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Brief Communication

Incidence of anxiety in epilepsy during coronavirus disease (COVID-19) pandemic

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Abstract

Purpose: The coronavirus disease 2019 (COVID-19) pandemic has affected people globally, and people with chronic diseases are suffering more in maintaining their mental and physical health.

Method: This cross-sectional, case–control study assessed the anxiety level in people with epilepsy compared with the general population.

Results: The results showed that 13.5% of patients had experienced a severe level of anxiety, but the mean anxiety level between groups did not show significant difference.

Conclusion: Although still many aspects of the pandemic on people with epilepsy are yet to be determined, active investigation of psychological sequels of the pandemic is demanded.

Keywords:
Epilepsy
Seizure
Anxiety
Coronavirus disease
Pandemic

1. Introduction

Epilepsy is a chronic neurologic disease that has affected around 50 million people worldwide. Depression and anxiety are the most common neuropsychiatric comorbidities in people with epilepsy. The pooled prevalence of anxiety among people with epilepsy has found to be 20.2% with more incidence in patients with drug-resistant epilepsy [1]. Based on the diagnosis method, there may be considerable variance in the incidence of anxiety and other neuropsychiatric disorders among people with epilepsy [2,3]. However, the impact of anxiety on patients’ quality of life, seizures’ control, and treatment response are significant [4,5].

The coronavirus disease 2019 (COVID-19) was declared a pandemic in the mid-March 2020. Pandemics are major worldwide health crises, possessing potential and serious risks to not only physical but also psychological health. Besides the fact that people with chronic diseases may experience more from the severe form of the disease [6], they also may face more challenges regarding maintaining their routine medical care for their underlying condition.

Considering the complications of anxiety in the overall health quality of these patients, especially during crisis, this study was conducted to assess the anxiety level in people with epilepsy compared with the general population during COVID-19 pandemic to enlighten the challenges and solutions for better care in people with epilepsy.

2. Method

This study is a cross-sectional, case–control survey approved by the Iran National Committee for Ethics in Biomedical Researches (IR.SBMU.RETECH.REC.1399.155) to assess the level of anxiety among people with epilepsy as compared with the general population in the time of COVID-19 pandemic. The anxiety level was assessed by the Beck Anxiety Inventory II-Persian (BAI-II) in Persian language, which was validated previously [7]. In order to reduce the risk of a person-to-person transmission, the questionnaire was broadcasted on a web-based platform among the participants. The questionnaire was sent to all patients who were being followed up in two referral clinics at Shahid Beheshti and Isfahan Universities of Medical Sciences. Complete description of the study was provided to participants before entering the survey by telephone call. The patients who had any medical history of psychosis or a Mini-Mental State Examination (MMSE) score of $\leq 12$ were excluded from the study [8]. For the control group, the questionnaire was broadcasted over Wechat public messenger platform, commonly used in the country. History of any neurologic diseases was the exclusion criteria for the control group [9]. Statistical analysis was performed via
IBM® SPSS® Statistics software (version 25.0). The significance level was defined as 0.05.

3. Results

In total, 141 subjects with epilepsy and 759 subjects in the control group after matching their age and gender were included in the study. The demographic data as well as disease- and COVID-19-related variables are provided in Table 1.

The mean BAI-II total score among the patient and control group was 11.82 ± 9.71 and 10.28 ± 8.98, respectively, with no statistically significant difference. Based on the total BAI-II score, 13.5% of patients and 11.82 ± 9.71 and 10.28 ± 8.98, respectively, with no statistically significant difference among the patient and control groups. Most of patients and the controls experienced minimal level of anxiety, which was statistically significant different between the patient and control groups.

In our study, only four patients had confirmed COVID-19 infection. In contrast to the patient group, the severity of anxiety in the control group was related to being infected with COVID-19. In both groups, the anxiety level was higher if one of the relatives had been infected with COVID-19. The sleep pattern and appetite change were seen mostly in participants who have experienced more severe anxiety.

During the pandemic, 3.6% of patients reported exacerbation in their symptoms, and 6.8% of them reported an increase in their medications. There was no correlation between epilepsy duration, epilepsy type, and severity of anxiety, age, and gender in the patient group.

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In total, 13.5% of patients and 6.9% of controls have experienced severe level of anxiety, which was significantly different. Based on the total BAI-II score, 13.5% of patients and 11.82 ± 9.71 and 10.28 ± 8.98, respectively, with no statistically significant difference among the patient and control groups. Most of patients and the controls experienced minimal level of anxiety, which was statistically significant different between the patient and control groups.

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Table 2 provides more details about the patient group characteristics.

4. Discussion

Our findings suggested that the anxiety level of people with epilepsy is not significantly higher than the general population without epilepsy. A recent study that assessed the anxiety level in people with epilepsy reported significantly higher anxiety level among patients in contrast to the general population [10]. This discrepancy in findings may be related to background situation of COVID-19 pandemic in the regions where the studies were conducted, facilities in the national healthcare systems provided to people with epilepsy, or a higher anxiety level among the general population. A recent study conducted to assess the anxiety level in Iranian general population showed similar pattern of anxiety in the general population to our study; however, the underlying medical conditions including epilepsy was not determined in the study [11].

