

Benign Rolandic Epilepsy (BRE): Seizure Semiology and the Role of an EEG Study

Raafat Hammad Seroor Jadah, MBBCH, BAO (NUI), LRCP & SI* Yusra Mirghani Aljailani, MBBS** Lateefa Aref Ahmed, MB, BCh, BAO*** Ayesha Zaidi, MS****

ABSTRACT

Background: Benign childhood epilepsy with centrotemporal spikes (BECTS) also called Benign Rolandic Epilepsy (BRE) is a common form of childhood epilepsy syndrome. It often occurs during sleep and is characterized by episodes of simple partial motor seizures of the face and/or oropharynx. The aim of this study is to investigate the most common seizure semiology associated with BRE and the role of electroencephalogram (EEG) in this childhood epilepsy syndrome.

Aim and Methods: In this study we conducted a retrospective chart review of patients with BRE who presented to Bahrain Defense Force Hospital (BDF), Kingdom of Bahrain during the period of January 2017 to December 2019. Sixty-nine children were included. Their demographics, description of seizure semiology and their EEG findings were analyzed using descriptive statistical analysis on SPSS and the results are presented in pie and bar charts.

Results: Out of 69 children who were diagnosed with BRE, 36 (52.1%) were found to be males indicating male gender predominance. the average age of the first episode was found to be of 6 years. Most of the patients had their seizures while asleep (88.4%) and we also identified focal seizure as the most common semiology associated with BRE accounting for 61 (88.4%) children followed by hypersalivation 7 (10.1%). We discovered that abnormal EEG findings were found in 45 (65.2%) of total sample size. Out of these, 28 (62.2%) had centrotemporal epileptiform spikes and wave discharges. The other findings that were found in our study demonstrate the important role of EEG in diagnosing BRE and the importance of further future studies.

Conclusion: Most common semiology was focal seizure followed by hypersalivation. The majority of EEG's were abnormal with the commonest finding being centrotemporal epileptiform spike and wave discharges.

Keywords: Benign Rolandic Epilepsy, Seizure semiology, Hypersalivation

INTRODUCTION

Benign childhood epilepsy with centrotemporal spikes (BECTS) being well known as Benign Rolandic Epilepsy (BRE) is the most common form of focal childhood epilepsy, representing 15-25% of epilepsy syndrome in children below the age of 15 years¹.

BRE is often misdiagnosed despite being a common seizure syndrome, this may be due to the short-lasting and mostly nocturnal nature of the seizures which makes it difficult to identify during a routine EEG study².

This childhood epilepsy syndrome usually presents in normally developed early school-age children with a peak incidence between 7 and 10 years of age³. BECTS is seen more commonly in male children⁴.

This epilepsy syndrome involves simple partial motor seizures of the face and/or oropharynx that may manifest with symptoms including facial twitching, facial numbness, drooling of saliva or dysphagia. This is because of the seizure origin in the perisylvian sensorimotor cortex in the brain (Rolandic area) which control these areas⁵.

The aim of this study is to investigate the most common seizure semiology associated with BRE and the role of EEG in this childhood epilepsy syndrome.

METHODS

In this study we conducted a retrospective hospital-based chart review of pediatric patients diagnosed with BRE who presented to BDF, Kingdom of Bahrain during the period of January 2017 to December 2019.

The inclusion criteria of this study include children with normal developmental milestones admitted in the pediatric ward with BRE between the age of 1 day and 14 years and the exclusion criteria included any children above the age of 14 years and children with developmental delay. As a result, three children were excluded from the study as they were found to have developmental delay.

Data was collected using a data collecting sheet and analyzed using Statistical Package for Social Science (SPSS) and Microsoft Excel 2010. It was then presented using descriptive statistics.

* Consultant Pediatric Neurologist
Bahrain Defense Force Hospital
Bahrain. E-mail: nader212@hotmail.com

** Medical Intern

*** Medical Intern

**** RCSI Medical Student

Consent was sought from the research committee at BDF hospital. Patient’s privacy and confidentiality was maintained, and there were no conflicts of interest in writing this research.

