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Difficulty in diagnosis; epileptic deaths
Zor Tanı; Epileptik Ölümler

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ÖZET

Epileptik kişilerde genel nüfusa oranla ani beklenmedik ölüm insidansı daha yüksektir. Epilepsi tekdüze bir klinik tablo değildir ve erken ölüm oranı büyük ölçüde altta yatan etiyolojik faktörlere bağlıdır. Epilepsi olgularında mortalite epilepsiye bağlı ölümler ve epilepsi ile ilgisiz ölümler olarak sınıflandırılabilir. Epileptik hastada ani beklenmedik ölüm (EHABÖ) , epileptik atak ,ve epileptik hastada intihar ve kazalar epilepsi ile ilgili olarak kabul edilir. Bu çalışmada, ölüm nedeninin ve orijininin belirlenmesi için 2000 ve 2005 yılları arasında Adli Tıp Kurumu Birinci İhtisas Kurulu'na gönderilen olguların tüm dosyaları incelenmiştir. 28 olgunun ölüm nedenleri son bilgilere göre yeniden değerlendirildi. Çalışmaya dahil olan 28 olgunun 18'i erkek ve 10'u kadındı, olguların yaş ortalaması 29 idi . Sonuç olarak 20 vakanın ölümünün EHABÖ olduğu dört vakanın ise epilepsi atağına (n=4)bağlı öldüğü tespit edildi.

Çalışmamızın amacı, epileptik olan kişilerde ölüm nedenleri ve mekanizmalarını otopsi bulguları, tıbbi belge ve ölümün meydana geldiği koşullara göre tespit etmektir.

Anahtar kelimeler: epilepsi, ölüm, adli tıp

ABSTRACT

People with epilepsy have an increased incidence of sudden unexpected death compared with the general population. Epilepsy is not a uniform clinical presentation and the ratio of premature mortality largely depends on the underlying etiologic factors. Mortality in cases with epilepsy can be classified as deaths attributable to epilepsy and unrelated deaths with the epilepsy. Mortality as sudden unexpected death in epileptic patients (SUDEP), status epilepticus (SE), suicide, and accidents are considered to be epilepsy-related. In this study, we examined all files of the cases sent to the First Specialization Board of the Council of Forensic Medicine between the 2000 and 2005 for determination of the cause and the manner of death. The causes of deaths of 28 cases were re-evaluated according to the recent information. Of the 28 cases included in study 18 were male and 10 were female, the mean age was 29. As a result we have defined that 20 cases had died as SUDEP and four cases were SE (n=4). Remaining deaths were due to conditions possibly related to epileptic disease according to their previously recorded medical history and documents of postmortem examination and investigation.

The aim of our study was to detect the reasons and mechanisms of death in persons with known epilepsy according to the autopsy findings, the medical documents and the situations in which death occurred.

Key Words: epilepsy, death, forensic medicine.

Introduction

Epilepsy is a clinical situation originated from the augmented excitability of the neurons of the brain (neuronal hyper-excitability) and the risk of death for a person suffering from epilepsy is increased compared with the risk for general population [1-5].

Commonly used definition of SUDEP is "The sudden, unexpected, witnessed, non-traumatic and non-drowning death in a patient with epilepsy, with or without evidence for a seizure and excluding convulsive status epilepticus in which post-mortem examination does not reveal a toxicological or anatomical cause for death" [6-8].

Risk of SUDEP appears to correlate with the severity of the epilepsy. SUDEP appears to be a seizure-related event. It commonly occurs during sleep. Iinvestigators reported the prone position more frequently than statistically expected. The prone position could obstruct the nose and mouth against bed clothing and reduce vital capacity and tidal volume during the recovery phase of a seizure. In our study, 25% of cases were found on a bed at prone position [9, 10].

The cause of SUDEP is not fully understood and is likely to be multifactorial. There remain a number of unanswered questions regarding SUDEP, a seizure-related phenomenon that is attributed as the cause for many deaths in young people with epilepsy [11]. In this study, we didn't find any definite feature to clarify these questions.

In our study, we want to emphasize that determining the cause of death of any cases with epilepsy is really depends on existence of reliable medical records of premortem period and last treatment just before the death occurred and detailed autopsy records. In addition to these, performing the autopsy by experienced staff and providing the histopathological and toxicological analysis of deceased's samples are seriously important matters which are recently acquired procedures in Turkish Justice System. The aim of our study was to detect the reasons and mechanisms of death in persons with known epilepsy according to the autopsy findings, the medical documents and the situations in which death occurred.

