Poster 586

Factors Leading to >2 Antiseizure Medication Trials Prior to Epilepsy Surgery Referral in Children

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BACKGROUND

- **Drug resistant epilepsy** (DRE) is defined as failure of two appropriately selected and dosed anti-seizure medications (ASMs) to control seizures.
- **Epilepsy surgery** is often the most promising alternative for children with focal DRE in order to become seizure free.
- Continued ASM trials may delay surgical treatment. Such a delay has been associated with **adverse cognitive, developmental, and seizure outcomes**, particularly in very young children.
- Identifying DRE-patient characteristics that lead to > 2 ASM failures prior to surgical evaluation may **help identify opportunities to shorten the duration to surgical evaluation**.

METHODS

- This **prospective cross sectional study** utilized the Pediatric Epilepsy Research Consortium Epilepsy Surgery Database, which collects patient data from 19 US pediatric epilepsy centers to identify children ≤18 years old undergoing initial epilepsy surgery evaluation.
- Children without data on number of failed ASMs prior to referral were excluded from further analysis.
- Demographics, epilepsy characteristics, pre-surgical evaluation, surgical therapy and outcome variables were compared between patients failing ≤ 2 and >2 ASMs at the time of evaluation.
- Time to referral was defined as duration from age at DRE diagnosis to age at referral for presurgical evaluation.
- We compared **seizure outcome after surgery** (Favorable: Engel 1 or 2; Unfavorable: Engel 3 or 4) between those failing ≤ 2 and >2 ASMs prior to referral for characteristics of significance.
- Statistical analysis performed with SPSS (IBM, NY).

RESULTS

- 399 patients met inclusion/exclusion criteria (200 ≤ 2 ASMs and 199 >2 ASMs)
- **Children failing >2 ASMs were younger at seizure onset** (Fig 1; median 3y vs 5.1y; $p<0.001$) **and had longer duration to surgical referral** (Fig 2; median 1.4y vs 0.3y; $p<0.001$)
- Children failing **>2 ASMs** were more likely to have an **abnormal neurological exam** ($p<0.001$)
- Children failing **<2 ASMs** were more likely to **have surgery performed** ($p = 0.02$)
- **Children failing >2 ASMs were less often offered surgical treatment** ($p=0.02$) **and more frequently underwent large resections** (Fig 3; $p=0.001$) **or palliative procedures** ($p=0.001$)
- 138 (35%) children had surgery and at least one post-op outcome recorded (median 6m, 0-10m)
- **48% of palliative procedures had favorable surgical outcomes** (Engel 1 or 2)
- Abnormal neurological exam, etiology, and number of failed ASMs did not impact surgical outcome
- No significant differences between the two groups were present for gender, ethnicity, race, insurance type, or distance to surgical center

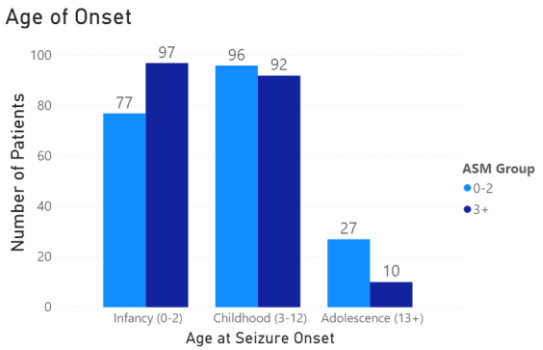

Figure 1: Children failing >2ASMs were younger at seizure onset.

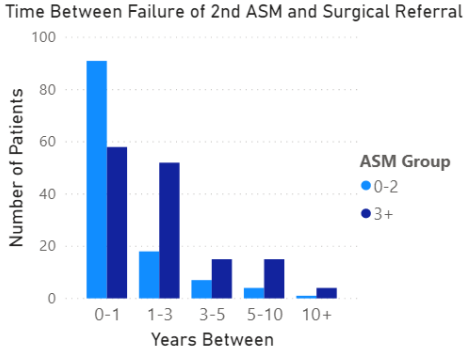

Figure 2: Children failing >2 ASMs had a longer duration to surgical referral

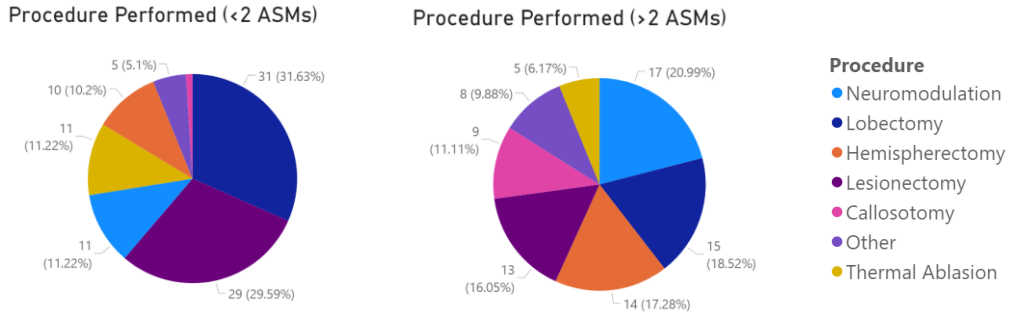

Figure 3: Children failing >2 ASMs more often underwent larger resections (i.e. hemispherectomy) compared to children failing <2ASMs.

Table: Patient characteristics of significance comparing patients failing ≤ 2 and >2 ASMs prior to referral for surgical evaluation

Variables	<2 Failed ASMs %, (n)	>2 Failed ASMs %, (n)	Significance
Type of 1st Seizure (n=397)			
Focal Onset	89.5% (178)	81.3% (161)	
Generalized Onset	6.5% (13)	15.7% (31)	$p=0.054$
Unknown Onset	3.5% (7)	3% (6)	
Subclinical Onset	0.5% (1)		
Frequency of Seizures (n=397)			
Daily	29.7% (59)	45% (89)	
Weekly	32.2% (64)	32.3% (64)	$p<0.001$
Monthly	21.6% (43)	15.7% (31)	
>Monthly	16.6% (33)	7% (14)	
Etiology (n=410, >1 option allowed)			
Structural Congenital	33.5% (68)	24.5% (51)	
Structural Acquired	27.1% (55)	24.5% (51)	
Genetic	6.9% (14)	14.9% (31)	$p=0.053$
Infectious	1.5% (3)	1% (2)	
Inflammatory/Autoimmune	1% (2)	3.8% (8)	
Metabolic	0% (0)	0.5% (1)	
Unknown	28.5% (58)	28.8% (60)	
Other	1.5% (3)	2% (4)	
Other Failed Treatments (n=409, > 1 option allowed)			
None	92.1% (187)	74.7% (154)	
Dietary Therapy	4.4% (9)	18% (37)	$p<0.001$
Vagal Nerve Stimulator	2% (4)	4.4% (9)	
Other	1.5% (3)	2.9% (6)	

CONCLUSIONS

- **Failure of >2 ASMs** prior to surgical referral is **associated with younger age at seizure onset, longer duration to surgical evaluation**, abnormal neurological exam, daily seizures, and failure of other non-ASM treatments
- Abnormal neurological exam and seizure frequency do not predict outcome suggesting **delay for surgical evaluation may be unnecessary**
- Children with **>2 ASM trials** are **less likely to be rendered seizure free** from surgery
- Almost half of the children with >2 ASM trials undergoing **palliative surgery showed seizure reduction** (Engel 1 or 2)
- Recognizing characteristics leading to delayed surgical referral **may shorten duration to surgery and improve outcomes**