



RESEARCH ARTICLE - MEDICAL TECHNIQUES

Comorbidities among Patients with Epilepsy Attending Imam Al-Sadiq General Hospital in Babylon Governorate, Iraq

Bilal Hadi Jawad^{1*}, Khadija Shaban Hassan¹, Wahab Razzaq Ebdan²

¹ College of Health & Medical Technology - Baghdad, Middle Technical University, Baghdad, Iraq

² Consultant Neurologist at Imam Al-Sadiq General Hospital / Babylon University College of Medicine

* Corresponding author E-mail: bilalhadi.fa25@gmail.com

Article Info.	Abstract
<p><i>Article history:</i></p> <p>Received 23 June 2022</p> <p>Accepted 23 July 2022</p> <p>Publishing 15 November 2022</p>	<p>People with epilepsy often have other health conditions. Epidemiological findings are an important source of information on the topic of epilepsy comorbidity. These investigations show that patients with epilepsy frequently suffer from co-occurring disorders, involving nearly all body systems.</p> <p>This study aims to determine the frequency of comorbidities among epilepsy patients. Patient and method: a descriptive cross-sectional study conducted at Imam Al-Sadiq general hospital, included 225 participants collected from 10th January/2022 to 10th May/2022. The samples were collected under the supervision of a neurologist.</p> <p>The mean age of epilepsy was 32.26 ± 13.94. 55.6% of the participants were males and 44.4% were females, the male to female ratio was 1.25:1. Vast majority (83.5%) of the studied samples had a low socio-economic status. prevalence of comorbidities among patients with epilepsy was high Among medical comorbidities, the highest percentage (56.9%) of participants were suffering from migraine. Among psychiatric comorbidities, 67.1% of them were suffered from anxiety and 61.9% with depression. 7.6% of patient were suffering from Dementia/ Alzheimer's disease as cognitive comorbidities.</p> <p>It found an increased risk for full spectrum of medical, psychiatric disorders. The most common medical comorbidities were migraines and musculoskeletal system disorders. more than half of participants were suffering from anxiety and depression, half of them with sleep disorders.</p> <p>More comprehensive assessment with advanced diagnostic and treatment standards and treating not only the epilepsy but also any other present conditions.</p>
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1. Introduction

Epilepsy is a significant public health issue to its negative effects on health, society, culture, and economy. It is burdensome not just because of the seizures themselves, but also because of the comorbidities, limitations, and stigma attached to the condition [1]. Any distinct extra entity that has been or may develop during the clinical course of a patient who has the index disease (i.e., epilepsy) under investigation," according to the definition. When discussing epilepsy, keep in mind that it is a spectrum of distinct brain disorders with variances in aetiology, clinical features, demography, treatment responses, and prognosis [2]. In low and middle-income countries (LMICs), epilepsy is a major public health problem, and comorbidities aggravate the disease's impact. Although recognizing the primary comorbidities of epilepsy and their relative relevance is vital for enhancing the quality of care, the epidemiology of these comorbidities has not been adequately characterized [1]. In patients with epilepsy, comorbid disorders are frequent, and their existence has significant consequences for diagnosis, treatment, medical expenditures, and quality of life. Medical, mental, and cognitive problems, alone or in combination, are comorbid conditions in epilepsy that can last a lifetime [3]. People with epilepsy are up to eight times more likely than the general population to suffer from anxiety, depression, dementia, migraine, heart disease, peptic ulcers, and arthritis. New and established screening instruments and recommendations are urgently needed to aid in the early diagnosis and treatment of comorbid diseases. According to preliminary research, several diseases, such as depression and migraine, have a poor impact on seizure outcome and quality of life [4]. Among the hypothesized explanations for this association are the following: first, the comorbid condition (including its treatment) causes epilepsy; second, the comorbid condition causes epilepsy; or third, a common pathogenic mechanism mediates the co-occurrence of epilepsy and the comorbid condition. For all of the epilepsy comorbid disorders, a single explanation is unlikely to suffice. The foundation of the relationship between epilepsy and its concomitant diseases has crucial diagnostic and therapeutic implications [3]. Epilepsy and psychiatric illnesses are frequently linked. According to studies, people with epilepsy can acquire psychological illnesses up to 50% of the time, with depression, anxiety, and psychoses being the most prevalent [5]. Comorbid mental disease may raise health-care costs and socioeconomic difficulties due to long-term impairment and morbidity, as well intensify epileptic patients' diagnosis and treatment [6].

