Clinicodemographic Characterization of Paroxysmal Nonepileptic Events in Children and Adolescents Admitted to The Epilepsy Monitoring Unit: A retrospective study

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Background

Non-epileptic events (NEEs) are commonly observed in children and adolescents, and these paroxysmal events can be challenging to differentiate from epileptic seizures (1). Video electroencephalogram monitoring is the gold standard for achieving an accurate diagnosis. Thus, several patients are referred to the epilepsy monitoring unit (EMU) for the evaluation of episodic events (2).

Aim

To describe the prevalence of NEEs among children and adolescents admitted to the EMU, and the clinical and demographic features of such events.

Methods

We retrospectively evaluated all pediatric and adolescent patients aged 18 years and below who were admitted to the EMU of King Fahad Medical City, Riyadh, KSA, from January 2014 to March 2020. Patients whose events were deemed to be epileptic in nature, those with incomplete medical charts, and those whose EMU course of admission was interrupted due to medical or nonmedical reasons were excluded. The following data were collected: patients' demographics, type of NEE, presence of neurological impairments, concomitant epilepsy and number of AEDs used in those not known to have a concomitant epilepsy. SPSS version 22.0 was used for analysis.

Results

629 were included in this study. 159 of the patients included (25.28%) (male: 49.1%, female: 51.9%) had NEEs, with a female predominance in the adolescent population (table 1) Psychogenic NEEs (PNESs, 29.6%) were most commonly observed among all age groups followed by movement disorders (23.3%).

Movement disorders were more frequently noted in the younger age group, and of which benign sleep myoclonus was the commonest presentation (47.5%). However, Migraine was more common in school-aged children and adolescents usually presented with PNESs.

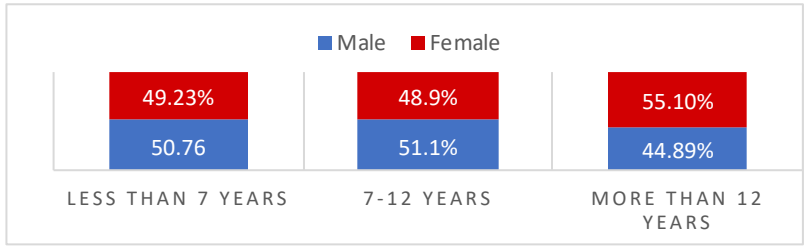

Table 1: Male to famle distribution based on age.

Prevalence of NEEs in patients with neurological impairments, concomitant epilepsy, and/or both neurological impairments & concomitant epilepsy

Non-epileptic events	Neurological impairment	Epilepsy	Epilepsy & neurological impairment	Percentage
Psychogenic non-epileptic seizure	4 (8.5%)	10 (21.3%)	4 (8.5%)	47 (29.6%)
Staring	2 (33.3%)	2 (33.3%)	1 (16.7%)	6 (3.8%)
Anoxic/cerebral hypoperfusion	2 (15.4%)	3 (23.1%)	1 (7.7%)	13 (8.2%)
Migraine	1 (14.3%)	1 (14.3%)	1 (14.3%)	7 (4.4%)
Movement disorder	21 (56.8%)	22 (59.5%)	17 (45.9%)	37 (23.3%)
Sleep variant/disorder	2 (22.2%)	5 (55.6%)	2 (22.2%)	9 (5.7%)
Stereotype	8 (66.7%)	9 (75.0%)	7 (58.3%)	12 (7.5%)
GERD	3 (37.5%)	2 (25.0%)	2 (25%)	8 (5.0%)
Miscellaneous (others)	4 (23.5%)	10 (58.8%)	2 (28.6%)	17 (10.7%)
Self-gratification	2 (66.7%)	1 (33.3%)	1 (33.3%)	3 (1.9%)
Total	49 (30.8%)	65 (40.9%)	38 (23.9%)	159 (100.0%)

Table 2: Prevalence of NEEs based on neurological comorbidties.

- 30.8% of patients had underlying neurological impairment.
- Stereotypes, self-gratification and movement disorder, were commoner in with neurological impairment (P value = 0.0, 95% confidence interval).
- Approximately 41% of patients with non-epileptic events presented with concomitant epilepsy. Patients with stereotype, movement disorder, and miscellaneous events and those with sleep variant/disorder were more likely to present with an underlying diagnosis of epilepsy (75%, 59.9%, 58.8%, and 55.6%, respectively; P = 0.0, 95% confidence interval).

Prevalence of NEEs in patients with neurological impairments, concomitant epilepsy, and/or both neurological impairments & concomitant epilepsy

Non-epileptic events	AEDs					Percentage n = 159
	1	2	3	4	5	
Psychogenic non-epileptic seizure	9 (52.9%)	4 (23.5%)	2 (11.8%)	1 (5.9%)	1 (5.9%)	17 (10.7%)
Staring	2 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.3%)
Anoxic/cerebral hypoperfusion	0 (0.0%)	0 (0.0%)	1 (100.0%)	0 (0.0%)	0 (0.0%)	1 (0.6%)
Migraine	1 (50.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.3%)
Movement disorder	1 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.6%)
GERD	0 (0.0%)	1 (50.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)	2 (1.3%)
Miscellaneous (others)	2 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.3%)
Total	15 (55.6%)	6 (22.2%)	4 (14.8%)	1 (3.7%)	1 (3.7%)	27 (17%)

Table 3: Prevalence of AEDs use in patients with NEE in the absence of concomitant epilepsy.

Patients with psychogenic non-epileptic events (PNESs) were commonly treated with at least one AED. Similarly, only one patient with PNES previously received five AEDs.

Conclusion

The prevalence of NEEs was 25.28%, and this result is similar to that reported in the literature. The distribution of events is mainly based on age and is likely correlated with underlying comorbidities. Moreover, potential unnecessary use of AEDs is probably related to type NEE. Clinical and video-based assessments are important in the identification of such events to prevent unnecessary treatment with antiepileptic medications.

Acknowledgment

None

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