



Risk Factors for Hospital-Acquired Conditions (HAC) and Associated Complications Following Anterior Cervical Discectomy and Fusion (ACDF)

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Introduction

Considerable controversy has surfaced regarding patients' developing a hospital-acquired condition (HAC) postoperatively and they are associated with inferior patient outcomes. The three most common conditions are surgical site infections (SSI), deep vein thromboembolism (VTE), and urinary tract infections (UTI). The most common surgical procedure of the cervical spine is ACDF and consistent risk factors for these postoperative events have not been identified utilizing a large database.

Methods

This was a retrospective analysis of prospectively collected data from the NSQIP database of patients > 18 years old undergoing elective ACDF between 2005 and 2012. Patient baseline factors, perioperative data, preoperative labs, and postoperative course were recorded. Patients with SSI, VTE, or UTI were compared using multivariate logistic regression analysis with significance defined as $p < 0.05$. Odds ratio (OR) was calculated with a 95% confidence interval.

Results

3,845 patients met inclusion criteria with 50.3% of patients male and 80.5% performed as inpatient procedures. Overall rate of HAC was 1.7% (66/3845). Regression analysis showed independent predictors of HAC's were American Society of Anesthesiologists (ASA) score ≥ 3 (OR 1.9, 1.2-3.2), history of stroke (OR 3.1, 1.2-8.5) and operative time > 4 hours (OR 2.8, 1.4-5.5). BMI, diabetes, smoking, prior functional status, other comorbidities, and multilevel fusions were not significant for developing HAC's ($p > 0.05$). Patients with HAC had a higher rate of mortality (0.2% vs 1.5%, $p=0.04$), reoperation (1.5% vs 21.2%, $p<0.0001$), longer length of stay (LOS) > 5 days (5.4% vs 28.8%, $p<0.0001$) and readmission (1.2% vs 10.6%, $p<0.0001$).

Conclusions

Risk factors for the development of a HAC's following ACDF were higher ASA scores, history of stroke and prolonged operative time. Developing a HAC was associated with higher rates of mortality, reoperation and readmission. This demonstrates a combination of perioperative variables that need careful consideration during surgical planning and medical optimization.

Learning Objectives

By the conclusion of this session, participants should be able to understand risk factors for HAC in patients undergoing ACDF.

Impact of Hospital Acquired Condition (SSI, UTI, VTE) on Early Postoperative Complications

Impact of Hospital Acquired Condition (SSI, UTI, VTE) on Early Postoperative Complications							
	Total		No HAC		HAC		P value
	3845		3779		66		
	N	%	N	%	N	%	
Any Complication	125	3.25%	59	1.56%	66	100.00%	<0.0001
Major Complication	87	2.26%	58	1.53%	29	43.94%	<0.0001
Death	10	0.26%	9	0.24%	1	1.52%	0.043
Pulmonary Complication	54	1.40%	39	1.03%	15	22.73%	<0.0001
Renal Complication	2	0.05%	2	0.05%	0	0.00%	0.852
CNS Complication	6	0.16%	6	0.16%	0	0.00%	0.746
Peripheral Vascular Disease	5	0.13%	4	0.11%	1	1.52%	0.002
Cardiac Complication	9	0.23%	8	0.21%	1	1.52%	0.03
Intra/postoperative Blood Transfusion	18	0.47%	17	0.45%	1	1.52%	0.209
Return to OR	72	1.87%	58	1.53%	14	21.21%	<0.0001
Unplanned Readmission (2011-2012)	54	1.40%	47	1.24%	7	10.61%	<0.0001
Operative Time > 4 hours	252	6.55%	241	6.38%	11	16.67%	0.001

Multivariate Logistic Regression to Assess Independent Risk Factors for HAC

Multivariate Logistic Regression to Assess Independent Risk Factors for HAC				
Risk Factors	Adjusted OR	95 CI		P Value
ASA ≥ 3	1.93	1.167	3.193	0.01
History of Stroke/Cerebrovascular Accident	3.145	1.199	8.248	0.02
Operative Time > 4 hours	2.804	1.44	5.459	0.002