Seizure 22 (2013) 542–547

Contents lists available at SciVerse ScienceDirect

Seizure

journal homepage: www.elsevier.com/locate/yseiz

Impact of a family history of epilepsy on the diagnosis of epilepsy in southern Saudi Arabia

Fawzi A. Babtain [a,b,*]

[a] College of Medicine, Department of Internal Medicine, King Khalid University, Abha, Saudi Arabia
[b] Division of Neurology, Department of Internal Medicine, Aseer Central Hospital, Abha, Saudi Arabia

ARTICLE INFO

Article history:
Received 23 November 2012
Received in revised form 2 April 2013
Accepted 2 April 2013

Keywords:
Epilepsy
Risk factors
Family history
Idiopathic
Generalized
Abnormal EEG

ABSTRACT

Purpose: Epilepsy can develop at any age for reasons that remain poorly understood. The aim of this study was to determine the impact of a family history of epilepsy (FHE) on the incidence and recurrence of seizures.

Methods: This retrospective study was conducted in Aseer central hospital, Abha, Saudi Arabia between January and June 2012. The medical records of 420 patients were analyzed to test the impact of FHE on the risk factors, etiology and diagnosis of epilepsy determined by magnetic resonance imaging (MRI) and electroencephalography (EEG).

Results: 420 patients were studied. Idiopathic epilepsy was seen in 140 patients (33%), symptomatic in 152 (36%), and cryptogenic in 128 patients (30%). FHE was seen in 113 patients (27%), which was associated with younger at the disease onset (15 years vs 20 years, $p < 0.05$). Idiopathic epilepsy was seen more in patients with FHE (43% vs 30%, p value <0.05), and generalized seizures (primary or secondary) were also seen more in patients with FHE (51% vs 36%, p value <0.05). Abnormal EEG was also seen more in patients with FHE (79% vs 66%, $p < 0.05$). Multivariate regression analysis showed that temporal epileptic discharges were the best predictor for the presence of FHE ($p < 0.05$, OR = 3.1, 95% CI 1.7–5.8), more than idiopathic epilepsy or younger age at epilepsy onset.

Conclusions: FHE has a significant impact on epilepsy, its classifications, and the EEG findings, and may underlie the presence of a genetic etiology, which could be related to a high incidence of consanguinity seen in our population. Temporal epileptic discharges were the best predictor for FHE, which may suggest the presence of familial TLE.

1. Introduction

Epilepsy is the most common neurological condition, affecting more than 50 million people in the world, with a 3% risk of developing epilepsy across all ages.[1,2] The etiologic categories include symptomatic, cryptogenic and idiopathic. Whereas symptomatic epilepsies are caused by a brain insult, the causes of cryptogenic epilepsies remain elusive. On the other hand, idiopathic epilepsies are predominantly genetic with early onset during childhood. Recent progress in genetic analysis revealed that most forms of epilepsy result from a combination of genetic and acquired factors, where predominantly genetic epilepsies account for a small fraction of all seizure disorders.[3–5] For this reason, it is increasingly important to understand the impact of genetic factors on the risk factors and symptoms to ensure that proper diagnostic and treatments are provided to these patients.

The first step in the diagnosis of idiopathic epilepsy is a questionnaire establishing the family history of epilepsy (FHE) on these patients.[6] Cases of seizures among the first-degree relatives are usually a strong indicator of predominantly genetic epilepsies. Incidentally, the presence of FHE was associated with an increase in the risk of seizure recurrence after a single seizure or a febrile convulsion.[7–9] Yet, the impact of FHE on epilepsy classifications, etiology, patients' demographics and epilepsy investigations remains unclear and probably complex because of the heterogeneity of epilepsy. Certainly, there are no studies available to evaluate the epilepsy risk factors in the southern part of Saudi Arabia, and the role of FHE in particular.

The aim of this study is to evaluate the impact of FHE on patients with epilepsy, which would further enhance understanding epilepsy pathogenesis and etiologies in these patients.

* Correspondence address: College of Medicine, Department of Internal Medicine, King Khalid University, P.O. Box 641, Abha 61421, Saudi Arabia.
Tel.: +966 7 2417578; fax: +966 7 2418111.
E-mail address: Fawzi.babtain@yahoo.com

1059-1311/$ – see front matter © 2013 British Epilepsy Association. Published by Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.seizure.2013.04.002

2. Methods

This is a retrospective study done in Asser central hospital, in Abha, Saudi Arabia, which is the main regional hospital in Aseer region, with a capture area of around 1.9 million people. This study was conducted between January and June of 2012, using our hospital's epilepsy registry, which contains data from all patients diagnosed with epilepsy who were evaluated in the hospital. The patients included in this study: (a) were 15 years and older, (b) had at least one surface electro-encephalogram (EEG), (c) had a high resolution magnetic resonance imaging of the brain (MRI) of 1.5 T performed in patients with suspected localization related or unclassified epilepsies, and (d) data on family history of epilepsy is obtained. Patients' gender, age at the diagnosis, and age at epilepsy onset were also determined according to the registry, and epilepsy risk factors were identified. According to the protocol followed in our hospital, each patients should be assessed by an adult neurologist to obtained detailed history and perform the neurological examinations, followed by a routine EEG and a high resolution MRI of the brain using epilepsy protocols, with/without gadolinium use. Epilepsy risk factors reported in the literature were determined in our population,[10,11] and a radiologist reviewed the MRI of the brain for the studied patients.

