Suicide in two patients with epilepsy and cystic degeneration areas of their brains

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Abstract: Suicide is an important cause of death among patients with epilepsy. In this report, we describe two patients with epilepsy whose brain examinations revealed cystic degeneration areas.

The first case was a 42-year-old man who had been treated for epilepsy for five years. It was reported that his epilepsy attacks had increased over the six months prior to his suicide, and that he had severe conflicts with his wife during the last two months. He committed suicide by hanging. An autopsy revealed two cystic degeneration areas on the left temporal lobe, and one cystic degeneration area on the right parietal lobe.

The second case was a 30-year-old man who had been receiving epilepsy treatment for 10 years. It was reported that his epilepsy attacks had increased in the four months prior to his suicide, and his wife had left home because of continuous arguments. He committed suicide by drinking rodenticide (aluminum phosphide). An autopsy revealed a cystic degeneration area on the right temporal lobe.

Neither of the two cases had a history of head injury, and the cystic areas are evaluated as border zone infarcts due to prolonged hypoxemia caused by recurrent status epilepticus attacks. In conclusion, in case of the determination of the cystic degeneration areas in patients with epilepsy in computed tomography or magnetic resonance imaging examinations, it will be beneficial to follow these patients in terms of epileptic attacks and psychiatric defects.

Key Words: epilepsy, suicide, cystic degeneration.

Epilepsy affects nearly 1% of the global population and it is a condition of diverse etiologies [1]. It was suggested that, among epileptic patients, risk of suicide or suicide attempts were higher [2–6]. Among individuals with epilepsy, studies reported up to five times increased risk of suicide [7–9].

Strong association between epilepsy and psychiatric disease is well known [10], and one of the strongest risk factors for suicide is psychiatric illness [11]. The most frequently encountered psychiatric disorders in epileptic patients are depression and anxiety [12, 13]. It is reported that the severity of anxiety and depression is higher in epileptic patients than in control groups [12, 14].

In this study, two suicide cases of epileptic patients whose brains had cystic degeneration areas are presented.

CASE REPORTS

Case 1

The first case was a 42-year-old man who had been treated for epilepsy for five years. It was reported that his epilepsy attacks had increased in the six months prior to his suicide and that he had severe conflicts with his wife during the last two months. According to the

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information obtained from his family, the patient was very aggressive during the last six months and was continuously quarrelling with his family. Within the last two weeks, he tried to commit suicide three times and his relatives removed the rope with which he wanted to hang himself. Since the victim was an illiterate person, he wanted his son to write a farewell letter. He committed suicide by hanging himself from a tree in his garden. The external examination revealed daily axillary and pubic shaving. There was a ligature mark on the neck, in the midline, at the level of the thyroid cartilage. The mark was running on both sides of the neck, at the back merging with the hairline. There were common petechial hemorrhages on the internal side of the scalp and ecchymoses on the base of the tongue in the internal examination. In all internal organs there were common asphyxial findings. On the left temporal lobe of the brain, two cystic degeneration areas, approximately measuring 2 x 1 x 0.2 cm, and 1 x 0.6 x 0.2 cm, and on the right parietal lobe one cystic degeneration area of 1 x 1 x 0.5 cm, were observed (Figures 1 and 2). Toxicological analysis was negative.

**Case 2**

The second case was that of a 30-year-old man who had been receiving epilepsy treatment for 10 years. His epilepsy attacks had increased in the four months prior to his suicide, and his wife had left home because of continuous arguments. He committed suicide by drinking rodenticide (aluminum phosphide). During the crime scene examination, an empty rodenticide box, a farewell letter, and some money left for grave clothes were found. As with the previous case, the external examination revealed daily axillary and pubic shaving. Upon internal examination, one cystic degeneration area of 5 x 4 x 0.2 cm was observed on the right temporal lobe of the brain (Figure 3). There was congestion of all organs and the lungs were edematous. There were 100 mL grayish, pasty material with a nauseating garlicky odor in the stomach.

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**Figure 1.** Two cystic degeneration areas on the left temporal lobe (Case 1).

