RESEARCH ARTICLE

A comparative study to investigate the level of cognitive impairment among epileptic and psychogenic non-epileptic patients

Noreena Kausar, Hafsa Qurban, Bushra Bibi

Abstract

Objective: To compare cognitive impairment between patients having epileptic seizures and those having psychogenic non-epileptic seizures.

Methods: The cross-sectional study was conducted from May to November 2016 in Jhelum, Pakistan, and comprised epileptic and psychogenic non-epileptic patients who were selected from different psychiatric units of the city. Bender Gestalt Test-II was administered to check the cognitive impairment of participants. Data was analysed using SPSS 21.

Results: Of the 125 subjects, 62(49.6%) were epileptic and 63(50.4%) were psychogenic non-epileptic patients. Psychogenic non-epileptic patients performed better compared to epileptic patients ($p \leq .001$). The effect size of the finding was 0.42, indicating medium size effect.

Conclusion: Epileptic patients were found to have more cognitive impairment than psychogenic non-epileptic patients.

Keywords: Cognitive impairment, Epileptic, Psychogenic non-epileptic, Seizures, Bender Gestalt Test.

(JPMA 71: 420; 2021) **DOI: https://doi.org/10.47391/JPMA.283**

Introduction

Cognition is considered an important aspect of human life. Cognitive impairment (CI) is a deficiency of mental processes that lead to problems related to acquired information, knowledge, understanding and responding to stimulus in the world.[1] CI ranges from mild to severe. Alzheimer's Disease Research Centre (ADRC) analyses that subtle changes in brain function, thinking, recognition and memory occur in someone who had mild CI and have little changes in their ability to do their usual everyday work. Severe CI levels can lead to difficulties in different abilities which include understanding the meanings, importance of different stimulus, to talk or write and the loss of ability to live self-sufficiently, according to the World Health Organisation (WHO).[2] There are different causes of CI, such as regional brain shrinkage, traumatic brain injury, psychiatric disorders and seizures.[3-6] Two major categories of seizures are epileptic seizures (ESs) and psychogenic non-epileptic seizures (PNESs) which are different from each other in duration, frequency, triggers and movements.[7] Epilepsy is a common serious neurological condition with a tendency to have seizures that start in the brain with burst of electrical impulses, and which is usually only diagnosed after a person has had more than one seizure.[8] A study stated that overall prevalence of epilepsy was estimated to be 1% in global population and about 2% in Pakistan. The ratio of disease is high in rural areas. Only 27.5% epileptic persons in urban areas and 2.9% in the rural areas even consider it a disease and go to a doctor for treatment.[9] These seizures affect patient's feelings, emotions, thinking, behaviour and cognition. ESs have consequences in different domains of individuals such as biological, emotional, cognitive, psychological, and social.[10] PNESs look like epileptic fits which occur due to psychological distress. It may also attack during medical procedures, which may not only disrupt the treatment, but may alarm doctors enough to initiate further medical assessments and treatments plans.[11] Media[12] narrated quoted a WHO report and described that conversion disorder, a PNES, was the second most common diagnosed issue, after depression, made among female patients admitted to Lady Reading's Hospital Peshawar between January and November 2014. The prevalence of conversion is very high among young females, single girls and people with low levels of education. Persons with uncontrollable seizures or with more frequency of seizures per a day frequently face lifelong intellectual, CI and developmental disability. According to a study,[13] ES and PNES patients have CI in the United States, but patients with PNES have more CI compared to ES patients. On the other hand, a study[14] reported that ES patients have more CI compared to PNES patients in Turkey. A study[15] indicated that 25% children with epilepsy had subtle cognitive deficits compared to the normal group. Further, seizures also have effects on cognition in consequences of more onset or duration and uncontrolled nature of seizures. A study[16] reported that epileptic fits have dangerous effects on cognition, mental process and performance with uncontrolled and long onset of seizures which lead to dementia. A study on patients of mild CI of conversion to Alzheimer disease (AD)reported that the patients had deficits in different

Department of Psychology, University of Gujrat, Pakistan.

