Profile of Epilepsy in a Regional Hospital in Al Qassim, Saudi Arabia

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Abstract:

Introduction: Epilepsy is a diverse set of chronic neurological disorders characterized by seizures. It is one of the most common of the serious neurological disorders. About 3% of people will be diagnosed with epilepsy at some time in their lives.

Objectives: We aimed to address the commonest types of seizures, their aetiologies , EEG and neuroimaging results and prognosis of patients presented to neurology services of the King Fahad Specialist Hospital- AlQassim (KFSH).

Methodology: In this retrospective epidemiological study we investigated the medical records of patients with epilepsy, who attended the neurology services of KFSH, during the study period (26/10/2011-26/4/2012).

Results: The study included 341 patients; 189 (55.4%) males and 152 (44.6%) females. Their ages ranged between 12 and 85 years (mean ± SD = 31±16.9).The majority of patients had Generalised Tonic Clonic Seizures (76.2%), followed by Complex Partial Seizures (7.6%). 73% of our patients had idiopathic epilepsy. The commonest causes for symptomatic epilepsy were Cerebro Vascular Accidents and Head trauma. Hemiplegia, mental retardation and psychiatric illness were the commonest comorbidity. 69.3% of patients had controlled seizures. Patients with idiopathic epilepsy were significantly controlled than patients with symptomatic epilepsy (P=0.01), and those using one Anti Epileptic Drug were significantly controlled compared to patients using polytherapy (P=0.0001) there was no significant relation between controlled seizure and duration of illness or hospitalization or EEG changes.

Conclusion: Seizure types, aetiology, drug therapy, Comorbidities and outcome in a tertiary care hospital in Saudi Arabia are similar to previous local and international studies. 35.3% of patients were hospitalized, higher rates than previous studies. Seizure control was better in generalized seizures and idiopathic epilepsy compared to complex partial seizures or partial seizures with secondary generalization and symptomatic epilepsy.

Key Words: seizures; epilepsy; epidemiology; Saudi Arabia

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Introduction:

A seizure represents the clinical manifestation of an abnormal excessive synchronization of discharges from neurons residing primarily in the cerebral cortex. This abnormal paroxysmal activity is intermittent and usually self-limited, lasting seconds to a few minutes. Epilepsy is the increase tendency, or reduced threshold to have recurrent seizures.

Epilepsy is a brain disorder characterized by episodes of disturbed brain activity (seizures) affecting the patient's attention and behavior. [1] It is not a specific disease, but rather a heterogeneous condition arising from a variety of pathological insults involving the cortex, such as tumors or genetic channelopathies

The estimated median prevalence of epilepsy in Arab countries (Sudan, Libya, and Tunisia) is 2.3/1,000 (varying from 0.9–6.5/1,000), which is just within the range found in Europe, North America, Australia, and Asia. [2, 3] In Saudi Arabia prevalence for active epilepsy was 6.54 /1000 population. [4]

Most studies of epilepsy indicate that males are more frequently affected than females, generalized seizures to be more common than partial seizures and that Idiopathic epilepsy represent 73.5–82.6% of cases. [5]

Objectives

This retrospective descriptive study was planned to address the commonest types of seizures, EEG and neuroimaging studies results, frequently used Antiepileptic drugs and degree of seizure control in patients presented to the King Fahad Specialist Hospital-Buraidah (KFSH) neurology service. Furthermore to assess, whether these variables are in agreement with other local and international studies?

Subjects and Methods:

Medical records of all patients with epilepsy, who attended neurology services of KFSH, during the study period (26/10/2011-26/4/2012), were investigated. KFSH is the only tertiary care hospital in AlQassim region. The study included adult patients of both sexes with epilepsy who attended the neurology services either at outpatient clinics or were admitted to inpatient wards.

Epilepsy was defined as: two or more unprovoked seizures. Seizures were classified according to ILAE, 1981 classification. [6]

Exclusion criteria:

*Provoked seizures e.g. due to hypoglycemia, hyperglycemia and hyponatraemia…..etc.

