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Impacts of the international economic sanctions on Iranian patients with epilepsy☆

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ABSTRACT

Purpose: On May 8, 2018, the United States announced that it was withdrawing from the Iran nuclear deal. This has resulted in reimposition of the economic hardship on Iran. We investigated the patients' perceptions of hardship in obtaining their antiepileptic drugs (AEDs) after the reimposition of sanctions.
Methods: We surveyed patients with epilepsy visiting three centers in Iran on February 2nd to 6th (easy sampling) on their perceptions on two issues:

1. What has been your experience on obtaining your AEDs in the past six months?
2. Have you experienced any changes in your seizure control in the past six months?

Results: Two hundred and forty-four patients participated. Ninety-two patients (37.7%) claimed that they have had significant difficulty obtaining their AEDs, and 37 patients (15.2%) said that their AED(s) was not accessible. Ninety-six people (72%) of those receiving imported AEDs and 33 patients (30%) of those receiving homemade AEDs had significant hardship obtaining their drugs ($p = 0.00001$). Forty-seven patients (36%) of those who reported significant hardship obtaining their AEDs and 25 (22%) of those who did not, perceived worsening of their seizures ($p = 0.017$).
Conclusion: Sanctions have affected ordinary people, especially those who are vulnerable the most (i.e., patients), significantly.

1. Introduction

Epilepsy is a common chronic neurological disorder affecting almost 0.7% of the populations [1]. The mainstay of treatment in patients with epilepsy is antiepileptic drug (AED) therapy [2]. Daily medication regimen with AED(s) is crucial for patients with epilepsy, and nonadherence to this strategy may have significant consequences (e.g., status epilepticus and death). In a previous study in 2015, we observed that there was an increase in the number of patients who reported poor drug adherence due to high drug price and lack of drug availability as a result of increased intensity of the international economic sanctions against Iran [3]. In 2015, Iran and six of the world powers reached to an agreement that resulted in easing some of the economic and financial sanctions on Iran [4]. However, on May 8, 2018, the United States announced that it was withdrawing from the deal [4]. This has resulted in reimposition and intensification of the economic hardship on Iran.

The aim of the current study was to investigate the patients' perceptions of hardship in obtaining their AEDs and if this has resulted in change in their seizure control after the reimposition of the economic sanctions on Iran.

2. Methods

In this study, we surveyed patients with epilepsy visiting three centers in Iran (Shiraz in the south, Tehran in the north, and Ahvaz in the

☆ The authors conducted the statistical analyses.

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southwest) on February 2nd to 6th (easy sampling), on their perceptions on two issues:

1. What has been your experience on obtaining your AEDs in the past six months (compared with before)?
2. Have you experienced any changes in your seizure control in the past six months?

We included all patients and their caregivers (in case of children and those with intellectual disabilities) if they had epilepsy for more than 12 months. They anonymously answered to the above questions in a multiple choice questionnaire, if they agreed to participate (consented orally). Hardship was defined as either having significant difficulty (scarcely accessible) obtaining their AEDs or AED(s) not being accessible and their physician had to change their drug regimen. We performed univariate analyses using Pearson Chi-square test. p value less than 0.05 was considered as significant. The Shiraz University of Medical Sciences Review Board approved this study.

2.1. Role of the funding source

Shiraz University of Medical Sciences had no role in the study design; in the collection, analysis, and interpretation of data; in the writing of the report; and in the decision to submit the paper for publication.

3. Results

Two hundred and forty-four patients participated in our study (90 patients from Tehran, 77 from Ahvaz, and 77 people from Shiraz). The demographic characteristics of the patients are shown in Table 1. The drug regimens of the patients are shown in Table 2.

