Epilepsy & Behavior 53 (2015) 37–42

Contents lists available at ScienceDirect

Epilepsy & Behavior

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

Psychiatric disorders among 165 patients with juvenile myoclonic epilepsy in India and association with clinical and sociodemographic variables

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ARTICLE INFO

Article history:
Received 11 July 2015
Revised 11 September 2015
Accepted 19 September 2015
Available online 28 October 2015

Keywords:
Juvenile myoclonic epilepsy
Psychiatric disorders
Depressive disorders
Anxiety disorders
Marital status

ABSTRACT

Objective: The current study evaluated the association between clinical variables and psychiatric disorders (PDs) in patients with juvenile myoclonic epilepsy (JME).

Methods: Consecutive patients with JME who had at least two years of regular follow-up from May 2011 to April 2014 formed the study population. The association between clinical and sociodemographic data with psychiatric evaluation on structured clinical interview and quality of life in epilepsy — 31 (QOLIE-31) was evaluated using logistic regression analysis.

Results: Out of 165 patients in the current study, 77 (46.6%) patients were diagnosed with PDs; while 50 were categorized to having anxiety disorders, 27 patients had depressive disorders. The mean age of the study population was 25.35 ± 7.6 years with 37.52% women. Patients with PDs had lower overall QOLIE score (55.84 ± 13.07 vs 68.70 ± 11.23, $p < 0.001$) and lower social function score (80.95 ± 19.22 vs 91.09 ± 14.74, $p < 0.001$). Being married was the strongest predictor of depressive disorders ($\beta = 8.59$; 95% CI, 1.44–51.28; $p = 0.018$); whereas, lower emotional well-being ($\beta = 0.942$; 95% CI, 0.907–0.978; $p = 0.002$) was the only variable associated with anxiety disorders. Patients with depressive disorders had longer duration of PDs (11.85 ± 8.68 years vs 7.75 ± 6.70 years, $p = 0.039$), and a majority of them were married (66.7% vs 26.0%, $p = 0.001$). Patients with depressive disorders scored low on emotional well-being (50.81 ± 14.62 vs 61.02 ± 13.05, $p = 0.002$), energy levels (52.78 ± 11.71 vs 62.80 ± 10.84, $p < 0.001$), and social function (70.96 ± 20.69 vs 86.34 ± 16.16, $p = 0.001$). Depressive disorders were more prevalent among married patients above 35 years of age (5.2% vs 36.8%, $p = 0.042$).

Significance: Nearly half of the patients with JME had coexisting PDs. The psychological profile of anxiety disorders was different from depressive disorders in patients with JME. Depressive disorders were more prevalent among older patients with JME, and marriage was strongly associated with depressive disorders.

1. Introduction

Juvenile myoclonic epilepsy (JME) is an age-related, clinically well-defined idiopathic generalized epilepsy syndrome characterized by myoclonic jerks (MJ), generalized tonic–clonic seizures (GTCS) especially on awakening, and absence seizures in about one-third of the patients [1]. An abnormal behavioral profile in patients with JME was reported as early as 1957 [2]. The prevalence of psychiatric disorders (PDs) in nearly one-third of patients with JME is similar to that reported in patients with temporal lobe epilepsy where psychiatric aspects have been more commonly studied [3]. A high prevalence of PDs has been reported in patients with early onset of seizures (age < 11 years) in comparison with those with a later onset [4]. Patients with JME perform more poorly than those with frontal lobe epilepsy on tests requiring psychomotor speed, abstract reasoning, and concept formation [5].

Personality traits like psychasthenia and instability due to PDs characterize social consequences in patients with JME [6]. In fact, Lund et al. [7] reported "character neurosis" defined as emotional instability, lack of perseverance, and fearful inhibition in a subgroup of patients with JME associated with a feeling of being discriminated, lower income, and need for social assurance. Furthermore, studies have also reported that coexisting PDs make management of patients with JME difficult [8] with reports associating PDs with drug resistance [9,10], higher seizure frequency [11], and worst seizure control [12]. Special attention is, therefore, needed with regard to PDs in the comprehensive management of JME [3].

In recent times, assessment with structured diagnostic instruments like SCID-I and SCID-II allow more accurate classification and quantification of PDs, particularly anxiety and personality disorders [13]. A comprehensive neuropsychological assessment of patients with JME

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http://dx.doi.org/10.1016/j.yebeh.2015.09.024
1525-5050/

revealed executive dysfunction attributable to attention deficits [14]. This improved quantification is helpful in evaluating the association between psychiatric aspects of JME with clinical factors like duration of epilepsy and age of onset of epilepsy. However, there is insufficient research on the influence of clinical factors on PDs, chronological behavior of PDs, and their influence of socioprofessional integration in patients with JME [3]. The current study evaluated the association between clinical variables and PDs with implications on psychosocial integration in patients with JME.

2. Material and methods

The study was part of a larger epilepsy registry, where consecutive patients with JME aged 16 years and above, who had at least two years of regular follow-up at an outpatient department of the epilepsy clinic at the Krishna Institute of Medical Sciences, a tertiary referral center in South India, from May 2011 to April 2014, formed the study population. The diagnosis of JME was based on the International Classification of Epilepsies [1]. Patients with chronic illnesses besides JME and patients with evidence of neurological (or) intellectual deficit secondary to brain hypoxia, metabolic disease, and degenerative diseases were excluded. The study was approved by the institutional ethics committee.

The sociodemographic data collected included details about age, gender, schooling, family income, education, family history of neurological or psychiatric illness, marital status, employment, smoking, and alcohol use. The clinical variables collected were semiology, type of seizures, time of occurrence of GTCS and MJ, duration of epilepsy, age of onset of epilepsy, precipitating factors, family history of epilepsy, and antiepileptic drug (AED) history. The seizure frequency score was assessed at every visit using the Department of Veteran Affairs (VA) seizure type and frequency rating for GTCS [15].

