

Predictive Factors of Ventilator Dependency following Colon and Rectal Surgery

Zhobin Moghadamyeghaneh MD, Steven D. Mills MD, Joseph C. Carmichael MD, Roy M. Fujitani MD, Alessio Pigazzi MD, Michael J. Stamos MD



Department of Surgery, University of California Irvine School of Medicine, Orange, California

INTRODUCTION

Postoperative ventilator dependency is one of the most important surgical complications, and is associated with higher cost of treatment, longer hospital stay, and increased morbidity and mortality of patients. It is important to recognize risk factors prior to operation. We sought to identify incidence rate, risk factors, and outcomes of ventilator dependency in colorectal surgery.

METHODS

- A retrospective review of the NSQIP database was performed for patients undergoing colorectal resection between Jan. 2005 and Dec. 2012
- 32 perioperative factors were examined
- Multivariate regression analysis were used to identify predictors of ventilator dependency (more than 48 hours)

RESULTS

- A total of 151,275 patients were identified, 4.2% of patients had complication of ventilator dependency
- Among patients with ventilator dependency, 48.6% remained intubated after the procedure, the remainder were reintubated
- 19 perioperative factors have associations with ventilator dependency

Perioperative variables associated with postoperative ventilator dependency in colon and rectal surgery patients

Patient-specific factors		P-value	Adjusted Odds Ratio	95% Confidence Interval
Gender	Female		References	
	Male	<0.01	1.26	1.12-1.42
Age	Age ≤ 75		Feferences	
	Age ≥ 75	<0.01	1.34	1.16-1.54
Admission Type	Non-emergent		References	
	Emergency	<0.01	2.99	2.60-3.45
Surgical Fechnique	Laparoscopic		References	
	Open	<0.01	1.81	1.53-2.14
Pathology	Non-malignant		References	
	Malignant	<0.01	0.75	0.65-0.87
omorbidity	ASA Score More than Two	0.01	2.63	1.24-5.59
	Body Mass Index >30	<0.01	1.23	1.08-1.39
	Smoke	<0.01	1.34	1.16-1.54
	Diabetes Mellitus	<0.01	1.22	1.05-1.43
	Dyspnea	<0.01	1.51	1.29-1.76
	Preoperative Myocardial Infarction	<0.01	2.19	1.35-3.53
	Dependency before Surgery	<0.01	2.60	2.24-3.01
	Ascites	<0.01	1.64	1.25-2.16
	Hypertension	<0.01	1.45	1.27-1.65
	Chronic Obstructive Pulmonary Disease	<0.01	1.73	1.43-2.08
	Alcohol Abuse	<0.01	1.91	1.52-2.42
Other Factors	Preoperative Leukocytosis	0.01	1.17	1.03-1.34
	Hypoalbuminemia	<0.01	1.53	1.34-1.75
	Intraoperative Transfusion	<0.01	2.78	2.39-3.25
	Anesthesia length more than Two Hours	<0.01	1.75	1.39-2.20

RESULTS (CONTINUED)

- Patients who had complication of ventilator dependency were older, had higher ASA score and had higher rate of preoperative hypoalbuminemia
- The unadjusted mortality rate in patients with and without ventilator dependency was 28.3% and 2.2%, respectively; while the adjusted risk of mortality in patients with ventilator dependency was eight times more than patients without (AOR: 8.11, P<0.01)</p>
- Patients with ventilator dependency had higher rates of sepsis (AOR: 5.14, P<0.01) and acute renal failure (AOR: 16.9, P<0.01).

CONCLUSION

- Postoperative ventilator dependency occurs in 4.2% of colorectal resections. However, patients with post-operative ventilator dependency are eight times more likely to die.
- There is an increased risk of ventilator dependency in the presence of preoperative hypoalbuminemia and leukocytosis.
- Emergency admission and need for transfusion during operation are respectively the strongest predictors of postoperative ventilator dependency.