RESULTS

Our study population included a total of 69 children diagnosed with BRE. Thirty-three (47.8%) were female while 36 (52.1%) were males, indicating a male gender predominance (Figure 1) with an average age of six years.

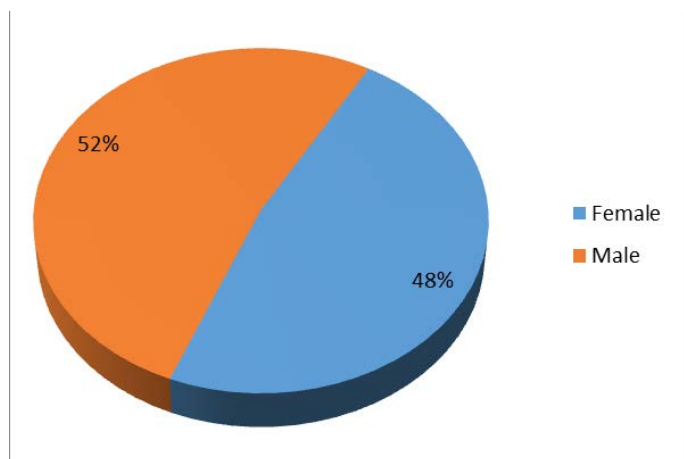


Figure 1: Male to female ratio in children with BRE

The majority of the affected children had their seizure during sleep, which include 61 (88.4%) cases, while only 8 (11.5%) had their seizure while they were awake.

Focal seizure was found to be the most common semiology, which occur in 61 (88.4%) of total cases. Moreover, hypersalivation accounts for 7 (10.1%) of all cases making is the second most common semiology. Whilst, only 1 (1.4%) child was found to have automatism in the form of lip smacking (Figure 2).

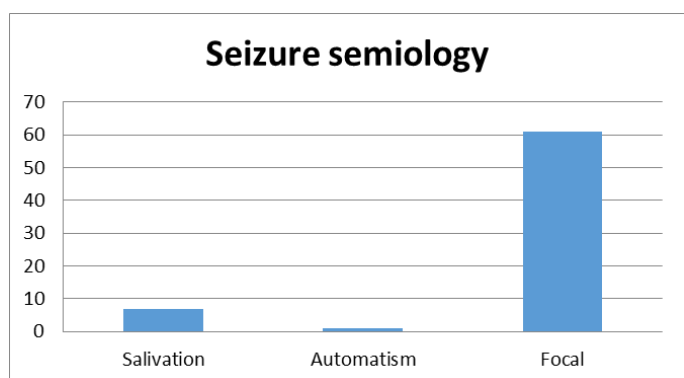
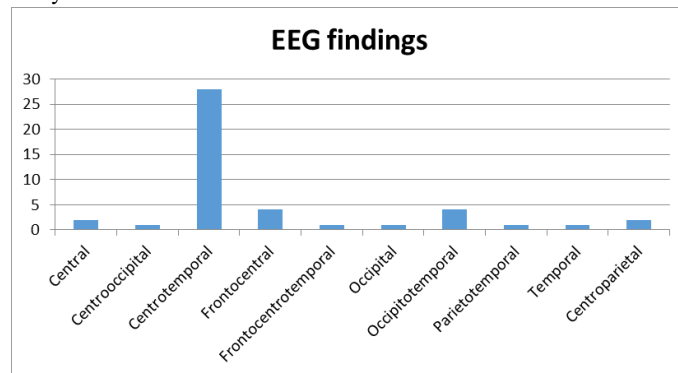


Figure 2: Seizure semiology in BECTS.

All 69 children underwent an EEG as part of their initial investigations to confirm the diagnosis of BECT, twenty-four (34.7%) of all children had a normal EEG while 45 (65.2%) had an abnormal EEG finding. These findings included: centrottemporal epileptiform spike and wave discharges is the most common EEG finding as it was found in 28 (40.5%) of total children with abnormal EEG findings. Other findings include frontocentral and occipitotemporal epileptiform spike and

wave discharges that accounted for 4 (5.8%). Two patients (2.3%) were found to have central wave discharges while another 2 cases (2.3%) had centroparietal epileptiform wave discharges. Other less common EEG findings associated with BRE include: Centrooccipital, frontocentrottemporal, occipital, parietotemporal and temporal epileptiform spikes wave discharges (Figure 3).

