



Introduction

Perioperative atrial Fibrillation (aFib) has been associated with increased morbidity, mortality, length of stay and cost of hospitalization¹⁻³. However, there is a paucity of data detailing risk factors for aFib after non-cardiac and thoracic surgery. Therefore, we aimed to identify predictors and influencing factors for aFib in patients undergoing total knee arthroplasty.

Methods

After approval from the Institutional Review Board we retrospectively analyzed data from patients undergoing total knee arthroplasty at the Hospital for Special Surgery from 2005 to 2014. Variables examined as potentially influencing the odds for developing aFib in multivariate logistic regression models included age, gender, anesthesia type, and comorbidities.

Variable	Atrial fibrillation (n = 1463)	No atrial fibrillation (n = 19742)	p value
Age *	73.46 (73.05, 73.87)	66.61 (66.47, 66.76)	<0.0001
Female gender	696 (47.57)	12490 (63.27)	<0.0001
Comorbidities			
Hypothyroidism	200 (13.67)	2837 (14.37)	0.4848
Renal	86 (5.88)	490 (2.48)	<0.0001
Diabetes	29 (1.98)	197 (0.998)	0.0007
Obesity	384 (26.25)	5784 (29.30)	0.0143
Sleep apnea	188 (12.85)	1769 (8.96)	<0.0001
Valvular disease	121 (8.27)	607 (3.08)	<0.0001
Hypertension	1002 (68.49)	10981 (55.62)	<0.0001
Congestive heart failure	71 (4.85)	208 (1.05)	<0.0001
Tobacco abuse	373 (25.50)	4666 (23.64)	0.1138
Pulmonary	190 (12.99)	2104 (10.66)	0.0064
Depression/anxiety	27 (1.85)	641 (3.25)	0.0039
Psychoses	24 (1.64)	234 (1.19)	0.1589

Data is presented as n (%) unless noted otherwise.

* mean (95% C.I.)

Results

Of N = 21,205 patients n = 1463 (6.8 %) developed aFib. Demographic data and row numbers are presented in Table 1. Older age and male gender as well as preexisting psychosis, sleep apnea, hypertension, congestive heart failure or valvular disease were significantly associated with the development of postoperative aFib as shown in Table 2. Patients with preexisting depression or anxiety had decreased odds (OR 0.67, CI 0.45 – 0.99) for developing aFib. When compared to general anesthesia patients under combined spinal epidural (OR 0.65, CI 0.48 – 0.88) and under epidural anesthesia (OR 0.52, CI 0.32 – 0.85) had significantly decreased odds for developing aFib. Spinal anesthesia alone was not associated with significantly reduced odds for aFib.

Variable	Reference	OR	95% CI	p < 0.05
Age	minus one year	1.08	1.07 - 1.08	*
Female	Male	0.51	0.45 - 0.57	*
Type of Anesthesia				
CSE	General Anesthesia	0.65	0.48 - 0.88	*
Epidural	General Anesthesia	0.52	0.32 - 0.85	*
Spinal	General Anesthesia	0.74	0.53 - 1.04	
Comorbidities				
Hypothyroidism	No Hypothyroidism	0.99	0.85 - 1.18	
Renal	No Renal	1.24	0.97 - 1.60	
Diabetes	No Diabetes	1.51	0.99 - 2.29	
Obesity	No Obesity	1.04	0.92 - 1.19	
Sleep apnea	No Sleep apnea	1.52	1.28 - 1.81	*
Valvular Disease	No Valvular Disease	1.61	1.30 - 1.99	*
Hypertension	No Hypertension	1.25	1.10 - 1.40	*
Congestive Heart Failure	No Congestive Heart Failure	2.92	2.17 - 3.92	*
Tobacco abuse	No Tobacco abuse	0.99	0.88 - 1.13	
Pulmonary	No Pulmonary	1.33	1.12 - 1.57	
Depression/Anxiety	No Depression/Anxiety	0.67	0.45 - 0.99	*
Psychoses	No Psychoses	1.86	1.19 - 2.90	*

Discussion

Atrial fibrillation is a relatively common perioperative complication among patients undergoing total knee arthroplasty. Age, gender, type of anesthesia, cardiopulmonary and psychiatric comorbidities seem to be predicting factors. Specifically, neuraxial anesthesia seems to be associated with a significantly reduced risk for developing aFib among patients undergoing total knee arthroplasty. While other factors can only be used as predictors, the decision to use neuraxial anesthesia instead of general anesthesia might have a relevant beneficial impact on patient outcomes. As this study is ongoing we plan to introduce additional potentially relevant factors such as the use of medications into the model.

References

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