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Driving Eligibility among Epilepsy Patients in Saudi Arabia

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ABSTRACT

Background: epilepsy is prevalent neurological disorder in Saudi Arabia and listed as temporary or permanent driving interdiction. In line with other countries rules and requirements, would be safer, for the patient and community, if the seizures are controlled (Seizure free remission) for about 12 months prior to granting unlimitSed driving license.

Objective: to evaluate the eligibility of male epileptic patients aging more than 18 years old to drive cars based on achieving one year seizure free remission in a statistically representative sample for Saudi population.

Subjects and methods: a cross sectional study design in which eligible patients attending hospitals in Saudi Arabia were requested to take part in a survey about their driving status. Sample size was calculated assuming that one-year seizure free remission of 80% based on literature review, with a precision of ± 5.9%. A sample size of 170 individuals was sufficient to perform 2-tailed test with 95% confidence level.

Results: 170 consenting patients participated in the survey. The mean age was 38.7 (range 18-90 years). Seizure types encountered were generalized tonic-clonic seizure 98 patients (57.6%), Absence 27 patients (15.9%), unclassified 26 patients (15.3%) and clonic 14 patients (8.2%). The dominant underlying etiology was idiopathic in 90.6%. Despite that only 106 patients (62.4%) achieved one year seizure free remission, 161 patients (94.7%) hold a valid driving license and 146 patients (85.9%) are currently driving. 35 patients (20.6%) reported experiencing seizure while driving and 46 patients (27.1%) received advices from healthcare professionals regarding driving.

Conclusion: Among our study population, relatively lower control of epilepsy was observed with increased risk of seizures during driving that may lead to serious consequences. Health education regarding driving especially for uncontrolled patients is a key area for improvement till achieving higher seizure remission rate.

KEYWORDS: Epilepsy; Driving; Saudi Arabia

INTRODUCTION

Epidemiologic studies on epilepsy show wide variations in prevalence rates (PRs) from 0.9 to 57 per 1000 population [1-7]. The noticeable variability in the reported prevalence rates across the globe is a result of many factors such as diagnostic accuracy, level of case ascertainment, selection criteria, tool used, and people selection. In 1982, the world health organization (WHO) published its protocol for epidemiological research of neurological illnesses in emerging countries [8], which has been an advance in the setting of epidemiological exploration on epilepsy. Until recently, all the evidence on epilepsy disorders in the Gulf States was obtained from hospital-based populations, which may not be illustrative of the burden in the community [9-10].

Epilepsy prevalence in Saudi Arabia is estimated to be 6.54 per 1000 (95% confidence interval 5.48–7.60) [11].

In line with other countries rules and requirements, it would be safer for patients and community, if the seizures were controlled (Seizure free remission) for about 12 months prior to granting unlimited driving license. Data from single center in Saudi Arabia showed that one-year seizure free remission is achievable in 80% of patients [12].

There is only one study, published in 2000, about epilepsy and driving conducted in the central region, Saudi Arabia which showed descriptive analysis of the driving status in relation to epilepsy and the main limitation for this study was the small number of subjects and that it was not statistically powered to be generalized to the country [13].

The aim of this research was to evaluate the eligibility to drive cars based on achieving one year seizure free remission among male epileptic patients aging more than 18 years old in a statistically representative sample to the Saudi population.

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METHODS AND MATERIALS

Study Design: a cross sectional study design was used. We enrolled patients and collected data in one single visit.

Subjects and method: patients fulfilling eligibility criteria (Males > 18 years' old, established diagnosis of epilepsy since > 1 year, Informed Patient consent) were invited to participate in a survey covering their driving status as in a brief case report form. A random data source verification of 20% of the case report forms as quality control of collected data. To allow extrapolation of the results to the broadest possible population, all patients who met the eligibility criteria were enrolled in the study. Each investigator included about 25 consecutive patients. This consecutive recruitment would limit bias of patient selection. The primary evaluation criteria were: number & percent of patients eligible to drive cars, percent of patients holding driver license who are eligible to drive, percent of patients practicing driving who are eligible to drive. The secondary evaluation criteria were: Correlate eligibility with Seizure type, etiology and Medication received, occurrence of fits during driving, percent of patient received education about driving and epilepsy.

