



Prophylactic Antiepileptic Drugs Do Not Reduce Seizure Rates in Surgical Brain Tumor Patients

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Introduction

Currently, no clear evidence supports seizure prophylaxis in patients with cerebral tumors. However, prophylactic use of anti-epileptic drugs (AEDs) for patients undergoing brain tumor surgery is common practice. We retrospectively evaluated surgical brain tumor patients at the University of Florida for AED use and seizure outcomes.

Methods

A retrospective chart review was performed of 609 consecutive patients from 2010-2013 who underwent surgery for a brain neoplasm at the University of Florida (UF). Inclusion criteria were all patients with intra- or extra-axial tumors. Exclusion criteria were pre-existing seizure condition prior to tumor diagnosis. Data were analyzed to determine seizure incidence, AED use, and AED toxicities. The dates 2010-2013 were selected for data mining purposes; UF transitioned to an electronic medical record in 2010.

Results

609 patients met inclusion criteria. Patients who did not present with seizures preoperatively were divided into supratentorial and infratentorial groups. There were 357 patients with supratentorial tumors assessed with 297 (83.2%) receiving AEDs post-operatively and 60 (16.8%) not on AEDs. From surgery to the last follow-up, one patient (2%) in the non-AED group had a seizure and 15 (6.2%) in the AED group had seizures (p=0.5). There were 129 patients with infratentorial tumors, with 32 (24.8%) receiving AEDs and 97 (75.2%) not receiving AEDs. In the post-operative period, one patient (1.2%) in the non-AED group had a seizure and zero in the AED group had a seizure (p=1). A total of 16 (5.4%) patients in the supratentorial group and 3 (9.4%) patients in the infratentorial group on AEDs experienced toxicity related to AEDs. At discharge, 254 patients (85.5%) with supratentorial tumors without seizures remained on AEDs. At last follow up, 129 patients (53.8%) with supratentorial tumors remained on AEDs despite no seizures

Table 1: Characteristics and outcomes for supratentorial patients presenting without seizure, n (%)

	Overall (n=357)	No AED (n=60, 16.8%)	AED (n=297, 83.2%)	p-value
Age Mean (SD); median [IQR] (range)	56.7 (18.3); 60 [50, 69] (0, 94)	49.8 (24.8); 59 [32, 64.5] (0, 85)	58.1 (16.3); 61 [51, 69] (3, 94)	.001
Female, n (%)	174 (48.7)	30 (50.0)	144 (48.5)	.830
Edema (2 missing)	245 (69.0)	25 (42.4)	220 (74.3)	<.0001
Neuro signs at presentation	306 (85.7)	41 (68.3)	265 (89.2)	<.0001
AED at discharge			254 (85.5)	
#AEDs at discharge Mean (SD); median [IQR] (range)			0.76 (0.54); 1 [0, 1] (0, 3)	
#AEDs at followup Mean (SD); median [IQR] (range) (57 missing)			0.50 (0.60); 0 [0, 1] (0, 3)	
OUTCOMES				
Seizure (65 missing)	16 (5.5)	1 (2.0)	15 (6.2)	.487
AED at followup (68 missing)	133 (46.0)	4 (8.2)	129 (53.8)	<.0001
AED toxicity (53 missing)	16 (5.4)	0 (0)	16 (5.4)	1
OUTCOMES EXCLUDING PATIENTS WITH SEIZURE POSTOP ONLY				
Seizure (65 missing)	11/287 (3.8)	1/49 (2.0)	10/238 (4.2)	.697
AED at followup (68 missing)	129/284 (45.4)	4/49 (8.2)	125/235 (53.2)	<.0001
AED toxicity (53 missing)	13/299 (4.4)	0/8 (0)	13/291 (4.5)	1

Table 2: Characteristics and outcomes for infratentorial patients presenting without seizure, n (%)

	Overall (n=129)	No AED (n=97, 75.2%)	AED (n=32, 24.8%)	p-value
Age Mean (SD); median [IQR] (range)	47.9 (20.4); 51 [38, 64] (0, 84)	45.2 (20.7); 50 [30, 60] (0, 84)	53.8 (18.4); 59.5 [48.5, 66] (9, 78)	.038
Female (4 missing)	66 (51.2)	54 (55.7)	12 (37.5)	.075
Edema (9 missing)	61 (49.9)	44 (46.3)	17 (58.6)	.246
Neuro signs at presentation (4 missing)	119 (92.3)	93 (95.6)	26 (81.3)	.015
AED on discharge			19 (63.3)	
#AEDs at discharge Mean (SD); median [IQR] (range) (2 missing)			0.70 (0.60); 1 [0, 1] (0, 2)	
#AEDs at followup Mean (SD); median [IQR] (range) (9 missing)			0.39 (0.50); 0 [0, 1] (0, 1)	
OUTCOMES				
Seizure (23 missing)	1 (0.9)	1 (1.2)	0 (0)	1
AED at followup (22 missing)	12 (10.8)	3 (3.4)	9 (39.1)	<.0001
AED toxicity (92 missing)	4 (9.4)	1 (12.5)	3 (9.4)	1

Table 3: Characteristics and outcomes for all patients presenting with seizure, n (%)

	Overall (n=116)
Age Mean (SD); median [IQR] (range)	53.8 (18.5); 59 [46, 68] (4, 91)
Female	60 (51.7)
Edema (1 missing)	67 (58.3)
Neuro signs at presentation	51 (44.0)
AED at discharge (2 missing)	107 (93.9)
#AEDs at discharge Mean (SD); median [IQR] (range) (2 missing)	1.2 (0.67); 1 [1, 1] (0, 4)
AED at followup (23 missing)	69 (74.2)
#AEDs at followup Mean (SD); median [IQR] (range) (23 missing)	1.0 (0.83); 2.01 [1, 1] (0, 4)
AED toxicity (6 missing)	15 (13.6)

Conclusions

AEDs do not significantly reduce post-operative seizures in surgical brain tumor patients in this analysis. Additionally, once a patient is prescribed an AED, discontinuation of AED therapy is unlikely, even if the patient remains seizure free.

Learning Objectives

By the conclusion of this session, participants should be able to thoughtfully discuss the clinical practice and appropriateness of prophylactic anti-epileptic therapy in patients with brain tumors who are undergoing surgery.