In this survey, participants with epilepsy and other chronic conditions experienced more anxiety compared with people with epilepsy with no other chronic conditions. This finding may be the consequence of the public awareness that people with chronic conditions may have more severe anxiety compared to people without any chronic conditions. Although seizure as a manifestation of COVID-19 has been reported [12,13], there is no evidence of increased tendency for people with epilepsy to develop COVID-19 infection.

In accordance with other chronic conditions' challenges regarding maintaining routine medication adherence [09], our study showed that one in five people with epilepsy declared experiencing difficulties in accessing their routine epilepsy medication(s) in the pandemic crisis. Also, 6.3% of patients had increased their medication dosage since the pandemic.

Of the 500 patients who were sent a questionnaire, only 141 answered. Therefore, although our results did not show increase total level of anxiety among patients with epilepsy compared with the general population, severe anxiety was significantly higher in people with

| Table 1 | Demographic-, COVID-19-, and anxiety-related characteristics of patients and controls. |
|---------|--------------------------------------------------------------------------------------|
| **Demographic information** | Patients | Control | P-value |
| Mean age (year) | 36.01 ± 19.78 | 36.08 ± 17.70 | 0.825 |
| Gender (M/F) | Male (%) | Female (%) |
| | 44.6 | 55.4 |
| Level of education | Patients (%) | Control (%) |
| Illiterate | 4.2 | 6.4 |
| Primary school | 23.4 | 24.4 |
| High school diploma | 28.4 | 29.2 |
| Associate’s degree | 8.5 | 9.3 |
| Bachelor’s degree | 25.5 | 33.5 |
| Master’s degree | 9.2 | 15.4 |
| Doctoral degree | 0.7 | 11.7 |

| COVID-19-related questions (%) | | | |
| Infected by COVID-19 | 2.1 | 2.5 | 0.539 |
| Family members infected by COVID-19 | 12.0 | 21.2 | 0.004 |
| Sleep problems since COVID-19 pandemic | 20.5 | 25.4 | 0.011 |
| Appetite change since COVID-19 pandemic | 8.5 | 16.8 | 0.001 |

| BAI-II results | | | |
| Mean BAI-II total score | 11.82 | 10.28 | 0.067 |
| Anxiety severity | No anxiety (%) | Mild anxiety (%) | Moderate anxiety (%) | Severe anxiety (%) |
| | 45.4 | 25.5 | 15.6 | 13.5 |
| | 48.7 | 29.1 | 15.3 | 6.9 |

| Table 2 | Epilepsy-related characteristics of patients. |
|---------|--------------------------------------------------------------------------------------|
| Disease duration (year) | Less than 5 (%) | 32.8 |
| | 5–10 (%) | 35.8 |
| | More than 10 (%) | 31.4 |
| Epilepsy type | Focal-onset (%) | 29.8 |
| | Generalized-onset (%) | 59.6 |
| | Unknown (%) | 10.6 |
| Last seizure | In the last 4 months (%) | 36.9 |
| | Last 4–12 months (%) | 20.6 |
| | More than 1 year ago (%) | 40.9 |
| Hospital admission due to seizure in the pandemic (%) | 6.4 |
| Believe that COVID-19 pandemic has exacerbated your epilepsy symptoms (%) | 3.5 |
| Inaccessibility to means of ordering medications during COVID-19 pandemic (%) | 21.2 |
| Increased epilepsy medication during COVID-19 pandemic (%) | 6.3 |
| Preexisting medical condition (rather than epilepsy) | | |
| Hypertension (%) | 7.0 |
| Hypothyroidism (%) | 2.8 |
| Hyperlipidemia (%) | 2.8 |
| Asthma (%) | 2.1 |
| Obesity (%) | 1.4 |
| Diabetes (%) | 0.7 |
| Rheumatoid arthritis (%) | 0.7 |
| Epilepsy medications | | |
| Sodium valproate (%) | 43.3 |
| Levetiracetam (%) | 41.8 |
| Carbamazepine (%) | 32.6 |
| Lamotrigine (%) | 19.1 |
| Phenoobarbital (%) | 12.1 |
| Oxcarbamazepine (%) | 7.0 |
| Phenytoin (%) | 5.7 |
| Topiramate (%) | 5.7 |
| Cllobazam (%) | 4.3 |
| Primidone (%) | 2.8 |
| Acetazolamide (%) | 2.1 |
| Ethosuximide (%) | 2.1 |
| Other medications | | |
| Antihyperperensive (%) | 7.0 |
| Selective serotonin reuptake inhibitor (%) | 5.6 |
| Benzodiazepine (%) | 4.9 |
| Thyroid medication (%) | 4.2 |
| Antihyperperidipemic (%) | 3.5 |
| Asthma drugs (%) | 2.1 |
| Aspirin (%) | 2.1 |
| Risperidone (%) | 0.7 |
| Tricyclic acid (%) | 0.7 |
epilepsy. On the other hand, patients with lower educational level, lower socioeconomic condition, and older age who seemed to be more prone to the consequence of pandemic did not answer to the questionnaire.

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Declaration of competing interest

None.

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