Sample size and statistical Analysis: was calculated to recruit 170 patients in Saudi Arabia. We assumed a one-year seizure free remission of 80%, based on literature review [(12)], with a precision of ± 5.9%. A projected sample size of 170 individuals should allow us to perform 2-talied tests with 95% confidence level. Statistical analysis included all patients recruited in the study. Descriptive analysis was performed for Patients' characteristics (demographic data, seizure type, etiology, treatment … etc.).

Quantitative data were described using mean, median, standard deviation and range for continuous parameters. Patients' count and proportions for categorical parameters. All statistical tests were performed using two-tailed tests at a 5% level of significance. Moreover, statistical tests were performed on comparing different groups. Chi square test was used to compare between categorical parameters. The results are calculated at 25% CI and 5% level of significance.

For parametric data; two-tailed paired t-test and repeated measures ANOVA were used when comparing between repeated measurements while independent t-test and one way ANOVA when comparing between study groups

RESULTS

During January 2018, we recruited 170 consenting patients fulfilling the inclusion criteria. The mean age was 37.7 years (range 18-90, SD +16.9 years). All patients were men. All patients had epilepsy for more than one year. Table 1 depicts patient's demographics and disease characteristics.

Primary endpoints:

Out of 170 patients, 106 patients (62.4%) achieved one-year seizure free remission. Out of 161 patients holding a driver license only 105 patients (65.2%) were eligible to drive. Patients who declared that they were practicing car driving were 146 patients; only 104 patients (71.2%) were eligible to drive.

Looking at our data from another perspective, we observed that 64 patients (37.6%) were not eligible to drive cars since they failed to achieve 1 year seizure free remission. 56 patients (34.8%) were holding a driver license despite their seizures are not controlled and 42 patients (28.8%) were driving cars even though they should avoid harming themselves and others.

Secondary endpoints:

Correlation of driving eligibility to Seizure type, Etiology and Medication: table 2.

Experiencing fits while driving:

35 patients (20.5%) declared that they experienced fits while driving, 15 patients (14.1%) in the eligible group and 20 patients (31.3%) in the non-eligible group denoting statistically significant difference (p= 0.00758).

Receiving advices about driving by healthcare professionals:

46 patients (27.1%) declared that they have received patient education and advices regarding driving from their healthcare providers. 29 patients (27.3%) in the eligible group and 17 patients (26.6%) in the non-eligible group, which was not statistically significant (p= 0.9124). Also, educational level of the patients had no impact on asking for advices regarding driving (p=0.29372).

Table 1: Patients Demographics and Disease Characteristics

	Number	%
Sex		
Males	170	100%
Education		
High School and above	131	77.1%
Elementary	39	22.9%
Employment		
Students	42	24.7%
Unemployed	25	14.7%
Retired	19	11.2%
Business men	17	10%
Teacher	11	6.5%
Driver	11	6.5%
Others	45	26.5%
Seizure Type		
Generalized tonic-clonic	98	57.6%
Absence	27	15.9%
Unclassified	26	15.3%
Clonic	14	8.2%
Others	5	2.9%
Etiology		
Idiopathic	154	90.6%
Cryptogenic	9	5.3%
Symptomatic	7	4.1%
Antiepileptic Treatment		
Monotherapy	64	37.6
Polytherapy	104	61.2%
No Treatment	2	1.2%

Table 2: Correlation of driving eligibility to Seizure type, Etiology and Medication