*Patients with 1st seizure whose follow up did not show any subsequent seizures.

Collected data included; demographic data, analysis of seizures types, etiologies, results of EEG and neuroimaging, chemical and hematological laboratory studies and also the use of antiepileptic drugs, patient's compliance and extent of seizure control. Approval to conduct this study was obtained from the local ethical committee.

Statistical Analysis: The advanced statistical package for social science [SPSS] for MS windows (version 19.0) was utilized to perform the statistical analysis for the study. Simple descriptive statistical tests (Mean and Standard deviation) were used to describe the numerical values of the sample while qualitative data were presented by frequency distribution. To test the 2- tailed significance of differences in means, Student t-test for independent samples for 2 groups was used. Chi square test was used to determine the relation between two variables. A probability of (P) ≤0.05 was accepted as significant.

Results

This study included records of 341 patients with epilepsy who attended neurology services as out patients or had admissions to the medical wards and ICU of KFSH-Buraidah, during the study period (26/10/2011-22/4/2012).

Their ages ranged between 12 and 85 years (mean ± SD = 31±16.9).189 (55.4%) of the study population were males and 152 (44.6%) were females and there was no significant difference between mean age of males and females.

Age of onset of epilepsy ranged between 2 and 82 years old (mean±Sd=24.5±17.2). The duration of epilepsy ranged between 1 and 41 years (Mean ± SD = 6.97±6.2).

The majority of patients had Generalised Tonic Clonic Seizures (76.2%), followed by Complex Partial Seizures (7.6%) as shown in Table (1).

Table 1: Frequencies of seizure types.

Seizure Type	Frequency	Percent
Generalised: -GTCS	260	76.2%
-Absence	4	1.2%
-Myoclonic	12	3.5%
-Tonic	1	0.3%
Partial: -CPS	26	7.6%
-Simple Focal	16	4.7%
Others: -Syncope	9	2.6%
-PNES	6	1.8%
-Multiple types of seizures	7	2.1%
Total	341	100%

GTCS= Generalised Tonic Clonic Seizures, CPS= Complex Partial Seizures, PNES= psychogenic non epileptic seizure

9 Patients diagnosed to have syncope (2.6%) and 6 psychogenic non epileptic seizure (1.8%), were excluded from further statistics and their results will be discussed separately.

Out of remaining 326 patients with true seizures, 180 males (55.2%) and 146 females (44.8%), 73% had idiopathic epilepsy. Table (2) shows causes of seizures in these patients.

Table 2: Aetiologies of epilepsy.

Etiology	Frequency	Percent
Idiopathic	238	73.0%
CVA	38	11.7%
Head injury	23	7.1%
Cerebral Palsy	11	3.4%
SOL	5	1.5%
CNS infection	5	1.5%
MS	2	0.6%
Alcohol	2	0.6%
ESRD	1	0.3%
Hydrocephalus	1	0.3%
Total	326	100%

CVA: Cerebro Vascular Accident, MS: Multiple Sclerosis, SOL: Space Occupying Lesions, ESRD: End Stage Renal Disease.

The data regarding family history of epilepsy was not available in most of the patients. Only 39 patients had documented family history, 12 of these patients had first degree relatives with epilepsy.

58.9% of our patients had no co-morbid medical or neurological disorders. Hemiplegia was 12.9% followed by mental retardation 10.4%, amongst the co-morbidities as shown in Table (3).

Table 3: Co-morbidities.