The age at epilepsy onset, defined as the age at the first seizure, and the age at the diagnosis were determined. Epilepsy was classified according to etiology into idiopathic, symptomatic and cryptogenic, using the International Classification of Seizures (ICES) and Epilepsies.[12] Clinical data obtained by medical history, along with EEG and MRI results were used to classify epilepsy into generalized, focal, or unclassified (or unknown). Furthermore, those with unclassified epilepsy should have 2 or more EEG, one of which would be a sleep-deprived, aiming to further classify their epilepsy type. In addition to the clinical history taking, a separate questionnaire sheet to be filled out for each patient to document the age at first seizure, age at the diagnosis, the presence of FHE, number of family members affected, parental consanguinity and the degree of consanguinity. Patients with FHE had to go through a further enquiry in the presence of patient's relative attending the clinic to ensure the validity of this information. FHE was identified as the presence of history of epilepsy in parents, brothers, sisters or siblings, or a second degree relative in patients with parental consanguinity. Those patients with FHE were identified, and their clinical, electrical and radiological data, as well as epilepsy classifications were compared to those with no FHE.

3. Data analysis

Contingency tables and Fisher exact test were used for statistical analysis (χ^2 test for categorical variables), and Student's *t*-test were used for continuous variables, and *p* value of <0.05 was considered significant. Multivariate regression analysis was performed (binary logistic regression) to predict the variables associated with the presence of family history of epilepsy. These factors were; the age at epilepsy onset, the gender, epilepsy classification according to etiology, MRI and EEG findings. Because of multiple testing was done, Bonferroni adjustment was performed, and the adjusted *p* value of <0.00625 was used to determine the significance for the tested factors in the regression analysis. The odds ratios and 95% CI were obtained. Data analysis was performed using IBM SPSS Statistics for Macintosh, Version 20.0.0, IBM Corp., Armonk, NY.

No consent is required in our hospital to perform retrospective studies.

4. Results

A total of 480 patients were considered for this study. Sixty patients were excluded due to incomplete EEG or MRI documentation preventing adequate epilepsy classification. 420 patients were included in the study, 205 (49%) were men. The mean age at disease onset was 19 years (range: 0–85; SD = 14.7), and the mean age at diagnosis was 27 years (range: 15–85 years; SD 14.1). Epilepsy was found to be idiopathic in 140 patients (33%), symptomatic in 152 (36%), and cryptogenic in 128 patients (30%). According to seizure onset, 196 patients (46%) had partial epilepsy, 169 (40%) had generalized, and unclassified epilepsy was only seen in 55 patients (13%). MRI of the brain was abnormal in 128 patients (30%), and EEG showed epileptic discharges in 293 patients (70%), where it was generalized in 104 patients (25%), and temporal or extra-temporal in 189 patients (45%). Table 1 shows

Table 1
Patient's demographics and risk factors.

	Patients with FHE[a] *N* = 113 (%)	Patients with no FHE *N* = 307 (%)	*p*-Value[b]
Men	50 (44%)	155 (51%)	NS[b]
Mean age at presentation	24 years	28 years	0.026
Mean age at onset	15 years	20 years	0.005
Febrile convulsion	6 (5%)	15 (5%)	NS
Head trauma	2 (2%)	18 (6%)	NS
CNS[c] infection	2 (2%)	10 (3%)	NS
Vascular	7 (6%)	39 (13%)	NS
MCD[d]	2 (2%)	3 (1%)	NS
Other structural lesions	1 (1%)	9 (3%)	NS
Perinatal insults	2 (2%)	17 (6%)	NS
Congenital malformation	3 (3%)	7 (2%)	NS
Abnormal brain MRI[e]	26 (23%)	98 (32%)	NS
Abnormal EEG[f]	89 (79%)	204 (66%)	0.015
Specific EEG abnormalities			
Generalized discharges	38/89 (43%)	66/204 (32%)	NS
Temporal discharges	39/89 (44%)	94/204 (46%)	NS
Extra-temporal discharges	12/89 (13%)	44/204 (22%)	NS

[a] FHE, family history of epilepsy.
[b] NS, non-significant.
[c] CNS; central nervous system.
[d] MCD, Malformation of cortical development.
[e] MRI magnetic resonance imaging.
[f] EEG, electro-enecephalogram.