Electroclinical Characteristics of Patients with Childhood Absence Epilepsy for Seizure / EEG Outcomes

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OBJECTIVES

To evaluate seizure semiology and ictal / interictal video electroencephalogram (EEG) characteristics in children with childhood absence epilepsy (CAE) with respect to seizure / EEG outcomes.

MATERIAL & METHODS

The video-EEG recordings of 164 of 41 patients were reanalyzed;

(1) The following ictal / interictal EEG characteristics were defined: seizure duration, epileptic discharge morphology, poor synchronization, seizure burden of hyperventilation , 'lead in' (Figure 1)

(2) The semiologic features and clusters (Figure 2 A-B)

Were also analyzed as predictors of seizure and EEG outcomes at the 3rd, 6th, 12th, and 24th months

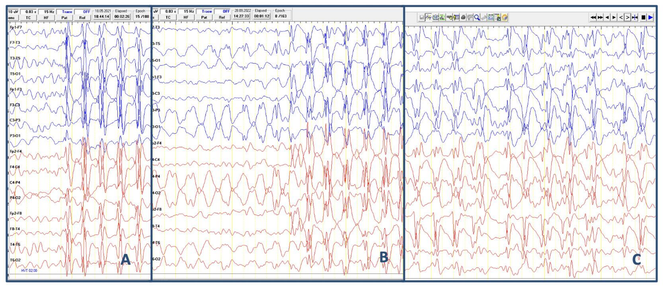

Figure 1: A: Typical absence ictal EEG B: "Lead in" C: Poor synchronization

Furthermore, specific follow-up time intervals were utilized to assess the outcomes cluster: Group A (no seizures and normal EEG), Group B (no seizures and abnormal EEG), Group C (seizures persist), and Group D (relapse subsequent to seizure-free and normal EEG).

RESULTS

- Besides hallmark manifestations of absence seizures, additional semiologic features were identified in 86.6% of the total seizures.
- Automatism and eye blinking were observed at rates of 68.3% and 66.5%, respectively.
- The seizure duration was significantly greater in the presence of both automatisms and eye involvement as compared to the group without these features (*mean duration: 13.5 seconds vs. 7.6 seconds; p=0.001*) (Figure 2A).

ELECTROCLINICAL FAETURES	CLUSTERS OF OUTCOMES												
	6th months				12th months				24th months				
	Group A 9 (22)	Group B 21 (51.2)	Group C 11 (26.8)	p	Group A 13 (36.1)	Group B 16 (44.4)	Group C 7 (19.4)	p	Group A 14 (58.3)	Group B 6 (25)	Group C 3 (12.5)	Group D 1 (4.2)	p
Automatism	7 (77.8)	14 (66.7)	9 (81.8)	0.616	8 (61.5)	13 (81.3)	5 (71.4)	0.499	9 (64.3)	5 (83.3)	2 (66.7)	1 (100)	0.757
Eye blinking	6 (66.7)	17 (81)	7 (63.6)	0.509	10 (76.9)	11 (68.8)	5 (71.4)	0.886	10 (71.4)	2 (33.3)	3 (100)	1 (100)	0.162
Eye deviation	2 (22.2)	7 (33.3)	5 (45.7)	0.549	4 (30.8)	6 (37.5)	3 (42.9)	0.855	4 (28.6)	1 (16.7)	2 (66.7)	1 (100)	0.222
Head retropulsion	-	4 (19)	2 (18.2)	0.371	-	5 (31.3)	1 (14.3)	0.079	1 (7.1)	1 (16.7)	-	-	0.817
Vocal features	-	-	3 (27.3)	0.012	-	1 (6.3)	2 (28.6)	0.081	1 (7.1)	-	-	-	0.862
Presence of comorbidity	-	4 (19)	6 (54.5)	0.013	2 (15.4)	4 (25)	4 (57.1)	0.131	1 (7.1)	1 (16.7)	3 (100)	-	0.004
Seizure duration (>20 second)	4 (50)	2 (9.5)	2 (18.2)	0.050	4 (33.3)	1 (6.3)	2 (28.6)	0.170	2 (14.3)	-	1 (33.3)	1 (100)	0.077
Need of second ASM	1 (11.1)	3 (14.3)	6 (54.5)	0.024	3 (23.1)	4 (25)	3 (42.9)	0.607	2 (14.3)	2 (33.3)	2 (66.7)	-	0.242
OIRDA	1 (11.1)	4 (19)	2 (18.2)	0.864	1 (7.7)	4 (25)	1 (14.3)	0.453	2 (14.3)	-	1 (33.3)	-	0.526
Interictal SW discharge	3 (37.5)	4 (19)	5 (45.7)	0.264	1 (7.7)	5 (31.3)	4 (57.1)	0.048	5 (35.7)	2 (33)	1 (33)	-	0.911
Lead-in	2 (22.2)	3 (14.3)	7 (63.6)	0.012	3 (23.1)	2 (12.5)	6 (85.7)	0.002	-	2 (33.3)	3 (100)	1 (100)	0.001
Poor synchronization	2 (22.2)	11 (52.4)	6 (54.5)	0.258	5 (38.5)	8 (50)	4 (57.1)	0.695	5 (35,7)	3 (50)	2 (66.7)	1 (100)	0.508

Table 1: Electroclinical characteristics of patients for cluster of outcomes

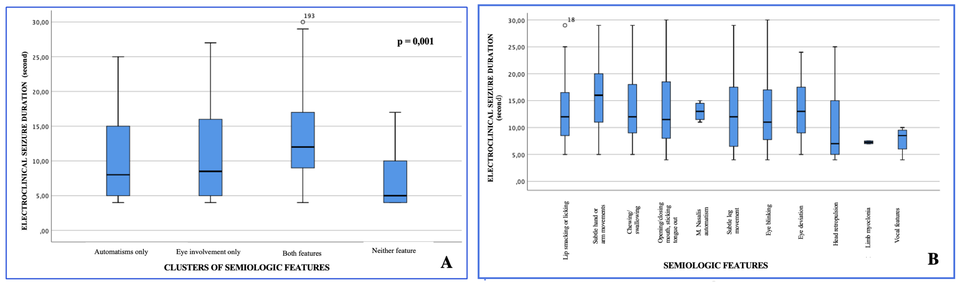

Figure 2: Electroclinical seizure durations according to semiologic features and cluster of semiologic features

- The presence of vocal characteristics of the clinical seizure (1) , polyspike and wawe discharges (2) , and poor synchronization of ictal EEG features (3) were all associated with poor seizure outcomes in the first year.
- The existence of eye deviation and 'lead in' the ictal EEG were found to be significantly linked to poor seizure outcomes for the entire duration of the follow-up period ($p<0.05$) (Table 1).
- Although the presence of head retropulsion were not associated with seizure outcomes, there was a significant association with EEG outcomes.
- The seizure burden during the hyperventilation period was the predominant predictor of poor seizure outcome at the 3rd month (p=0.048).

CONCLUSIONS

We defined that the certain semiologic features (*ocular deviation, vocal characteristics, and head retropulsion*), and the ictal EEG characteristics (*poor synchronization and 'lead in'*) are the predominant predictors for seizure and EEG outcomes in patients with CAE.

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