Original research

Assessment of knowledge and awareness of community pharmacist toward epilepsy

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Abstract: Community pharmacist plays an essential role in educating the epileptic patients about their disease and medications. Improving the patient's awareness may lead to improve their compliance and decrease drug-drug interaction and ultimately improve their quality of life. Pharmacist can detect the emergence of health problems and can help prevent progression of comorbidities. Considering the complexity of treating epilepsy and the lack of information about pharmacists' contributions to epilepsy management, pharmacist performed pharmaceutical counselling, pharmaco-therapeutic follow-up and systematic measurement and evaluation of findings and increase medication adherence of patient with epilepsy. This study was aimed to assess the community pharmacist's knowledge about epilepsy and their treatment by antiepileptic drugs in Libya. The design of the study is a cross sectional study. The knowledge was collected through a questionnaire which included 35 questions divided into three sections: demographic data, general information about epilepsy and information about epilepsy and antiepileptic drugs. The questionnaire was prepared and validated by consultant training in Ali Omer Asker Hospital in Tripoli for two months. The findings indicate that over 200 patients are altered viewed, of whom, only epileptic patients were observed. The majority of the participants were female, qualification degree BSc and years of experience from one to five years. Unfortunately, some of the participants (40.0%) had poor knowledge and about 60.0% of them had good knowledge. This study indicates that the importance of community pharmacist in Libya requires more improvement to achieve the existing function and that the impact of continuous study of everything related to diseases and medicines is important to obtain a qualified pharmacist who can become an effective agent for a change.

Introduction

Epilepsy is a neurological disorder caused by an abnormal electrical discharge in the brain, affecting around 50 million people worldwide [1]. About 80% of the people with epilepsy live in low- and middle- income countries. A three quarter of the people with epilepsy may not receive the treatment they need. It is estimated that up to 70.0% of the people living with epilepsy could live seizure- free if properly diagnosed and treated [1, 2]. In Libya, epilepsy has a prevalence rate of 230 cases per 100 000 people [3]. Epilepsy can be caused by genetic or acquired factors such as brain injury, stroke,

brain tumours, infections of the brain or birth defects. Seizures are divided into two main types - generalized and partial. This is based on the international classification of epileptic seizures proposed by the commission on classification and terminology of the International League against Epilepsy (ILAE) with signs and symptoms of loss of awareness or consciousness, a staring spell and disturbances of movement, sensation (including vision, hearing and taste) mood or other cognitive functions, anxiety or psychosis and depression [4]. Thus, epilepsy can be treated by anti-epileptic drugs (AEDs) including phenytoin, carbamaz-epine, levetiracetam and valproate. Effective of the treatment of types of epilepsy but AEDs also effect on patient health as hepatotoxicity, renal stone, polycystic ovary syndrome, aplastic anaemia, rash, decrease in hormones and vitamins of body as vitamin B12, vitamin D are common in patients with epilepsy on AEDs. Monitoring of vitamin D levels should be considered as a part of the routine management of patients with epilepsy and lifestyle modifications and neurosurgery [5].

Pharmacist plays an essential role in educating the epileptic patients about their disease and their medications. Improve the patient's knowledge and awareness may lead to improve their compliance and decrease drug-drug interaction, resulting in improved clinical outcomes and decreased costs and ultimately improve their quality of life. Pharmacist involved in the review of prescriptions were able to prevent errors in dose and frequency of administration of AEDs and prevent problems related to the use of medicines. Identified therapeutic problems and proposed changes in prescriptions to a health team when the pharmaco-therapy was not appropriate. Pharmacist can detect the emergence of health problems and can help prevent the progression of comorbidities. Considering the complexity of treating epilepsy and the lack of information about pharmacists' contributions to epilepsy management. Pharmacist performed pharmaceutical counselling, pharmaco-therapeutic follow-up and systematic measurement as well as evaluation of findings and increase medication adherence of people with epilepsy. Pharmacist also guided to ensure the adequacy of the pharmaco-therapy through therapeutic drug monitoring. All of these successful scenarios demonstrate that including pharmacists in care staffs produces effective results for the success of pharmaco-therapy and the quality of life of people with epilepsy. Therefore, the present project was started by attending a training session at the epilepsy unit Ali Omer asker hospital by training to get acquainted with epilepsy disease and its treatment through patient's observation, under the supervision of a specialist at this unit. This trained allowed us to know all types of medication used to treat different types of epilepsy and prepared us to conduct the second part of the work, and that is assessing the knowledge and awareness of Libyan community pharmacist about epilepsy and its treatment with antiepileptic drugs [6]. Thus, this study aimed to identify clinical services performed by pharmacists for people with epilepsy and the services' impact on the health of these patients.