Materials and Methods

The material for this report consists of cases sent to the Council of Forensic Medicine between 2000 and 2005. In total, 28 cases were obtained. Cases are assessed by means of age, sex, medical documents, autopsy findings, findings of crime scene inspection.

Results:

Causes of death were searched in total 28 patients with known epilepsy by way of their medical history, their causes of death were given by the The First Speciality Committee between 2000-2005 at the Council of Forensic Medicine; Of the cases, 18 were men, 10 were women, mean age was 29, being the youngest at 5 and the oldest at 55. Cause of death was SUDEP in 20, status epilepticus in 4, other reasons thought to be related with epilepsy in the rest 4 cases (Graphic 1).

It is recorded in the medical documents that 10 of SUDEP cases had generalized tonic-clonic (GTC) convulsions. 8 of SUDEP cases were found dead in their bed, 5 of which were in prone position. 1 SUDEP case is seen to have convulsion during sleeping and dead just afterwards. 14 out of 20 SUDEP cases were exposed to autopsy, the rest 6 were not. İn 11 cases exposed to autopsy, older and newly occurred ecchymoses and lacerations were observed at the different parts of their bodies during external examination; auricles, tips of noses and fingers were observed purple in 5 cases.

Traces of bites were detected at the tongues in 8 cases and at the lips in 2 cases. In

most cases, no pathological finding was detected at heart, lungs or brain; in some, bleeding inside the mouth caused by bites, edema of the brain and the lungs were detected during the internal examination of autopsy. Autopsy was done in 3 of 4 cases hospitalized by the diagnosis SE and died while treated in Intensive Care Unit. During the autopsies, ecchymoses of diverse magnitudes were seen externally, and edema of the brain and the lungs, blood in the mouth, nose and trachea as a result of bites were seen internally; histopathological findings detected were serum exudation in the alveolar spaces.

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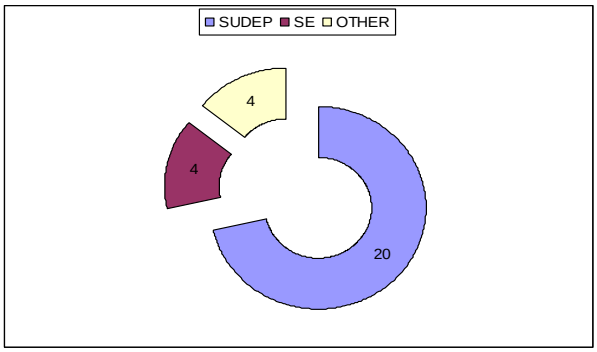
As examples of other causes thought to be related to Epilepsy are; a case who fell down the stairs during the night after alcohol intake; he was dead because of scalp fracture and subarachnoidal bleeding. As it was notified that he was dead of head trauma, ethyl alcohol in his blood was not examined. So, it was not obvious that he fell down the stairs as a result of loss of equilibrium after alcohol intake or an epilepsy crisis; Pneumonia is detected in 3 cases during the autopsy, but as the agents were not mentioned, it was not possible to differentiate if the cases had already pneumonia or they had aspiration pneumonia developed after the crisis.



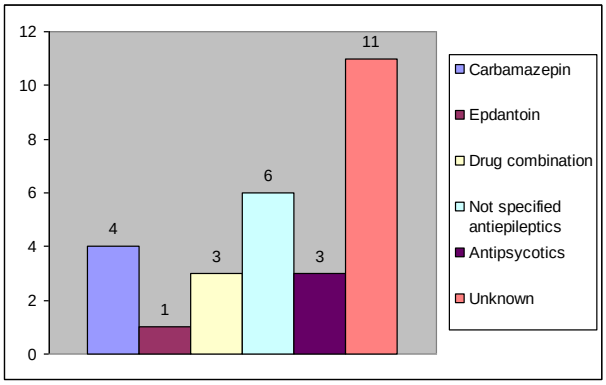
Graphic 1. Causes of death in epilepsy patients

As we enquire the 24 cases by means of the drugs they were taking; 14 cases were taking antiepileptic drugs: 4 were taking Carbamazepine (CBZ), 1 was taking Epdantoin, 3 were taking more than one drug. It was registered that it was not known which medications took the 6 cases. In their medical history, Organic Personality Disorder, Psychosis and Mental retardation were noted in 3 of these cases and they were using antipsychotic drugs. It was registered that 5 cases were not taking their drugs because of some reasons. It was not possible to detect if the other cases were taking any antiepileptic drugs by way of available records (Graphic 2).