Nomenclature			
PWE	Patient with Epilepsy	SDCv	Socio-Demographic Characteristic variables
LMICs	Low and Middle-Income Countries	SD	standard Deviation
SES	Socio-Economic Status	SPSS	Statistical Package for the Social Sciences
PHQ 9	Patient Health Questionnaire 9	GAD 7	Generalized Anxiety Disorder 7

1.1. Aims of the study

- 1- To determine the frequency of comorbidities among people with epilepsy (PWE) attending neurology of outpatient clinic at Imam Al-Sadiq hospital in Babylon governorate.
- 2- To determine the association of comorbidities between both Gender.

2. Patients and Methods

A descriptive; cross sectional study conducted at Imam Al-Sadiq hospital, included 225 participants among PWE attending the outpatient neurologic clinic. Study sample was collected under the supervision of neurologist. The questionnaire consists of two part; socio-demographic and clinical information. It depending on [7] to construct the questions associated with comorbidities. To assess depressive status of patient, validated well known questionnaire form: Patient Health Questionnaire 9 (PHQ 9) [8] was used. For assessment anxiety, the most recommendatory anxiety screening tools was the Generalized Anxiety Disorder 7 (GAD-7) [9]. Nine questions make up this questionnaire designed to assess anxiety and depression status, and the patient's responses are rated on a Likert scale of 1 to 4. This is determined by giving the response categories of "not at all," "a few days," "more than half the days," and "almost every day" scores of 0, 1, 2, and 3, respectively.

2.1. Duration of the study

The data collection continued for the period of 4 months starting on 10th /January/2022 to 10th /May/2022.

2.2. Setting of the study

Study was conducted in the neurology outpatient clinic of Imam Al-Sadiq General Hospital.

2.3. Inclusion Criteria

- Patients diagnosed with epilepsy by physicians who are from the residents of Babel Governorate.
- Adult Epileptic patients (18 years and more) of both sexes who were able to offer verbal consent, and were willing to participate in this study.

2.4. Exclusion Criteria

- Patient less than 18 years old.
- Uncooperative patient.
- Those patients provide incomplete or conflicting information during filling the questionnaire.
- Patients who live outside of Babel Governorate.
- Patients who suffered from an epileptic seizure during filling the questionnaire.

2.5. Data collection technique

A convenient sample targeted 225 adults' patients with epilepsy who have been diagnosed by neurologists in Imam al-Sadiq general hospital. Data were collected by using direct interview (face to face interview) technique.

2.6. Statistical analysis

- Data entry and data analysis were carried out using SPSS version 26 software.
- Values were presented as mean \pm standard deviation (SD) (based on their normality).
- For continuous variables and as number (percent) of subjects and pie chart for categorical variables.
- Pearson Chi-square test for statistical analyses. Significance considered whenever the P-value was equal or less than 0.05.

3. Result

This cross-sectional study comprised 225 epileptic patients. Mean of age was (32.26 \pm 13.94). The highest percentage of epilepsy was in the age groups 20-29 years (26.6%) while the lowest percentages (6.2%) were in the age group \leq 60 years. (55.6%) of them were male and (44.4%) were female, the male to female ratio was 1.25:1; (50.7%) were single; (78.7%) with unskilled manual occupations; (27.5%) had Intermediate education;(74.7%) live in rural; (83.1%) without family history of epilepsy; as shown in Table 1.

Table 1 Distribution of studied subjects according to Socio-Demographical Characteristics

SDCv	Classes	n=225	%
Age (yr.)	< 20 years	53	23.6
	20-29	60	26.6
	30-39	48	21.3
	40-49	33	14.7
	50-59	17	7.6
	60 year or more	14	6.2
	Mean \pm SD (Range)		32.26 \pm 13.94
Gender	Male	125	55.6
	Female	100	44.4
Marital status	Single	114	50.7
	Married	103	45.8
	Divorced	7	3.1
	Widow	1	0.4
Occupation status	Unskilled manual occupations	177	78.7
	Semi-skilled manual occupations	20	8.9
	Skilled manual and non-manual occupations	7	3.1
	Associate professional occupations	16	7.1
	Skilled professional or senior managerial occupations	5	2.2
	Illiterate	55	24.4
Educational level	Primary (or read and write)	59	26.2
	Intermediate	62	27.5
	High school or vocational	26	11.6
	Institute (2 years)	9	4.0
	College (Bachelor degree)	8	3.6
	College (Master degree)	6	2.7
Residency	Urban	57	25.3
	Rural	168	74.7
Family History	Negative	187	83.1
	Positive	38	16.9

Fig. 1 shows observed frequencies and percent of "Socio-Economic Status- SES". Vast majority (83.5%) of participants in current study with low socioeconomic status.