Materials and methods

The study was planned as self-designed cross-sectional questionnaire study. The knowledge was collected through a pretested validated questionnaire. The questionnaire included 35 questions divided into three parts: the first part is demographic data (five questions), the second part is general information about epilepsy (15 questions divided into multiple choice question and yes or no). The third part is concentrated on data about epilepsy and antiepileptic drugs (15 questions).

The questionnaire was prepared with the help of consultant training in Ali Omer Asker Hospital in the Andalus district in Tripoli for two months. Over 200 patients were altered viewed, of whom, only epileptic patients were observed. Some cases in addition to epilepsy with other complications such as diabetes mellites, hypertension, arteriosclerosis, kidney and liver diseases, heart failure, lung sensitivity, pregnancy. Some cases of epilepsy were psychosis and depression. In addition to cases that have been completely cured of epilepsy. Throughout training, several epileptic seizures attack were observed, some of which will be fisted in the results. Questionnaires have been distributed online and offline for pharmacists working in different pharmacies during the beginning of 2021

and data was collected. An ethical approval for the study was obtained from the ethics committee of the administration of University of Tripoli, Tripoli, Libya before starting the study (2021/001). Analysis of data as descriptive statistics was conducted by using SPSS package 21.

Results

The majority of the participants were female subjects (66.0%) with a qualification degree of bachelor of pharmaceutical (79.0%) and duration of experience from one to five years (45.9%). The demographic data of the pharmacists participated in the present study is presented in **Table 1**.

Table 1: Pharmacists demographic data of Libyan pharmacists

Total	Percentage
Gender	
Male	34.0%
Female	66.0%
Qualification degree	
Bachelor of pharmacy	79.0%
Mater of Sciences	21.0%
Years of experience	
One year	28.1%
One to five years	45.9%
Five to ten years	21.2%
More than ten years	04.8%

In **Table 2**, answers to Q-1 that 53.3% of pharmacists believed that epilepsy is a mental disorder and a disorder caused by abnormal electrical discharges in the brain, where also 46.7% stated that epilepsy is a disorder caused by abnormal electrical discharges in the brain. While epilepsy is a disorder caused by abnormal electrical discharges in the brain. In response to Q-2, 80% of pharmacists know the situations will increase seizures, only 20% answered incorrectly. 53.3% of answers to Q-3, they believe that there is no correct answer to this question while the other half their answers differed on this question, from legal point of view, epilepsy patients are prevented from driving a car but not everyone applies to this clause, so the answers to this question are differed. 80% of the answers to Q-4 agreed that the patient does not stop taking the medicine without consulting his physician, even if the seizure has stopped. More than 66.7% of the answers to Q-5 is correct. When answering to Q-6 and 7, the majority of the responders think that epilepsy cannot be treated completely and the chance of epilepsy does not increase with age but these answers incorrect (70.0%). 46.7% of pharmacists respond to Q-8, violent sports is appropriate for epilepsy patients but this type of sport causes stress and pressure on patient health and, thus, the chance of a seizure increase, so epilepsy patient must have the physician's consult before doing this kind of sport. Only 26.7% of the answers to Q-9 was all people with epilepsy loss consciousness during the seizure was answered correctly (73.3%). 60.0% of answers to Q-10 and 11 were corrected by pharmacists. In Q-10, brain damage is one of the causes of epilepsy, but not always. More than 80% of the pharmacists answered correctly for Q-12 about epilepsy and depression. Answers to Q-13, about pregnant epilepsy was 93.7%. 73.3% of pharmacists who responded to Q-14 which related to epilepsy as a disorder of the transmission of electrical signals within the brain. Answers to Q-15 that related to careful of community pharmacists on the patient's health, as they could not prescribe any medicine without a prescription to preserve the patient's health from side effects (93.3%).

In **Table 3**, when answering to Q-16 about (75.0%) of pharmacists answers in yes on the question if valproate is the drug of choice for juvenile myoclonic epilepsy. While 26.4% of pharmacists answers is no. In answers to Q-17, the majority of pharmacists about 85.0% agreed on an anti-epileptic drug can be described as an abnormality in the function of nerve cells in the brain which is the correct answer about the epileptic seizure, where 16.6% did not agree. In response to Q-18 and 19, more than half of responder (55.3%) suggested that vigabatrin causes aggressiveness and 66% answered not all seizure can affect both sides of the brain, it may even affect one part of the brain. Regarding Q-20, only 35.6% of questioned pharmacists agreed that the antiepileptic drug (valproate) can cause a decrease of vitamin D. 40.0% of pharmacists answered properly on Q-21 regarding high level vitamin B-12 which may lead to a decrease of potassium and then may lead to