It was registered that recently the frequency of epilepsy crisis were higher in 6 cases.

As the EEGs were examined, seen within the medical documents sent to the Council to determine the causes of deaths, Findings were normal in 2 cases, focal deceleration were

determined in 2 cases, and activity of crisis were determined in 2 cases.



Graphic 2. Drug intake of cases

In their medical history, Organic Personality Disorder, Psychosis and Mental retardation were noted in 3 of these cases and they were using antipsychotic drugs. It was registered that 5 cases were not taking their drugs because of some reasons. It was not possible to detect if the other cases were taking any antiepileptic drugs by way of available records.

Discussion:

Epilepsy is not a uniform condition, and the likelihood of premature mortality often depends on the etiology. Deaths due to sudden unexpected death in epilepsy (SUDEP), status epilepticus (SE), suicide, and accidents are considered to be epilepsy-related.

The incidence of SUDEP depends on the population studied and the methodology employed with the lowest figures being reported in population-based studies. In our study, 20 of 28 epilepsy related death cases were coherent with the defined SUDEP. The cause of SUDEP is not fully understood and is likely to be multifactorial [11]. Verbal autopsy, Information obtained from family and friends is important [12, 13]. Postmortem studies have frequently revealed pulmonary edema, cardiac enlargement, and hepatic congestion. The degree of pulmonary edema, however, was usually considered insufficient to itself result in death [10, 12, 14].

Suggested etiologies include cardiac arrhythmia, autonomic disturbance, hypoxia, and central or obstructive apnea. In our cases, the most conspicuous finding was lung edema[14].

In a study, it was notified that SUDEP cases were mostly found in prone position rather than supine. The prone position could obstruct the nose and mouth against bed clothing and reduce vital capacity and tidal volume during the recovery phase of a seizure[9, 10].

In our study, 8 of SUDEP cases were found dead in their beds and 5 of them were in prone position. Some reports have implicated CBZ in increasing the risk of SUDEP [15, 16]. According to their medical history, 14 cases had antiepileptic drug intake: 4 were taking Carbamazepine, 3 were taking more than one drugs. In most cases, we were not able to obtain certain data about drug intake.

In a study, it is found that the relative risk of SUDEP is increased in proportion to the annual frequency of seizures [17]. In 6 of our cases, we determined that recently the frequency of epilepsy crisis was augmented.

The risk of SUDEP is increased with the frequency of seizures and presence of generalized tonic-clonic seizures [18]. In our study, it was recorded that 10 of the SUDEP cases had GTC type seizures.

SE has an annual incidence of 10-60 per 100,000 in the general population and accounts for between 0,5 and 10% of all deaths in epilepsy [19, 20]. In our study, %14.2 of deaths related to epilepsy were because of SE. In our country, as we have no strictly registered statistical data, we were not able to comment about the percentage we detected.

Accidental deaths related to epilepsy are commonly due to trauma, road traffic accidents, falls, burns, and drowning. Studies have reported for accidental deaths between 2,4 and 5,6. Drowning is thought to be a common cause of fatal accidents in people with epilepsy [21-25]. A Canadian study of 482 deaths from drowning found that 25(5%) were directly related to seizures [26].

In our study, there was only 1 case which could be related with accident.

To be able to determine the death cause related to Epilepsy, autopsy findings, health status of the dead person, drug intake, dosages, stories of witnesses should be obtained and the way how death takes place should be sought and a detailed examination of crime scene should be done.

As the autopsies of persons diagnosed with epilepsy are featured, it is important that the cases are assessed by means of SUDEP for not to be appreciated as negative autopsies.

We want to emphasize that determining the cause of death of any cases with epilepsy is really depends on existence of reliable medical records and last treatment just before the death occurred and detailed autopsy records. In addition to these, performing the autopsy by experienced staff and providing the histopathological and toxicological analysis of deceased's samples are seriously important matters which are recently acquired procedures in Turkish Justice System.

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