2.1. Psychiatric evaluation

All subjects were evaluated by a clinical psychologist, using International Classification of Psychiatric Disorders (ICD-10), by the structured clinical interview method in which each patient can have more than one psychiatric diagnosis in each axis. For analysis, patients were classified into two major groups (i.e., anxiety disorders or depressive disorders). Patients with anxiety disorders mixed with depressive disorders were grouped under anxiety disorders, and those with schizophrenia were categorized into depressive disorders. The QOLIE-31 questionnaire was used to assess health-related quality of life in the study patients [16]. The QOLIE-31 contains seven subscales which quantify the patient's seizure worry, overall quality of life, emotional well-being, energy/fatigue, cognitive functioning, medication effects, and social functioning on a scale of 0–100 where higher scores reflect a better quality of life. An overall score is obtained by using a weighted average of the subscale scores. Seizure severity and its psychometrics were analyzed using the Liverpool seizure severity scale (LSSS), a 16-point scale, containing 2 subscales: perception of control and ictal/postictal effects [17].

2.2. Statistical analysis

After confirming the homogeneity of the data, the study population was divided into groups based on the presence of PDs, type of PDs, and marital status. While the differences between groups for categorical variables were analyzed using chi-square test, unpaired student t-test was used for continuous variables. All the factors that were significantly different between the groups were tested for association with the type of PD using binary logistic regression analysis. All the statistical analysis was performed using Statistical Package for Social Sciences software version 17.0, IBM Computers, New York, USA. A $p < 0.05$ was considered significant.

3. Results

A total of 165 patients with JME were enrolled in the current study. All the patients had myoclonic jerks, 142 (86%) had GTCS, and absence seizures were reported in 46 (27.9%) patients. Febrile seizures were reported in 27 (16.3%) patients. The optimum AED dose (maximum tolerated dose according to body weight) was administered in all the patients. Valproic acid was taken by 132 patients while 22 received lamotrigine and 10 were given levetiracetam. The other AEDs used were topiramate in six, and clobazam in 28 patients as the seizure control was not optimum in spite of one AED. Seizures were well-controlled in 127 (76.9%) patients who were seizure-free for at least two or more years.

Seventy-seven (46.6%) patients were diagnosed with PDs in the entire cohort of 165 patients. Among the 77 patients with JME with PDs, 50 were categorized to having anxiety disorders which included six patients with mixed anxiety and depressive disorders; 27 patients with JME had depressive disorders which included one patient with schizophrenia. The mean age of the study population was 25.35 ± 7.6 (range 16 to 54) years. While 62 (37.52%) were women, an equal number were married at enrolment into the study.

3.1. Patient characteristics and PDs

There were no significant differences between the patients with or without PDs for mean age (25.88 ± 7.51 years vs 24.83 ± 7.70 years, $p = 0.377$), female gender (36.4% vs 38.6%, $p = 0.872$), and fraction of patients with graduate education (40.0% vs 40.9%, $p = 1.000$). Both groups were similar for duration of epilepsy (9.19 ± 7.65 years vs 8.74 ± 6.98 years, $p = 0.692$), seizure scores (4.45 ± 2.44 vs 4.33 ± 2.13, $p = 0.726$), and percentage of those who were married (40.3% vs 35.2%, $p = 0.523$). However, patients with PDs had lower overall QOLIE score (55.84 ± 13.07 vs 68.70 ± 11.23, $p < 0.001$), lower emotional well-being (57.44 ± 14.38 vs 76.43 ± 10.93, $p < 0.001$), and lower social function score (80.95 ± 19.22 vs 91.09 ± 14.74, $p < 0.001$). The differences between patients with PDs and those without PDs are summarized in Table 1.

3.2. Patient characteristics and depressive disorders

Upon comparison of patients with depressive disorders ($n = 27$) with those who had no PDs ($n = 88$), patients with depressive disorders were older (30.11 ± 9.37 years vs 24.83 7.70 years, $p = 0.004$) and had longer duration of epilepsy (11.85 ± 8.68 years vs 8.74 ± 6.97 years, $p = 0.055$), and a majority of them were married (66.7% vs 35.2%, $p = 0.007$). On the psychological assessment, patients with depressive disorders scored low on emotional well-being (50.81 ± 14.62 vs 76.43 ± 10.93, $p < 0.001$), cognitive function (60.96 ± 24.89 vs 82.00 ± 18.90, $p < 0.001$), energy levels (52.78 ± 11.71 vs 67.98 ± 15.33, $p < 0.001$), lack of seizure worry (60.18 ± 21.11 vs 79.89 ± 19.03, $p = 0.004$), and social function (70.96 ± 20.69 vs 91.09 ± 14.74, $p < 0.001$). The differences between groups based on depressive disorders are summarized in Table 2. On further analysis on factors associated with depressive disorders, being married was the strongest predictor of depressive disorders ($\beta = 8.59$; 95% CI, 1.44–51.28; $p = 0.018$) with contributions from lower QOLIE score ($\beta = 0.906$; 95% CI, 0.843–0.973; $p = 0.007$), lower emotional well-being ($\beta = 0.920$; 95% CI, 0.866–0.978; $p = 0.008$), and lower social function ($\beta = 0.938$; 95% CI, 0.901–0.977; $p = 0.002$).

3.3. Patient characteristics and anxiety disorders

Upon comparison of patients with anxiety disorders ($n = 50$) with those who had no PDs ($n = 88$), there were no differences between the groups for mean age (23.60 ± 5.07 years vs 24.83 7.70 years, $p = 0.314$), duration of epilepsy (7.75 ± 6.70 years vs 8.74 ± 6.97 years,