Table 2: General information about Libyan epileptic patients

Questions	% of correct answer	% of incorrect answer	correct answer
MCQ			
Q-1: What is epilepsy? **A.** A mental disorder **B.** A disorder caused by abnormal electrical discharges in the brain **C.** A disorder that you can catch that causes people to shake all over **D.** Both A and B are correct	44.7%	55.3%	**B**
Q-2: In epilepsy patients, which of the following situations will increase seizures: **A.** Not taking his seizure medication **B.** Not getting enough sleep **C.** Stress **D.** All of the above	74.5%	25.5%	**D**
Q-3: If patient is still having seizures, he can drive a car under the following conditions: **A.** If he drives only when someone else is in a car **B.** If he "double-up" on his medication just before driving **C.** If he pulls over when he felt a seizure coming on **D.** None of the above	41.6%	58.4%	**D**
Q-4: If the patient stops having seizures while taking his seizure medicine, he can do the following: **A.** Stop his medicine because he does not need it **B.** Reduce his medicine without asking his doctor **C.** Continue taking medicine as ordered **D.** Stop taking his medicine every day and take double doses when he "feels a seizure coming on	81.2%	18.8%	**C**
Yes / No			
Q-5: Blood samples can be used to measure the concentrations of anti-epileptic drugs in the system.	75.0%	25.0%	**Yes**
Q-6: Epilepsy can be treated completely.	30.2%	69.8%	**Yes**
Q-7: The chance of epilepsy increase with age.	39.6%	60.4%	**Yes**
Q-8: Violent sports s such as boxing is appropriate for epilepsy to dispose of excess shipments.	63.4%	36.6%	**No**
Q-9: All people with epilepsy loss consciousness during a seizure.	66.7%	33.3%	**No**
Q-10: Epilepsy can always be caused by brain damage.	54.4%	45.6%	**No**
Q-11: An epileptic seizure can be described as a temporary lack of oxygen to the brain.	69.1%	30.9%	**No**
Q-12: Does a patient with epilepsy get depression?	80.5%	19.5%	**Yes**
Q-13: To prevent birth defects, women with epilepsy should stop taking their medicine by themselves, if they become pregnant.	85.8%	14.2%	**No**
Q-14: Are anti-epileptic drugs making a behavioural change in epilepsy children?	69.6%	30.4%	**Yes**
Q-15: As a pharmacist, do you have the ability to issue anti-epileptic drugs without prescription?	87.1%	12.9%	**No**

heart failure. When the answer on which of these common anti-epileptic drugs cause psychosis and anorexia in Q-22, 30.0% answer carbamazepine while 45.0% answer levetriacetam which is correct answer. About 50.0% agreed that carbamazepine act as a mood stabilizer in Q-23. In Q-24, about 60.0% from pharmacists agreed that phenytoin causes side effects like hepatotoxicity, aplastic anaemia and intractable bleeding. 67.0% of the pharmacists believed that mothers taking phenobarbital during pregnancy may get deficient in vitamin K dependent clotting factor at birth. In **Table 3**, when answering to Q-26, the antiepileptic drug may cause impaired sexual function for male