Correspondence: Bushra Bibi. e-mail: bushra.bibi@uog.edu.pk

functions of brain which included verbal memory and psychomotor speed, strongly predicting conversion to AD.[17] Cognition plays important role for both categories of patients to understand their seizures type and its management. Further, it is also helpful to manage their life. Both ES and PNES categories of seizures are misdiagnosed with each other. A study[18] reported that ES and PNES are still misdiagnosed in the United Arab Emirates (UAE). Pakistan also needs to improve the correct diagnosis of both the categories. The current study was planned to compare CI between ES and PNES patients, and to measure CI in relation to duration of seizures.

Patients and Methods

First, the permission was taken from the research institutional review board of university of Gujrat. This cross-sectional study was conducted from May to November 2016 in Jhelum, Pakistan, and comprised ES and PNES patients who were selected from different psychiatric units of the city.

The sample was raised using non-probability purposive sampling technique from among the target population after permission from medical superintendent or medical officer of the participating units. Those included were patients of either gender aged 4-60 years with seizures diagnosis by psychiatrists and psychologists with the help of electroencephalogram (EEG) and according to the definitions of the Diagnostic and Statistical Manual of Mental Disorders-5th edition (DSM-V).[19] Patients having seizures with physical, neurological and other mental illnesses were excluded, and so were those who did not sign the informed consent form and those who did not have a confirmed diagnosis of the seizure type.

After taking written informed consent from the subjects, data was collected regarding a participant's CI using Bender Gestalt Test II (BGT-II), which measures visual-motor integration skills and CI in children and adults aged 4-85+ years. It is widely used in clinics, research related to patients with seizures to measure CI.[20,21] BGT-II consists of 16 cards; the first four designs are only used with the lower age range 4-7 years, 11 months, and the last three designs are used exclusively with the upper range 8-85+ years. To amplify the test's clinical value, a recall phase and two supplementary motor and perception tests were also added. Demographic data, including age, gender, education, seizure type, duration of illness and socioeconomic status, was also noted. The test was individually administered and it took about 12-16 minutes per patient.

Data was analysed using SPSS 21. For descriptive analysis, frequencies and percentages were computed. To compare CI of the participants, independent t test was used and one-way analysing of variance (ANOVA) was used to compare participants' CI according to seizure onset.

Results

Of the 125 subjects, 62(49.6%) were epileptic and 63(50.4%) were psychogenic non-epileptic patients. Overall, there were 65(52%) men and 60(48%) women (Table 1).

BGT-II subscales and supplementary tests indicated that RS patients had lesser mean values than PSNE patients (p<0.05) levels. BGT-II-Total score of both ES and PNES

Table-1: Demographic characteristics.

Variables	Categories	n (%)
Seizure Type	ES	62 (49.6)
	PNES	63 (50.4)
Gender	ES Boys	34 (27.2)
	ES Girls	28 (22.4)
	PNES Boys	31 (24.8)
	PNES Girls	32 (25.6)
Age	4-20 ES	33 (26.4)
	21-40 ES	26 (20.8)
	41-60 ES	3 (2.4)
	4-20 PNES	31 (24.8)
	21-40 PNES	30 (24.0)
	41-60 PNES	2 (1.6)
Onset of Seizures	ES less than 1 year	18 (14.4)
	ES 1 years to 7 years	17 (13.6)
	ES 8 year to 14 years	15 (12.0)
	ES 15 year to 21 years	6 (4.8)
	ES 22 year to 28 years	4 (3.2)
	ES 28 year to 35 years	2 (1.6)
	PNES less than 1 year	21 (16.8)
	PNES from 1 to 7 years	22 (17.6)
	PNES from 8 to 14 years	15 (12.0)
	PNES from 15 to 21 years	5 (4.0)
	PNES from 22to 35 years	-
Total		125 (100)

ES: Epileptic seizures; PNES: Psychogenic non-epileptic seizures

Table-2: Cognitive impairment.

Scale phase	Seizure's type	Mean±SD	*p*-value
Copy phase	ES	24.11±9.61	0.002*
	PNES	25.14±5.90	
Recall phase	ES	5.80±4.48	0.001*
	PNES	8.50±3.37	
Perception test	ES	7.22±2.34	0.006*
	PNES	7.52±1.57	
Motor test	ES	9.06±2.61	0.005*
	PNES	10.11±1.95	
BGT-Total	ES	45.74±16.33	0.001*
	PNES	51.50±10.38	

p≤0.05, ES: Epileptic seizures; PNES: Psychogenic non-epileptic Seizures; BGT: Bender Gestalt Test.