	Eligible to Drive		Not Eligible to Drive		p-Value
	Number	%	Number	%	
	106	62.4%	64	37.6%	
Seizure Type					
Generalized tonic-clonic	66	62.3%	32	50%	0.11642
Absence	13	12.3%	14	22%	0.09692
Unclassified	13	12.3%	13	20%	0.15854
Clonic	10	9.4%	4	6%	0.4654
Others	4	3.8%	1	2%	0.40654
Etiology					
Idiopathic	101	95.3%	53	83%	0.00694
Cryptogenic	4	3.8%	5	8%	0.25428
Symptomatic	1	0.9%	6	9%	0.00736
Antiepileptic Treatment					
Monotherapy	36	34%	28	44%	0.20054
Polytherapy	68	64.2%	36	56%	0.30772
No Treatment	2	1.9%	0	0%	0.267

DISCUSSION

Our results reflect the level of control of epileptic patients in Saudi Arabia. The one-year seizure free remission rate was 62.4%, which is far below what has been reported by ***AbdulJabbar M et al*** .[12] in 1998 with one-year seizure free remission of 80% in a study involving 826 patients. Also in 2000 ***AbdulJabbar*** [13] reported in a study involving 138 patients conducted in King Khalid university hospital, Riyadh a 73.9% of the patients were controlled. In our cohort, idiopathic epilepsy was the dominant etiology and generalized tonic-clonic seizures whether primary or secondary represents 57.6%. Within our cohort, we can notice high prevalence of absence and unclassified epilepsies 15.9% and 15.3% respectively but the study was not intensive enough to detect prevalence of seizure types. Even more, epileptic patients with idiopathic etiology seem to have a better chance achieving 1-year seizure free remission and an opportunity to drive safer.

Considering the Saudi population of 31 million and that males both adolescents and adults account for 11.5 million [14]. The prevalence of epilepsy patients would be 75 thousand epileptic patients. If we extrapolate our results, 71 thousand epileptic patients would be holding valid driving license, 64 thousand car drivers currently and more seriously 22 thousand car drivers would suffer from uncontrolled epilepsy on roads with increased risk of road traffic accidents.

The impulsive and unpredictable nature of seizures imposes some limitations on the patient's ability to drive cars as the fits may increase the probable risk of road traffic accidents jeopardizing the lives of both the sufferer and innocent individuals around at the time of such a tragedy. These limitations contribute to the stigma accompanying epilepsy [13]. This issue is principally vital when it comes to driving cars and specific professions like operation of heavyweight machinery. Due to safety concerns, when licenses for driving turn out to be obligatory, those patients having epilepsy were mostly declined a license [14]. The probable legislative prohibition to drive impends employment for professional chauffeurs and patients who require transportation to work without having the capacity of hiring their own drivers. This restriction disturbs social wellbeing and increases the suffering of the epileptic. Numerous boundaries are compulsory on the victims of this disease in different states including suppression of the license for several periods reaching up to five years till the seizures are under control and the patient is considered to be at less risk of car accidents [13,14]. In the 1970s, a guide was established in USA, UK, and various countries that patients with epilepsy may legally drive cars if their fits were satisfactorily under control [13,14]. In Saudi Arabia, up to the author knowledge, epileptic patient has no official limitations to drive cars. Published data from Saudi Arabia shows that there are 526,000 traffic accident a year costing 5,6 billion dollars and costlier 17 fatalities daily. Saudi Ranked in the 23 position in terms of traffic accident fatalities with 27/100,000 deaths [13].

Till we can reach a higher control rate of epilepsy, our key imperative is to improve epileptic patients' education especially uncontrolled patients about the risk of driving in collaboration with traffic department and other key players in health education and awareness programs. In Saudi Arabia hospitals we have to work on patient education since our results show very low level of practicing health education to epileptics (27.1%) by healthcare providers.

Further to that, dealing with epileptic patients, we have to open dialogue with the regulator in Saudi Arabia to have more stringent laws such as suspending the driving license or shortening its validity and meanwhile, encourage community service and charitable societies to provide safe means of transportation to uncontrolled epileptics till they reach control.

CONCLUSION

Among our study population, relatively lower control of epilepsy was observed with increased risk of seizures during driving that may lead to serious consequences. Health education regarding driving especially for uncontrolled patients is a key area for improvement till achieving higher seizure remission rate.

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