Predictors of Inpatient Complications and Outcomes Following Surgical Resection of Hypothalamic Hamartomas

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Introduction

We aimed to determine pre-operative factors associated with greater risk of inpatient complication and poor outcomes in a national population of patients undergoing surgical resection of hypothalamic hamartomas.

Methods

We performed a multi-institutional retrospective cohort analysis via the Nationwide Inpatient Sample (1998-2007). Patients of any age who underwent resection of hypothalamic hamartomas were identified by ICD-9 coding. Primary outcomes included inpatient complications, length of stay (LOS), and total hospital charges. Multivariate logistic and linear regression models were constructed to analyze binary and continuous outcomes, respectively.

Table 1

Patient Demographics	N	%
Age, in years		
Mean (SE)	27.7 (2.7)	
Median	23.2	
Male	150	53.2
Race		
Caucasian	167	78.9
African-American	15	7.0
Hispanic	14	6.4
Asian / Pacific Islander	<10	-
Other	12	5.5
Primary Payer		
Medicare	15	5.3
Medicaid	55	19.4
Private Insurance	196	69.3
Self-pay	17	6
Academic Hospital Admission	259	91.7
Elective Procedure	178	74.7
Elixhauser Index Score		
0	100	35.6
1	132	46.6
2	40	14.1
3	<10	1.7
4	<10	1.9

Results

282 patients were identified, with a mean age of 27.7 years old and a majority male 53.2%), Caucasian (78.9%), with private insurance (69.3%), and treated electively (74.7%) at academic centers (91.7%). A majority of patients (82.2%) had an Elixhauser comorbidity score of 1 or less, indicating relatively few comorbidities.

No inpatient deaths were reported. Mean length of stay was 7.39 days, associated with mean total hospital charges of $53,935. Overall, 19.5% of patients developed an inpatient complication including primarily stroke (16.7%).

Female gender, ethnic/racial minorities, higher comorbidity score, private insurance, and non-academic hospital status were associated with both greater length of stay and total charges. Private insurance (Odds Ratio, OR: 1.59, p=0.045) and academic hospital status (OR: 1.43, p=0.008) were associated with significantly higher odds of any inpatient complication. Post-operative stroke was significantly more likely to occur in minority race/ethnicity patients (OR: 1.02, p<0.001) relative to Caucasians.

Table 2

Number of Cases by years, N (%)	
1998 – 1999	74
2000 – 2001	72
2002 – 2003	55
2004 – 2005	53
2006 – 2007	28
Total number of cases, N	282
Outcomes	
Mean length of stay, in days (SE)	7.39 (0.86)
In-hospital mortality, %	0
Mean total charges, in US dollars* (SE)	$53, 935 ($7,024)
Patients with complications, %	19.5
Stroke	16.7
Fluid / electroltye abnormalities	8.9
Central Diabetes Insipidus	7.1
Thromboembolic Complications	1.1
CSF leak	0.0
Iatrogenic panhypopituitarysm	0.0

Table 3

Outcome / Risk Factor	RR / OR	*P*-value
Increased Length of Stay		
Each one point increase in Charlson score	7.22 days	< 0.001
Minority race / ethnicity	3.93 days	< 0.001
Female sex	3.49 days	< 0.001
Private insurance	2.24 days	< 0.001
Non-academic hospital status	4.18 days	< 0.001
Increased Total Charges		
Each one point increase in Charlson score	$57,915	< 0.001
Minority race / ethnicity	$82,703	< 0.001
Younger patient age	$8,695	< 0.001
Female sex	$34,879	< 0.001
Private insurance	$54,007	< 0.001
Non-academic hospital status	$16,000	< 0.001
Increased Overall Complications		
Private insurance	1.59	0.045
Academic hospital status	1.43	0.008

RR: Relative risk, OR: odds ratio

Conclusions

Through the analysis of a national database, we have demonstrated the relatively safety of the surgical resection of hypothalamic hamartomas. Over 10 years, these operations have been undertaken with a very low mortality rates, but a significant rate of inpatient morbidity, particularly post-operative stroke, may be predicted by several pre-operative factors including patient gender and race/ethnicity.

Learning Objectives

1. To identify the major inpatient complications and outcomes of patients undergoing surgical resection of hypothalamic hamartomas nationwide.

2. To identify risk factors associated with poor surgical outcomes within this patient population.

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