In response to the first question (what has been your experience on obtaining your AEDs in the past six months?), 33 patients (13.5%) said that they have obtained their AEDs easily and without hardship (with a reasonable price); 88 patients (33.6%) said that they have done so easily but at a dramatically higher prices; 92 patients (37.7%) claimed that they have had significant difficulty (scarcely accessible) obtaining their AEDs (considered as significant hardship); and finally, 37 patients (15.2%) said that their AED(s) was not accessible, and their physician had to change their drug regimen (considered as significant hardship). One hundred and thirty-four patients (55%) were taking one or more imported AEDs (e.g., Tegretol, Depakine, Orfiril, Epilim, Ethosuximide, Vigabatrin, Keppra, Topamax, and Liskantin), and 110 people (45%) were taking Iranian-made AEDs (e.g., phenobarbital, carbamazepine, valproate, levetiracetam, lamotrigine, topiramate, acetazolamide, oxcarbazepine, phenytoin, zonisamide). The source of AED (i.e., imported vs. homemade) significantly influenced the answers to the first question; 96 people (72%) of those receiving imported AEDs and 33 patients (30%) of those receiving homemade AEDs had significant hardship obtaining their drugs ($p = 0.00001$; two-sided). Forty-seven patients (36%) of those who reported significant hardship obtaining their AEDs (out of 129 patients) and 25 (22%) of those who did not (out of 115 patients) perceived breakthrough seizures or worsening of their seizures ($p = 0.017$; two-sided).

Table 1
Demographic characteristics of the patients.

Gender	Males: 133/Females: 111
Age at onset of their epilepsy	8 ± 10 years (minimum = 0 and maximum = 68 years)
Current age	15 ± 13 years (minimum = 1.5 and maximum = 69 years)
Duration of their epilepsy	8 ± 8 years (minimum = 1 and maximum = 47 years)

Table 2
The drug regimens of the patients.

Monotherapy/polytherapy	105 (43%)/139 (57%)
Imported/homemade drugs	134 (55%)/110 (45%)
Acetazolamide	5 patients
Clobazam	42 patients
Clonazepam	13 patients
Carbamazepine/Tegretol	28 patients/38 patients
Ethosuximide	9 patients
Lamotrigine	29 patients
Levetiracetam/Keppra	64 patients/3 patients
Nitrazepam	9 patients
Oxcarbazepine	3 patients
Phenobarbital	42 patients
Phenytoin	6 patients
Primidone/Liskantin	5 patients/15 patients
Topiramate/Topamax	25 patients/12 patients
Valproate/Depakine/Epilim/Orfiril/Orlept	44 patients/63 patients/12 patients/5 patients/2 patients
Vigabatrin	9 patients
Zonisamide	2 patients

All the drugs in Table 2 were available in the market before the sanctions. Vigabatrin, Ethosuximide, and Zonisamide were not available after the sanctions. Depakine and Tegretol were scarcely available, among some other drugs (e.g., Liskantin, Epilim, Orfiril).

4. Discussion

In this study, we observed that many patients with epilepsy (53%) expressed significant hardship and frustration obtaining their drugs during the past six months and after reimposition and intensification of the economic sanctions on Iran. More importantly, many patients expressed that their conditions have deteriorated during this time period. Based on our personal observations, some news websites, and survey of pharmacies, after the reimposition of the economic sanctions, some drugs (e.g., ethosuximide, vigabatrin, and zonisamide) were not available in the market. In addition, some other widely used imported drugs (e.g., Tegretol and Depakine) were scarcely available. In addition, the prices increased dramatically, sometimes more than 250% in the black market [5,6]. Besides, when patients were under good control with a drug for some time, it was very disturbing for them to be forced to switch to another name (drug), even if it was explained to them that they are the same active drugs (personal observations). A similar issue was reported by others including those with hemophilia or cancer [7,8]. Following the new round of sanctions, Iranian pharmaceutical market has faced significant difficulties to import finished products and raw materials (active ingredients) [9]. In spite of the claim that medicines are exempted from the sanctions, in reality, because of restrictions on money transactions and other financial barriers, imports of goods (including drugs and raw pharmaceutical materials) to Iran are restricted; pharmaceutical companies and financial institutions act very cautiously in doing business with Iran [10]. This has affected ordinary people, especially those who are vulnerable the most (i.e., patients), significantly; sanctions have compromised resources in a country that already lacks resources [8]. In addition, sanctions have jeopardized medical research and science in Iran [11].

Purely from a clinical and patient care perspective, it is necessary that politicians on both sides facilitate decisions that make the health and well-being of ordinary people more affordable and without hardship [3].

This study has some limitations including its retrospective design that may cause recall bias. Moreover, patients did not routinely keep a seizure journal (diary), and the changes in their seizure frequency were based on their recall and estimate. Finally, patients were asked to rate their difficulties 'compared with before' the sanctions, which could have elicited a politically motivated answer.

Conflicts of interest

Ali A. Asadi-Pooya, M.D.: Honoraria from Cobel Daruo; Royalty: Oxford University Press (Book publication). Others: none.

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