Table-3: Cognitive impairment of participants according to onset of seizures on Total-BGT

Scale phase	Onset of Seizure	Seizure type	Mean±SD	*p*-value
BGT-Total	Less than 1 year	ES	52.55±19.85	0.002*
	1 to 7 years	ES	47.05±10.12	
	8 to 14 years	ES	39.13±16.98	
	15 to 21 years	ES	48.00±16.58	
	22 to 28 years	ES	36.75±10.01	
	29 to 35 years	ES	34.00±8.48	
	less than 1 year	PNES	58.57±7.92	
	1 to 7 years	PNES	48.72±7.86	
	8 to 14 years	PNES	46.40±6.81	
	15 to 21 years	PNES	49.40±21.53	
	22to 28 years	PNES	-	
	29 to 35 years	PNES	-	

p≤0.05; ES: Epileptic seizures; PNES: Psychogenic non-epileptic seizures; BGT: Bender Gestalt Test. SD: Standard deviation

groups indicated that ES patients had more CI compared to PNES patients ($p \leq 0.05$) (Table 2).

CI in relation to onset of seizures showed that the mean values of ES patients were lesser than PNES the patients, indicating that ES patients had more CI than PNES patients (Table 3).

Discussion

The findings showed that ES patients had more CI compared to PNES patients, which is similar to an earlier study done in Turkey.[14]

In the current study, ES patients had more CI than PNES patients. Pakistan and Turkey have the same epidemiology of epilepsy to some extent. a study concluded that prevalence of epilepsy was little higher in Pakistan than in Turkey, with both countries having high prevalence in rural areas compared to urban areas, and there were minimal differences in age and gender distribution, with slightly higher mean values of Pakistani patients in relation to onset of seizures, while the overall frequency of seizures type was equal in both countries.[22] Only 3% people in Pakistan and 71% in Turkey thought that these seizures were due to supernatural causes, avoided medical care owing to that belief, and, as a consequence, begin to notice CI and many other psychological and mental disorders.[22]

In one study that recent memory, remote memory, attention and concentration, immediate recall, delayed recall and visual retention had a significant difference with the norms, indicating that children with seizure disorder had significant CI and low level of mental abilities compared to their age-related controls.[23] The current study also indicated that ES patients had CI.

A study concluded that there were number of factors that influence cognitive deficits of PNES.[24] The present study also indicated that PNES affected patient's CI. A study on epileptic patients in Rawalpindi, Pakistan, concluded that ES disturbed physical, psychological and social dimensions of patients' life, who had high risk for different psychological or psychiatric problems which included depression, anxiety, mania and other social problems related to life.[25] It was also found that ES patients had high level of psychological distress compared to the control group.[25] The current study also indicated that epileptic fits affected a patient's psychological dimensions. The current study is the first on the subject done in Jhelum, , and will be helpful for medical professionals, psychiatrists and psychologists though it has its limitations, like a small sample size. Also, it did not explore CI in the context of childhood onset and adult onset seizures, secondary causes of seizures, effects of medications and other causes of CI among ES and PNES patients.

Conclusion

Epileptic patients were found to have more CI than PNES patients. Due to neurological problems, ES patients had more CI compared to PNES patients who had functional problems.

Disclaimer: The text was presented at the International Conference of Applied Psychology on February 8, 2019, at Punjab University, Lahore, Pakistan.

Conflict of Interest: One of the authors signed the institutional review board (IRB) approval statement.

Source of Funding: None.

References

1. Schofield DW. Cognitive deficits. Developmental and Behavioral. [Online] 2016 January 20 [cited 2019 January 18]. Available from: URL: https://emedicine.medscape.com/article/917629-overview.
2. Salmon, D. Advances in research on mild cognitive impairment. Shiley-Macros Alzheimer's Disease Research Centre. [Online] 2012 [cited 2020 February 21]. Available from: URL: http://adrc.ucsd.edu/newsletter/Currents/Currents_Spring_12.pdf.
3. Rajan KB, Aggarwal NT, Wilson RS, Everson-Rose SA, Evans DA. Association of cognitive functioning, incident stroke and mortality in older adults. J Am Heart Assoc 2014; 45: 2563-7.
4. Sharbafshaaer M. Impact of cognitive impairment for different levels and causes of traumatic brain injury, and education status in TBI patients. Dement Neuropsychol 2018; 12: 415-20.
5. Trivedi JK. Cognitive deficits in psychiatric disorders: Current status. Indian J Psychiatry 2006; 48: 10-20.
6. Aniol VA, Guekht AB, Gulyaeva NV. Single seizure and cognition: Clinical and translational implications. ARC J Neurosci 2016; 1: 4-18.
7. Xiang X, Fang J, Guo Y. Differential diagnosis between epileptic seizures and psychogenic non-epileptic seizures based on semiology. Acta Epileptologica 2019; 1: 6.
8. Columbia University Irving Medical Center. Epilepsy and seizures.[Online] 2019 [cited 2020 February 21]. Available from: URL: http://www.columbianeurology.org/neurology/staywell/document.php?id=33912.