Co-morbidity	frequency	Percent
None	192	58.9%
Hemiplegia	42	12.9%
Mental retardation	34	10.4%
Psychiatric disorder	16	4.9%
Ataxia	7	2.1%
Migraine	5	1.5%
Cardiac disease	4	1.2%
Bone disease	4	1.2%
Hypothyroidism	4	1.2%
Pregnancy	4	1.2%
Blood disease	3	0.9%
Obesity	3	0.9%
Spastic paraplegia	2	0.6%
Liver disease	2	0.6%
MS	2	0.6%
Hypocalcaemia	1	0.3%
ESRD	1	0.3%
total	326	100%

Co-morbid psychiatric disorders were found in 18 patients, 9 had personality changes, 4 had depression, 2 had anxiety and 1 patient with conduct disorder. Cardiac diseases included Ischaemic Heart Disease (IHD) in 3 and Ventricular Septal Defect (VSD) in 1 patient respectively. Bone diseases included 2 lumbar spine degeneration, one fracture nose and one congenital bone deformity. Blood diseases were found in 3 patients; 2 had polycythaemia and one patient with Idiopathic Thrombocytopenic Purpura (ITP).

115 patients (35.3%) were admitted to the hospital for uncontrolled seizures; 9 of them (2.8%) were diagnosed and treated as status epilepticus.

EEG data were available in 278 patients. The following EEG results represent the first EEG study done for the patient; 64 (19.6%) had normal records, 57 (17.5%) had non-specific EEG changes while 157 (48.2%) had epileptiform discharges.

Epileptiform EEG discharges were (localized) to the right side in 13 patients, left sided in 9 patients and generalized in 135 patients.

193 patients (59.2%) had brain CT and/or MRI, 111 (34.0%) were normal. CVA and encephalomalacia were among the commonest radiological findings as shown in Table (4).

Table 4: Neuroimaging data:

Imaging Findings	frequency	Percent
No available data	133	40.8%
Normal	111	34.0%
CVA	34	10.4%
Encephalomalacia	20	6.1%
Brain atrophy	15	4.6%
SOL	7	2.1
Mesial Temporal sclerosis	3	0.9%
MS	2	0.6%
AVM	1	0.3%
total	326	100%

CVA: Cerebro Vascular Accident, MS: Multiple Sclerosis, SOL: Space Occupying Lesions, AVM: Arterio Venous Malformation.

242 patients were on monotherapy (74.2%) and 84 (25.8%) were using more than one antiepileptic drug. The most frequently used antiepileptic drug was Carbamazepine; in 146 patients either alone or in combination , followed by Valproate in 106, phenytoin 55, Topiramate 46, Lamotrigine 28, Clonazepam 23, Levetiracetam 10 and Phenobarbitone in 9 patients.

226 patients (69.3%) were seizure free during the last one year, while 100 (30.7%) had breakthrough seizure.

56 patients (17.2%) had a trial for drug withdrawal, of these 48 had recurrence of their seizure; 34 males and 12 females their mean age of onset and duration of epilepsy were not significantly different from other patients.

Patients with idiopathic epilepsy had significantly better control than patients with symptomatic epilepsy (P=0.01), also those using one AED had significantly better control compared to patients using polytherapy (P<0.0001). There was no significant relation between seizure control and the duration of illness or hospitalization.

7 (2.1%) patients had more than one seizure type; 4 were males and 3 females, age range was 17-38years, duration of illness was 12-33 years. Only 2 of them had controlled seizures, only one had normal EEG, one had a SOL and 3 of them were on polytherapy.

4 (1.2%) patients had pregnancies during their course of illness, age range 26-40 years, 2 were on Carbamazepine and other 2 were on Lamotrigine, all had normal delivery with healthy babies.

Thirty four patients (10.9%) were mentally retarded; 22 males (64.7%) and 12 females (35.3%). Their ages ranged between 13 and 42 years (mean ± SD =21.2±6.3). 28 of them (82.4%) had GTCS, 3 had CPS, 2 had simple motor focal seizures and one with multiple seizure types. Seven of these patients had cerebral palsy and one had hydrocephalus. Amongst them, only one had normal EEG, 5 non-specific changes and 25 with epileptiform discharges. Neuroimaging results were available for 18 of the 34; 9 had normal studies, 4 had brain atrophy, 2 encephalomalacia, 2 arachnoid cysts and one hippocampal sclerosis respectively. 7 of these 34 patients had history of hospitalization, 2 had status epilepticus and ICU admission. 17 patients have had uncontrolled epilepsy and a similar number were on polytherapy. Trial of drug withdrawal was done in three of these patients, which failed in all three.

