1.34 ± 0.38 hours; $p < 0.0001$). Post-operatively, TKAs undergoing general anesthesia had a longer length of stay (2.81 ± 1.54 vs 2.43 ± 1.33 ; $p < 0.0001$), less likely to be discharged home (67.63% vs 75.63%; $p < 0.0001$), received a blood transfusion (7.60% vs 3.26%; $p < 0.0001$), and had a post-operative DVT (2.04% vs 1.15%; $p < 0.01$). Lastly, TKAs receiving general anesthesia were more likely to present to the ED within 90 days than spinal anesthesia TKAs (9.87% vs 7.05%; $p < 0.0001$).

DISCUSSION AND CONCLUSION: Receiving general anesthesia is correlated with suboptimal postoperative outcomes such as increased discharge to a facility and more frequent 90-day ED visits. While this relationship is unlikely causal, patients receiving general anesthetic are likely more comorbid and may require more closely monitored perioperative care.

Data Values Analyzed	General n=2947	Spinal n=5392	p-Value
Age	65.54±9.81	66.97±9.55	<.0001
Gender			0.98
Female	1889 (64.1%)	3459 (64.15%)	
Male	1058 (35.90%)	1933 (35.85%)	
BMI (kg/m ²)	33.15±6.94	31.06±6.09	<.0001
ASA Score			<.0001
1	15 (0.51%)	46 (0.85%)	
2	1204 (40.86%)	3291 (61.03%)	
3	1632 (55.38%)	2025 (37.65%)	
4	95 (3.22%)	28 (0.52%)	
Unknown	1 (0.03%)	2 (0.04%)	
Diabetic			<.0001
Yes	641 (21.75%)	856 (15.88%)	
No	2305 (78.22%)	4531 (84.05%)	
Unknown	1 (0.03%)	4 (0.07%)	
Smoking			<.0001
Current	270 (9.16%)	316 (5.59%)	
Former	1541 (52.29%)	3054 (56.82%)	
Previous	1125 (38.17%)	1995 (37.00%)	
Unknown	11 (0.37%)	17 (0.32%)	
History of DVT Preoperatively			<.0001
Yes	335 (11.37%)	359 (6.66%)	
No	2609 (88.53%)	5032 (93.32%)	
Unknown	3 (0.10%)	1 (0.02%)	
Intraoperative Tranexamic Acid	2335 (79.23%)	4713 (87.41%)	<.0001
Surgical Time (Hours)	1.68±0.75	1.34±0.38	<.0001
Length of stay	2.81±1.54	2.43±1.33	<.0001
Received Transfusion	224 (7.60%)	176 (3.26%)	<.0001
Discharge			<.0001
Home with self-care	83 (2.82%)	135 (2.50%)	
Home with services	1910 (64.81%)	3943 (73.13%)	
Subacute nursing facility	752 (25.52%)	1023 (18.97%)	
Inpatient Rehabilitation	197 (6.68%)	289 (5.36%)	
Short term hospital facility	4 (0.14%)	0	
Hospice	1 (0.03%)	2 (0.04%)	
ED 90-Day Visit	2919 (9.87%)	380 (7.05%)	<.0001
Postoperative DVT	60 (2.04%)	62 (1.15%)	<.01