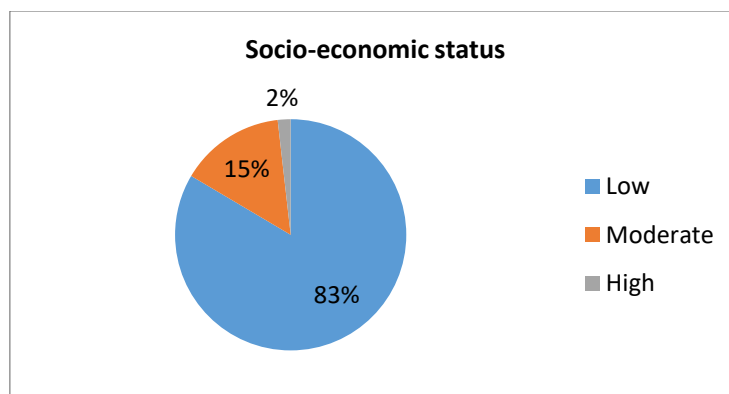


Fig 1. Distribution of SES for the studied patients

3.1. Frequency of comorbidities among participants

Table 2 illustrate the distribution of comorbidities among participants. Among medical comorbidities, in decreasing order of frequency; migraine was (56.9%) among of participants, musculoskeletal disorders (44%), arthritis/rheumatism (34.2%), Cerebrovascular accidents

(21.8%), respiratory system disorders (15.6%), Gastrointestinal and digestive disorders (13.8%), Osteoporosis (9.3%), Hypertension (8.4%), fractures (4.4), diabetes (3.6) and others (6.2) such as deafness, leukemia and eye disorders. With respect to psychiatric comorbidities, (67.1%) of them were suffer from anxiety, (60.9%) depression and (50.2%) sleep disorders. Regarding to cognitive comorbidities, (7.6%) of patient were had Dementia/ Alzheimer’s disease.

Table 2 Distribution of studied sample according to comorbidities (N=225)

Comorbidities	Yes		NO	
	No.	%	No.	%
Medical Comorbidities				
Musculoskeletal system disorders	99	44.0	126	56.0
Gastrointestinal and digestive disorders	31	13.8	194	86.2
Respiratory system disorders	35	15.6	190	84.4
Cerebrovascular accidents	49	21.8	176	78.2
Migraine	128	56.9	97	43.1
Diabetes	8	3.6	217	96.4
Hypertension	19	8.4	206	91.6
Fractures	10	4.4	215	95.6
Osteoporosis	21	9.3	204	90.7
Others*	14	6.2	211	93.8
Psychological comorbidities				
Sleep disorders	113	50.2	112	49.8
Anxiety disorder	151	67.1	74	32.9
Depression disorder	137	60.9	88	39.1
psychosis of epilepsy	16	7.1	209	92.9
Cognitive comorbidities				
Dementia/ Alzheimer’s disease	12	5.3	213	94.7

*Others = deafness, leukemia and eye disorders

3.2. Comorbidities between both Gender

with regard to somatic comorbidities, non-significant association between all somatic comorbidities included in study and gender, as well non-significant association between cognitive comorbidities and gender. According to psychiatric comorbidities, there is significant association only between gender and depression. Whereas, males with epilepsy are more exposed to depression than female. Non-significant association between gender and others psychiatric comorbidities as show in Table 3.

Table 3 Association of Comorbidities with both gender

Comorbidities	No.	Gender		P-value
		Male %	Female %	
Medical comorbidities				
Musculoskeletal system disorders	60	26.7%	39 17.3%	0.177
Gastrointestinal and digestive disorders	15	6.7%	16 7.1%	0.387
Respiratory system disorders	21	9.3%	14 6.2%	0.565
Cerebrovascular accidents	30	13.3%	19 8.4%	0.367
Migraine	103	45.8%	74 32.9%	0.126
Diabetes	5	2.2%	3 1.3%	0.687
Hypertension	10	4.4%	9 4.0%	0.789
Fractures	5	2.2%	5 2.2%	0.718
Osteoporosis	13	5.8%	8 3.6%	0.539
Others*	14	6.2	211 93.8	0.933
Psychiatric comorbidities				
Sleep disorders	61	27.1%	52 23.1%	0.633
Anxiety state	79	35.1%	72 32.0%	0.163
Depressive state	84	37.3%	53 23.6%	0.030 *

Psychosis	30	13.3%	17	7.6%	0.199
			Cognitive comorbidities		
dementia	11	4.9%	6	2.7%	0.430

Significant difference between proportions using Pearson Chi-square test at 0.05 level.

