Trends in Intracranial Meningioma Surgery and Outcome: A Nationwide Inpatient Sample Database Analysis from 2001 to 2010

Sudheer Ambekar; Anil Nanda MD FACS

Mayur Sharma MD, Venkatesh Madhugiri MD

Louisiana State University Health Sciences Center, Shreveport, LA

Introduction

The treatment paradigms for intracranial meningiomas have been constantly evolving. It is now generally accepted that such benefits may, by and large, be negligible when compared with less aggressive multi-modality approaches. In this analysis, we analyze the trends in practice patterns and the outcome of craniotomy for intracranial meningioma in the US between 2001 and 2010.

Methods

We performed a retrospective cohort study using the Nationwide Inpatient Sample database for the years 2001 through 2010. In-patient mortality and adverse outcome at discharge were the outcome predictors.

Results

The annual case-volume of patients with meningioma increased from 2001 to 2010 by 40%. The in-patient mortality rate remained the same at 1.3% and the rate of adverse discharge disposition remained at 35% between 2001 and 2010 despite minor variations within the decade. Morbidity and mortality were significantly higher in patients with co-morbidities. Caucasian female patients in younger age group with private insurance and treated at a high case volume center had the best outcomes. In elderly patients (= 70 years), the in-patient mortality rate decreased from 4% to 3% whereas the adverse hospital discharge disposition rate increased from 53% to 63%. Patients treated at high case volume centers had lower rates of in-patient mortality (P=0.03) and adverse outcome at discharge (P=0.007). Physicians with high case volumes also had significantly low in-patient mortality and morbidity (P<0.001). Though the highest increase in admission charges through the decade was seen in hospitals located in the north-east (165% relative increase), the highest relative decrease in mortality and morbidity was observed in hospitals located in the mid-west and the south (67.6% and 22% respectively)

Conclusions

The annual case volume increased; the mortality and adverse hospital discharge disposition rates remained the same through the decade. High case volume hospitals and physicians had the least in-patient mortality and adverse hospital discharge disposition rates. Mortality in the elderly age group decreased.

Learning Objectives

1. to understand the trends in intracranial meningioma surgery in the United States

2. to understand the regional differences in treatment of intracranial meningiomas in the United States

Fig. 1 a Depicts the number of admissions with intracranial meningioma from 2001 to 2010. b shows the distribution of admissions according to the age group. c, d show the hospital and physician case volume quartiles respectively

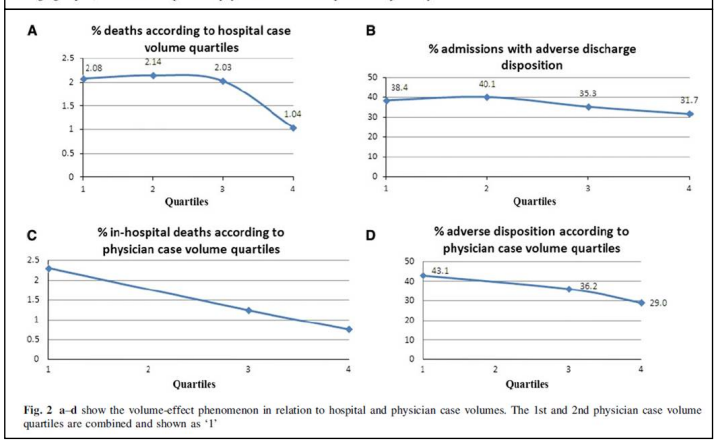

Fig. 2 a–d show the volume-effect phenomenon in relation to hospital and physician case volumes. The 1st and 2nd physician case volume quartiles are combined and shown as '1'

Table 1 Characteristics of 16,959 admissions for patie underwent craniotomy for intracranial meningioma between 2 2010

Patient characteristics	Value (all ages)	Value (20–7
Age (years)		
Mean (median; range)	57.4 (57; 1–96)	56.15 20–
Age decade (%)		
1–10	27 (0.16)	
11–20	109 (0.65)	
21–30	412 (2.44)	
31–40	1,529 (9.06)	
41–50	3,402 (20.16)	
51–60	4,143 (24.55)	
61–70	3,747 (22.21)	
71–80	2,671 (15.83)	
81–90	810 (4.80)	
91–100	23 (0.14)	
No. of patients under 18 years n (%)	96 (0.56)	NA
Female sex (%)	69.7	70.1
Race (available for 12,840 patients; %)		
Caucasian	72.8	72
African-American	10.8	11.2
Hispanic	9.2	9.4
Type of admission (available for 12,840 patients; %)		
Emergency	14.5	13.9
Urgent	11.2	10.8
Elective	74.3	75.2
Admission source (available for 12,279 patients; %)		
Emergency department	9.5	12.8
Transfer from another hospital	2.7	3.5
Transfer from other health facility	0.9	1.2
Routine	59.2	82.5
Admission on a weekend (%)	6.2	6.0

REFERENCES

1. Curry WT, McDermott MW, Carter BS, Barker FG 2nd (2005). Craniotomy for meningioma in the