Figure 3: EEG findings in children with BRE who had abnormal EEG study.



DISCUSSION

The results obtained in this study reflected on the data collected from hospital records of children with BRE who were admitted from the period of January 2017 to December 2019 in the pediatric ward in BDF RMS, Kingdom of Bahrain. Among the 69 children included in this study, male gender predominance was noted at (52.1%) compared to females (47.8%). In a study conducted in 2018, H. Kim et al; also noted that males were predominant, with a male to female ratio of 1.73:1⁴.

Furthermore, in our study the average age of children with BRE was 6 years. In Carmen Silvia et al, a study conducted in Brazil, concluded that the average age of BRE was 6 years which is similar to our study¹.

Data collected showed that the majority of the children had an episode during sleep with a percentage of 88.4% which is similar to a study done in Shreveport, USA by Chaitanya Amrutkar, Rosario M.Riel-Romer, states that BRE usually occurs at night or on awakening in greater than 70%³.

Children presented with multiple semiology such as focal seizure, hypersalivation and automatism, with the commonest being focal accounting for 61 (88.4%) of the total number of included children, followed by hypersalivation which accounts for 7 (10.1%) and only 1 (1.4%) child had a seizure in form of automatism in the form of lip smacking. In a study conducted in 2013 in Saudi Arabia showed that (75%) cases had simple partial seizures while (25%) had secondary generalization⁶.

An EEG was done on all children included in our study, 65.2% showed an abnormality in their EEG. Most abnormal EEG’s showed centrottemporal spikes, which is consistent with the current researched data which suggests that an EEG of high voltage, centro-temporal sharp spikes followed by a slow wave is the commonest EEG form in BRE³.

Furthermore, since 34.7% showed a normal EEG henceforth a normal EEG would not exclude this condition. As research showed that an EEG is not conclusive. Although the Centro-temporal spikes on EEG are characteristic for BRE, they are rarely seen in asymptomatic children³.

LIMITATIONS

One limitation of this research study is that it is being a retrospective study where data was collected using data sheet from records of all children diagnosed to have BRE. Furthermore, the sample size of population of this study was limited to 69 patients. Further future studies are needed.

CONCLUSION

In conclusion, BRE is the most common epilepsy in pediatric population with male patients commonly affected, Partial epilepsy is the most common semiology associated with BRE followed by hypersalivation. Most patients with BRE have an abnormal EEG result with centrotemporal epileptiform spikes and wave discharges.

Authorship Contribution: All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

Potential Conflict of Interest: None.

Competing Interest: None.

Sponsorship: None

Acceptance Date: 12 August 2021

Ethical Approval: Approved by the research and ethic committee, Bahrain Defense Force Hospital, Bahrain.

REFERENCES

1. Jun YH, Eom TH, Kim JM. Concomitance of benign epilepsy with centrotemporal spikes and childhood absence epilepsy: an unusual case. *Neurol Sci* 2019;40(9):1979-80.
2. Sathyanarayana A, El Atrache R, Jackson M, et al. Nonlinear Analysis of Visually Normal EEGs to Differentiate Benign Childhood Epilepsy with Centrotemporal Spikes (BECTS). *Sci Rep* 2020;10(1):8419.
3. Amrutkar C, Riel-Romero RM. Rolandic Epilepsy Seizure. *Stat Pearls* 2021.
4. Kim H, Kim SY, Lim BC, et al. Spike persistence and normalization in benign epilepsy with centrotemporal spikes - Implications for management. *Brain Dev* 2018;40(8):693-8.
5. Miziara CS, Manreza ML. Benign focal epilepsy of childhood with centrotemporal spikes (BECTS): clinical characteristics of seizures according to age at first seizure. *Arq Neuropsiquiatr* 2002;60(2-B):390-4.
6. Saeed M, Azam M, Shabbir N, et al. Is "benign Childhood Epilepsy with Centrotemporal Spikes" Always Benign? *Iran J Child Neurol* 2014;8(3):38-43.