* Significant at P-value ≤ 0.05 .

*Others = deafness +leukemia and eye disorders

4. Discussion

The mean age of participants was (32.26 ± 13.94) . This result is compatible with several studies carried out in different countries including; in study conducted in Karbala, Iraq [6] which found the mean age of the patients in the sample was 28.88 ± 14.28 year ; in UAE [10] found that mean age was 33.6 years. 83.5% of participants in current study with low socioeconomic status, these result disagreement with other study, in Baghdad [11] that found highest percentage (44%) of study sample with moderate SES; in Basrah [12] found that (43.2%) of participant with moderate SES . These differences may be due to sample size or regional variation. For medical comorbidities; majority of them had musculoskeletal system disorders compatible with the findings of study conducted [13] in Egypt ,this compatible may be due to Long-term use of anti-epileptic drugs (AEDs) is commonly associated with bone health problems; about half of them had migraine much more than what we found in other studies [14] in Baghdad and [1]. This increase may be due to different diagnostic tools; other medical comorbidities such as cerebrovascular accident, Arthritis/rheumatism, diabetes, hypertension, fracture and osteoporosis also found in other studies in similar proportions to the findings [15] ,[1].

Regarding to psychiatric comorbidities, half (50.2%) of participants was suffer from sleep disorders, this result supported by study in Poland [16] found that (58.3%) of participant suffer from sleep disorders. This agreement may be due to majority of PWE in our study and other studies suffer from anxiety and depression. With respect to anxiety, the prevalence of anxiety was (67.1%) among participants, much more than what we found in some other studies; in UAE [10] found that anxiety among PWE were 26.2%;in Addis Ababa, Ethiopia [17] found that (33.5%) of PWE suffer from anxiety. The difference between the results may be related to negative attitudes and misconceptions about epilepsy that make the patient think about not getting a job or the difficulty of marriage and may be related to the economic situation in the country. As for depression, high prevalence of depression was found. Prevalence of depression was (60.9%) among participant. this result consistent with the finding of study conducted in Karbala [6] found that the vast majority (81.9%) of participant suffer from depression, and different from the result of other studies; in Addis Ababa, Ethiopia [17] found that (32.8 % %) of participant suffer from depression; in UAE [10] found that (28.7%) of participants with depression. This similarity and difference may be also related to the negative attitudes and misconceptions around epilepsy and economic state in the country. Antiepileptic drugs, seizure-related factors and psychosocial variables contribute to high rates of disorder. As regard to psychosis of epilepsy, A small percentage(7.1%) of the participants were suffering from psychosis, agreement with other studies; in Ireland [18] found that (5.6%) of participants were suffering from psychosis; in Canada [15] found that (5.5%) of participants with psychosis. Regarding cognitive comorbidities, (5.3%) of the participants had dementia close to the finding of study conducted in Canada [15] found that (4.1%) of the participants with dementia. Regarding Association of Comorbidities with both gender significant association between gender and depression Whereas, males with epilepsy are more exposed to depression than female. This result is consistent with study conducted in Karbala [6] found that clear difference between males and females. The higher prevalence of depression among male might be related the sociocultural female dominant culture in oriental communities, in addition to the worse feeling of stigma in male than that female patients in these communities.

5. Conclusion

The burden of comorbidities among people with epilepsy was high. Highest somatic comorbidities were migraines and musculoskeletal system disorders. More than half of participants were suffer from anxiety and depression. About half of participant was had sleep disorders. Among patient with epilepsy, there is non-significant association between comorbidities and gender except with depression was significant.

6. Recommendation

The researchers need to develop more thorough and systematic research with enhanced diagnostic and treatment criteria. Advances in detecting the disease's comorbidities will help to enhance the disease's overall care. The high frequency of comorbidities among people with epilepsy necessitates its treatment before or simultaneously with treating epilepsy.

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