Table 3: Specific information about epilepsy and antiepileptic drugs

Questions	Correct	Incorrect	Answer
Yes / No			
Q-16: Drug of choice for juvenile myoclonic epilepsy is valproate.	73.4%	26.6%	**Yes**
Q-17: An epileptic seizure is described as abnormality in function of nerve cells in brain.	84.0%	16.0%	**Yes**
Q-18: Vigabatrin (Sabriel) cause aggressiveness.	55.0%	45.0%	**Yes**
Q-19: All seizure can affect both sides of the brain.	65.7%	34.3%	**No**
Q-20: Anti-epileptic drug as (valproate) can cause: **A.** Decrease vitamin D **B.** Increase vitamin B-12 **C.** Increase vitamin D **D.** B & C are correct	35.9%	64.1%	**A**
Q-21: Increase of vitamin B-12 in the body of epileptic patients may lead to: **A.** Increase in potassium and heart failure **B.** Decrease of potassium and heart failure **C.** All of the above **D.** None of the above	37.0%	63.0%	**B**
MCQ			
Q-22: Which of these common anti-epileptic drugs cause psychosis and anorexia? **A.** Levetiracetam **B.** Carbamazepine **C.** Valproate **D.** Lamotrigine	44.8%	55.2%	**A**
Q-23: Anti-epileptic drug act as mood stabilizer: **A.** Carbamazepine **B.** Levetiracetam **C.** Lamotrigine **D.** None of above	47.6%	52.4%	**A**
Q-24: Phenytoin cause side effect like: **A.** Hepatoxicity **B.** Aplastic anaemia **C.** Intractable bleeding **D.** All of the above	60.4%	39.6%	**D**
Q-25: Mothers taking Phenobarbital during pregnancy may get: **A.** increase in Vitamin D **B.** Deficiency in Vitamin K dependent clotting factor at birth **C.** increase in Vitamin K dependent clotting factor at birth **D.** All of the above	68.1%	31.9%	**B**
Q-26: Which of these anti-epileptic drugs may cause impaired sexual function for male? **A.** Carbamazepine **B.** Oxcarbazepine **C.** Levetiracetam **D.** A & B are correct	48.6%	51.4%	**A**
Q-27: Adverse Effect of valproate that bothers women is: **A.** Weight loss **B.** Weight gain **C.** Hair loss **D.** B & C are correct	68.0%	32.0%	**D**
Q-28: Which of these anti-epileptic drugs can cause polycystic ovary syndrome? **A.** Carbamazepine **B.** Levetiracetam **C.** Valproate **D.** Primidone	53.6%	46.4%	**C**
Q-29: Which of the anti-epileptic drug is the safest during pregnancy? **A.** Carbamazepine **B.** Valproate **C.** Levetiracetam **D.** All of the above	51.7%	48.3%	**C**
Q-30: Which of these anti-epileptic drugs safe on lactation? **A.** Levetiracetam+lamotrigine **B.** Carbamazepine+lamotrigine **C.** Carbamazepine+valproate **D.** Levetiracetam+risperidone	54.9%	45.1%	**C**

50.0% answers carbamazepine which is correct. Q-27, about the adverse effects of valproate that bothers the women, 68.2% answered weight gain and hair loss while 22.3% answered weight gain only. 53.9% agreed valproate can cause polycystic ovary syndrome while others disagreed in Q-28. In

Q-29, 52.1% answered levetiracetam is the safest drug during pregnancy while 29.5% answered valproate which could lead to the risk of disabilities such as spina bifida is 10.0%, while in Q-30, 55.2% answered carbamazepine and valproate are safe during lactation.

Discussion

Libyan pharmacists are knowledgeable regarding certain aspects of epilepsy. The answers to the general question of epilepsy by community pharmacists were acceptable, because every pharmacist, with continuous study and research, must have sufficient information and how to treat them, to increase efficiency and experience that enables them to deal with the patient [7]. The participants showed a poor knowledge about antiepileptic drugs with about 50.0%. It is found that few community pharmacists preferred to leave some of the questions unanswered instead of giving incorrect answer, may due to large group of them were satisfied with dispensing epilepsy drugs as they are with the prescription and thus we conclude that pharmacists must take sufficient information on some diseases and cure it [8, 9]. These findings indicate the need for a better education of pharmacists regarding epilepsy and its treatment. Valproate can cause a decrease of vitamin D and the patient must constantly conduct the necessary tests to be sure that is in the normal range [8]. Thus, patient must be given the appropriate dose and be careful not to increase it in the body. Vitamins are necessary, but increasing it can lead to risks. In contrast, patient on carbamazepine, it may see the patient accepting his condition and the treatment he is taking [9]. Unlike oxcarbazepine, which can cause an improvement in the sexual function [10]. Accordingly, it should not be given to women who want to have children or to females at young ages, except in cases where the treatment is not beneficial only with this drug [11]. About 35.0% of babies exposed to the drug delays in their early development such as talking, walking, have low intellectual abilities, poor language skills and memory problems [12]. Carbamazepine and valproate are safe during lactation, which can be excreted with breast milk, but in small quantities that do not harm the fetus and therefore it is assumed to reduce the dose to the maximum extent to make the patient stable and maintain the health of the fetus [13]. More is needed to investigate the actual factors behind this knowledge gap and propose interventions to improve the pharmacist's knowledge and practice to enhance the quality of health care provided for the patients. A recent study was conducted in Khartoum University, Sudan, about knowledge of pharmacists about anti-epileptic drugs in a developing country, the results indicated that the majority have poor knowledge and only few had good knowledge. Further research is needed to investigate the actual factors behind this knowledge gap and to propose interventions to improve pharmacist's knowledge and practice to improve the quality of healthcare provided to the patients [14].

Conclusion: Most of community pharmacists have poor knowledge about anti-epileptic drugs. Further study is needed to reveal the reasons led to this gap. A continuous training to enable the stakeholders to implement the needed interventions to improve the pharmacist's knowledge and subsequently improve quality of health care provided to patients in Libya.

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Ethical issues: Including plagiarism, informed consent, data fabrication or falsification and double publication or submission have completely been observed by authors.
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