**Figure 2.** A cystic degeneration area on the right parietal lobe (Case 1).

**Figure 3.** A cystic degeneration area on the right temporal lobe (Case 2).

**Figure 4.** The cystic areas were devoid of gliotic tissue, consisted of fragile microvessels and hemosiderin laden macrophages (HE, x40).
There was not remarkably congestion in the mucosa and sloughing was observed. It was observed that rugosities were obliterated in the stomach wall and the wall was thinned out. Aluminum phosphide was determined in toxicological analysis.

**Common features of the cases**

On microscopic evaluation, the cystic areas of the brains of both cases were wedge shaped with their base at the pial surface, they were devoid of gliotic tissue, consisted of fragile microvessels and hemosiderin laden macrophages (Figure 4).

The socio-economic levels of both victims were low. They were using diphenylhydantoin for epilepsy treatment. Since they did not regularly attend follow-up examinations, there was not enough information on the efficiency of the treatment. Neither of the cases underwent computed tomography or magnetic resonance imaging examinations, and neither had a history of head injury.

**DISCUSSION**

The four major causes of death among people with epilepsy are 1) accidents (mostly drowning), 2) sudden unexpected death, 3) suicide, and 4) status epilepticus. Prevention of suicide and sudden unexpected death is still difficult in spite of appropriate antiepileptic medication [6].

It was reported that in chronic diseases, the frequency of depression and anxiety increases [15, 16]. There are several hypotheses for explaining the excess of suicide rates in patients with epilepsy, psychiatric comorbidity, and especially depression, as well as iatrogenic factors being the most common risks [17]. Depression and anxiety levels are higher in people with epilepsy because of unexpected timing of the seizures, and societal stigma attached to epilepsy [18]. Retrospective studies reported that the majority (81–100%) of suicides occur in patients with a psychiatric illness (most common depression) [19]. It was reported that depression occurs in 62% in certain epilepsy populations [20].

Psychiatric disorders are not frequently diagnosed and treated in epileptic patients [21, 22]. Only one third of the patients with psychiatric disorders receive treatment [22]. The treatment rate is lower in Turkey, because many families are unwilling to chase psychiatric help. Therefore control of psychiatric disorders in epileptic patients is more difficult. As the epilepsy has a chronic nature and psychiatric disorders in these patients can lead to death, clinicians should keep in mind the signs of accompanying mental disorders in epileptic patients, and necessary precautions should be taken in the early period [18]. Both of the cases in this study did not attend regular follow-up examinations, so their psychiatric examination could not be performed. However, according to the information obtained from their relatives and farewell letters, depression may be suggested for their psychiatric diagnosis.

It was noted that there was a male preponderance in epilepsy patients about suicide [6, 23]. Both victims were male in this study.

Most authors agree that the suicide risk is particularly high in patients with temporal lobe epilepsy (TLE) [2, 4, 6]. In a study about epilepsy and suicide, there was statistically significant difference by epilepsy type among the epilepsy patients, with TLE was most associated with death. Further, suicide was only encountered in patients with TLE and the association was statistically significant [6]. Both of our cases had cystic degeneration areas in their temporal lobes, suggesting that the type of epilepsy was TLE.

In the risk of suicide, demographic and socioeconomic factors play a part [24, 25]. Compared with the general population, epilepsy patients have lower socioeconomic conditions and quality of life. Whether these factors modify the risk of suicide in epilepsy patients has not been studied [26]. It was thought that because the victims in this study were in a low socioeconomic status, they did not go to their regular follow-up examinations.

It was reported that the presence of daily pubic and axillary shaving of the Muslim victim, could be considered as a feature of suicide [27]. Both of the cases had daily pubic and axillary shaving, so this finding supports suicide as the manner of death.

We do not have specific data to show the etiology of the cystic degeneration areas defined in our cases. It was reported that seizures may cause brain injury via a variety of mechanisms in epileptic patients [28]. Prolonged status epilepticus is one of the principal causes of hypoxemic hypoxia (low O2 content in blood) of the brain [29]. So, these cystic degeneration areas may develop as a result of epileptic fits. They may be evaluated as border zone infarcts due to prolonged hypoxemia caused by recurrent seizures. However, they may also be effective in the occurrence of the epilepsy attacks and psychiatric disorders. Therefore, there may be vicious circles that trigger each other.

As a conclusion, it has been thought that in case of the determination of the cystic degeneration areas in patients with epilepsy in computed tomography or magnetic resonance imaging examinations, it will be beneficial to follow these patients in terms of epileptic attacks and psychiatric defects.

**References**