There were 6 patients (1.8%) with psychogenic non epileptic seizures, all females, age range 17-27 years (mean±Sd=21.6±4.8) all of them had normal EEG and neuroimaging, only one was on Valproate as mood stabilizing drug and was diagnosed as borderline personality disorder.

9 (2.6%) patients were diagnosed as having syncope rather than seizures. All were males, age range 12-52 (mean ± SD=29.0±13.6) and all of them had normal EEG and neuroimaging.

Discussion

Most studies of epilepsy in industrialized countries indicate that males are more frequently affected than females, although the difference is seldom statistically significant. [5] Results from both hospital-based and population-based studies in developing countries are similar, [7-11] reaching significance in the Saudi study. On the other hand, studies in Nigeria [12] and Jordan [13] have found higher prevalence for females.

All though this study was not aimed to measure the gender differences in prevalence, more male patients had attended the hospital. 189 (55.4%) of the study population were males and 152 (44.6%) were females, which is statistically insignificant.

Most of patients had GTCS (76.2%). this is in agreement with studies from the Arab countries which had found generalized seizures to be more common than partial seizures, [11] matching Asian and Sub-Saharan African studies [14,15] and other studies as well. [16, 17]

But contrasting with some studies, which reported partial seizures to be more common in both children and adults, [4, 5, 18] it appears likely that partial seizures with secondary generalization have been misclassified as primary generalized seizures, due to short-lived focal events.

73% of our patients had idiopathic epilepsy. Stroke, head injury and cerebral palsy were the commonest causes for symptomatic epilepsy. History of febrile convulsions was reported in few patients as young patients are usually transferred from Pediatric Hospital at age of 12 without full report.

Many studies have reported, Idiopathic epilepsy to represent 73.5–82.6% of cases, and early childhood brain damage such as in cerebral palsy, mental retardation, and congenital and hereditary diseases were the major cause of symptomatic epilepsy. [4, 10]

Infection was considered the main cause in Southern Sudan. [19] Other causes include head injuries; intracranial infections, tumors, Cerebrovascular disease, febrile seizures toxic and metabolic disorders including alcohol. [3, 5, 20] Hippocampal sclerosis is the most common lesion in adult patients referred to epilepsy surgery centers for refractory partial seizures of temporal lobe origin. [21]

In Alrajeh study, [4] epilepsy was symptomatic in 32% of the cases including: pre or perinatal encephalopathy, head injury, childhood neurological infection and stroke.
Genetic factors are thought to underlie epilepsy in many cases. [22] In developing countries, consanguineous marriage is relatively common, which is more likely to increase the risk of seizure disorders in the offsprings. Many studies found family history of epilepsy to be positive in around 20% of patients. [11, 23]

In the records of the patients we studied, the data regarding consanguineous marriage and positive family history of epilepsy was lacking in most of the cases. Only 39 had documented family history, 12 out of these patients had first degree relatives with epilepsy.

In our study thirty four patients (10.9%) were mentally retarded. This is lower than Rantanen's study on children with epilepsy, [24] which reported that Cognitive function was mildly retarded in 22%, and moderately to severely retarded in 28%. This difference can be attributed to inclusion of mild cognitive impairment.

17 of the mentally retarded patients were using polytherapy, the general opinion represented in the literature claims that all AEDs can compromise cognitive functioning. The risk of cognitive side effects increases with polytherapy. [25, 26]

Evidence from clinical and basic investigations indicates that aspects of cerebral dysfunction associated with a lowered seizure threshold may also predispose toward other disorders such as depression, cognitive impairment, sleep disorders, and migraine. Poor fitness and obesity are also reported at higher rates in epilepsy. Some co morbid conditions in epilepsy, such a depression and anxiety, may have a greater influence on subjective health status than does seizure rate. [27, 28]

16 of our patients had psychiatric disorders; 9 had personality changes, 4 were depressed, 2 with anxiety and one with conduct disorder, all were under psychiatrist follow up.