9. Siddiqui DF. 1.52M people suffer from epilepsy in Pakistan. The Pakistan Time. [Online] 2014 March 25[cited 2019 January 19]. Available from: URL: https://news.pakistantimes.com/2014/03/25/1-52m-people-suffer-from-epilepsy-in-pakistan-292217.html.
10. Fisher RS, Van Emde Boas W, Blume W, Elger C, Genton P, Lee P, et al. Epileptic seizures and epilepsy: Definitions proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE). Epilepsia 2005; 46: 470-2.
11. Dworetzky BA, Weisholtz DS, Perez DL, Baslet G. A clinically oriented perspective on psychogenic nonepileptic seizure–related emergencies. Clin EEG Neurosci 2015; 46: 26–33.
12. Najam D. Conversion disorder on the rise among women in Pakistan. News Lens. [Online] 2015 November 2[cited 2019 January 19]. Available from: URL: http://www.newslens.pk/conversion-disorder-on-the-rise-among-women-in-pakistan/.
13. Drane DL, Williamson DJ, Stroup ES, Holmes MD, Jung M, Koerner E, et al. Cognitive impairment is not equal in patients with epileptic and psychogenic non-epileptic seizures. Epilepsia 2006; 47: 1879-86.
14. Çelik AO, Kurt P, Yener G, Alkin T, Oztura I, Baklan B. Comparison of cognitive impairment between patients having epilepsy and psychogenic nonepileptic seizures. Arch Neuropsychiatry 2015; 52: 163-8.
15. Caplan R, Siddarth P, Stahl L, Lanphier E, Vona P, Gurbani S, et al. Childhood absence epilepsy: behavioral, cognitive, and linguistic comorbidities. Epilepsia 2008; 49: 1838-46.
16. Berg AT, Zelko FA, Levy SR, Testa FM. Age at onset of epilepsy, pharmacoresistance, and cognitive outcomes. Neurology 2012; 79: 1384–91.
17. Tabert MH, Manly JJ, Liu X, Pelton, GH, Rosenblum S, Jacobs M, et al. Neuropsychological prediction of conversion to alzheimer disease in patients with mild cognitive impairment. Arch Gen Psychiatry 2006; 63: 916-24.
18. Alsaadi T, Shahrour TM. Psychogenic nonepileptic seizures: Diagnostic challenges and treatment dilemmas. Int J Neurol Neurother 2015 12; 2: 1-7.
19. American Psychological Association. Diagnostic and statistical manual of mental disorders. 5th ed. USA: American Psychological Association; 2013.
20. Brannigan GG, Decker SL. Bender visual-motor gestalt test. 2nd ed. Itasca, IL: Riverside Publishing; 2003.
21. Shaw MC, Cruickshank WM. The use of the bender gestalt test with epileptic children. J Clin Psychol 1956; 12: 192-3.
22. Aziz H, GuvenerA, Akhtar SW, Hasan KZ. Comparative epidemiology of epilepsy in Pakistan and Turkey: Population-based studies using identical protocols. Epilepsia 1997; 38: 716-22.
23. Nehra A, Tripathi M, Bhatia R, Srivastava MVP, Singh MB, Chopra S, et al. Is epilepsy a cause of cognitive decline in developing brain. Act Nerv Super 2013; 55: 112-7.
24. Willment K, Hill M, Baslet G, Loring DW. Cognitive impairment and evaluation in psychogenic nonepileptic seizures: An integrated cognitive-emotional approach. Clin EEG Neurosci 2015; 46: 42–53.
25. Sahar N. Assessment of Psychological Distress in Epilepsy Perspective from Pakistan. Epilepsy Res Treat. 2012; 2012: 171725