

Introduction

Delirium is increasingly being recognized as a major complication following surgery and has significant impact on recovery and postoperative morbidity. While prior studies have examined delirium rates in the medical or surgical ICU, there are limited reports looking at delirium specifically within neurosurgical patients. We examined the prevalence of delirium, associated risk factors, and associated outcomes in patients undergoing a cranial neurosurgical procedure.

Methods

235 consecutive adult patients who underwent a cranial surgery were retrospectively analyzed. As part of routine clinical care, delirium screening was performed during each patient’s hospital course using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) or Nursing Delirium Screening Scale (NuDESC) questionnaires. Patient, treatment, and outcome characteristics were determined from clinical reports available through the electronic medical record.

Results

52 patients (22.1%) within the cohort screened positive for delirium at least once during their hospital stay. On bivariate analysis, patient characteristics associated with delirium included older age, race/ethnicity (African American and Asian), pathologic diagnosis (hydrocephalus, infection, and vascular lesions), and admission as a transfer or through the emergency room. Hospitalization characteristics associated with delirium included longer ICU length of stay, abnormal sodium, a postoperative infection, and a new neurological deficit postoperatively. On multivariate logistic regression analysis, older age, longer length of ICU stay, and the presence of a

Table 1. Patient characteristics associated with delirium			
	Delirium Positive	Delirium Negative	p-value
Number of Patients	52 (22.13%)	183 (77.87%)	
Sex			0.6755
Male	27 (51.92%)	89 (48.6%)	
Female	25 (48.02%)	94 (51.4%)	
Age	57.96 ± 2.06	51.1 ± 1.1	0.0038
BMI	26.98 ± 0.89	27.88 ± 0.47	0.3503
Race			0.0035
African American	5 (9.62%)	4 (2.19%)	
Asia	11 (21.15%)	14 (7.65%)	
Caucasian	28 (53.85%)	114 (62.3%)	
Hispanic	6 (11.54%)	39 (21.31%)	
Hawaiian/Pacific Islander	0 (0%)	2 (1.09%)	
Unknown	2 (3.85%)	10 (5.46%)	
Category			<0.0001
Tumor	19 (36.54%)	98 (53.85%)	
Vascular	15 (28.85%)	41 (22.53%)	
Hydrocephalus	12 (23.08%)	11 (6.04%)	
Infection	4 (7.69%)	1 (0.55%)	
Epilepsy	0 (0%)	7 (3.85%)	
Movement Disorder	0 (0%)	11 (6.04%)	
Other	2 (3.85%)	13 (7.14%)	
Location of Pathology			0.4412
Supratentorial	46 (88.46%)	154 (84.15%)	
Infratentorial	6 (11.54%)	29 (15.85%)	
Prior Cranial Procedure	21 (40.38%)	54 (29.51%)	0.1376
Transfer or ED Admission	37 (71.15%)	43 (23.50%)	< 0.0001
Diabetes	11 (21.15%)	21 (11.54%)	0.0751
Prior-to-Admission Medications	4.6 ± 0.52	4.0 ± 0.26	0.3029

Table 2. Hospitalization and surgery characteristics associated with delirium			
	Delirium Positive	Delirium Negative	p-value
Length of ICU Stay (d)	9.0 ± 0.71	1.6 ± 0.38	< 0.0001
% ICU Stay	47.2 ± 4.5 %	33.9 ± 2.4 %	0.0102
Length of Surgery (min)	226.0 ± 16.4	269.3 ± 8.7	0.0205
EBL (mL)	192.2 ± 51.17	159.2 ± 27.09	0.5801
Steroid Use	30 (57.69%)	151 (82.51%)	0.0002
Benzodiazepine Use	20 (38.46%)	52 (28.42%)	0.1655
Abnormal Sodium	31 (62%)	40 (21.98%)	<0.0001
Post-operative Infection	8 (18.6%)	4 (2.19%)	<0.0001
Any Neuro-deficit	39 (75%)	56 (30.6%)	<0.0001
New/Worsened Post-operative Neuro deficit	14 (26.92%)	23 (12.64%)	0.0071
Awake Craniotomy	15 (8.20%)	1 (1.92%)	0.1130

Table 3. Outcomes			
	Delirium Positive	Delirium Negative	p-value
Length of Admission (d)	16.25 ± 0.97	4.36 ± 0.52	<0.0001
Disposition Home	17 (32.69%)	164 (89.62%)	<0.0001
30-day Unexpected Readmission	7 (13.46%)	13 (7.10%)	0.1471

Conclusions

Delirium is prevalent in patients requiring neurosurgery and is associated with several patient and hospitalization characteristics. These results may help identify patients on a neurosurgical service who are at-risk for delirium in order to enact delirium precautions and interventions pre-emptively.

Learning Objectives

- 1.Describe the prevalence of delirium in a general neurosurgical patient cohort
- 2.Highlight associated patient and hospitalization factors that are associated with delirium
- 3.Highlight outcomes associated with the occurrence of delirium while hospitalized