Hospitalizations for epilepsy represent a potentially preventable complication of this condition. The findings in this study indicate that, 35.3% of patients were hospitalized. These rates are higher than previous studies showing that approximately 8% of persons with epilepsy are hospitalized each year. [29] While more recent study revealed that hospital stays with epilepsy as the principal cause have increased. Epilepsy experts speculated that more elective admissions for evaluation and an increasing elderly population who may need more intensive care might explain the trend. [30] Nine patients had status epilepticus (SE) during the study period. Incidence of SE is around 18.3-27.2 per 100,000 population. SE incidence was U-shaped, peaking under 1 year and over 60 years of age, greater for males than for females, for acute symptomatic etiology than any other etiology, and for partial SE that did not generalize than any other seizure type as shown in other studies. [31, 32]

Of 278 EEG records; 64 (19.6%) had normal records, 57 (17.5%) had non-specific EEG changes while 157 (48.2%) had epileptiform discharges. These results are in agreement with other studies that found abnormal interictal EEG records in around 80% of patients. [11, 23]

226 patients (69.3%) were seizure free during the last one year. This is in agreement with previous studies that found an overall prognosis for seizure control to be good and over 70% will enter remission. [3, 33] Epilepsy carries an increased risk of premature death particularly in patients with chronic epilepsy. Sudden unexpected death has been increasingly recognized as a major culprit for this increased mortality. [3] In our sample one patient died but actual cause of death couldn't be traced.

74.2% of patients were on monotherapy. The most frequently used antiepileptic drug was carbamazepine either alone or in

combination, followed by Valproate, phenytoin, topamax, Lamotrigine, Clonazepam, Levitiracetam and Phenobarbitone. Almost all patients were compliant with medications. 25.8% were on polytherapy which in agreement with Cockrel [34] who reported that about 50-70% of newly diagnosed patients with epilepsy become controlled with monotherapy, 30% needs polytherapy become refractory to monotherapy.

56 patients had a trial for drug withdrawal, of these 48 had recurrence of their seizure. This is higher than previous studies that found the recurrence risk in the next 12 months to be 30% [35] and 41% by 2 years [33] which can be explained by the fact that many patients stop drugs suddenly by themselves.

Non-epileptic events have been recognized since ancient times. The prevalence of psychogenic non-epileptic seizures is difficult to estimate. Literature reviews indicate that the percentage of patients referred to epilepsy centers that are psychogenic non-epileptic seizures: 10–20%. (36). In this study 6 patients (all females) were diagnosed as psychogenic non epileptic seizures.

Syncope is the most common "non-epileptic" cause of altered consciousness. The two main types are reflex (vasovagal) and orthostatic syncope. [37] Zaidi et al [38] studied a group of patients who were previously diagnosed as epilepsy with continued attacks despite adequate anticonvulsant drug treatment. An alternative diagnosis was found 25.7% of patients who developed profound hypotension or bradycardia during the head-up tilt test, confirming the diagnosis of vasovagal syncope. In our study 9 patients (2.6%) were diagnosed as having syncope, all males, mean age 29.0 and all of them had normal EEG and neuroimaging.

Conclusion

The majority of patients had GTCS and idiopathic epilepsy. The commonest causes for symptomatic epilepsy were CVA and Head trauma. Two thirds of patients had controlled seizures, while one third had poor control. Patients with idiopathic epilepsy and those using one AED were significantly controlled compared to patients with symptomatic epilepsy and polytherapy. There was no significant relation between seizure control, duration of illness and EEG changes. 35.3% of patients were hospitalized; these rates are higher than previous studies

The proportion of patients with uncontrolled seizures was significant; no data of referral to the higher centers for possible epilepsy surgery was available in their records. As we know that various neurosurgical interventions, like resection surgeries and vagal and deep brain stimulation can achieve better seizure control in intractable epilepsies. [39] Timely diagnosis of intractable epilepsy and referral to the higher centers for possible neurosurgical interventions can improve the control of seizures and outcome in these patients.

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