

COMMON ETIOLOGIES OF ADULT ONSET EPILEPSIES IN NORTHWEST OF IRAN

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Abstract- Frequency of common etiologies of adult onset epilepsy is different in various studies. The aim of this study is to evaluate the frequency of common etiologies of late adult onset epilepsies. All patients referred to Razi and Imam Khomeini Hospitals in the year 2003 with at least two seizure attacks beginning after age of 50 were evaluated. In the majority of cases neuroimaging, electroencephalography and echocardiography were done and risk factors for atherosclerosis and cerebrovascular diseases were investigated. All medical records and previous medical histories were reviewed. A total of 97 patients were included. We found hemorrhagic stroke in 10 (10.3%), ischemic stroke in 43 (44.3%) and space-occupying lesion (all of them were tumors) in 19 patients (19.6%). In 24 (24.7%) cases we could not find a clear cause for seizure attacks. In conclusion, since seizures were associated with a central nervous system disease in about 75% of the patients, careful investigation is necessary. We also recommend better control of risk factors for cerebrovascular diseases in our country. *Acta Medica Iranica*, 43(3): 223-226; 2005

Key words: Epilepsy, elderly, Iran, cerebrovascular diseases, brain tumor

INTRODUCTION

Epilepsy can occur at any age and almost a quarter of cases are aged. Some epidemiological studies indicate that incidence and prevalence of epilepsy increases after the age of 60 (1, 2). In the United States, the annual incidence of seizure is approaching 100 seizures per 100,000 people aged over 60 years (3). Like other developing countries, life span has increased in Iran and neurologists are increasingly challenged to provide appropriate management of seizures and monitor antiepileptic drug therapy in their older patients.

In many older patients, an underlying cause of seizure activity is clearly identifiable but frequency of these etiologies is different in various studies. Some authors have reported cerebrovascular accidents

as the most frequent cause for epilepsy in this age group and others have found the brain tumors as the most common cause. Almost 25% of patients with infarction of cerebral cortex later develop recurrent partial or generalized seizures. According to Sung and Chu, previous infarcts are by far the most common lesions underlying status epilepticus in late adult life (4). Other causes include acute symptomatic seizures such as those that happen in the context of an acute insult to the central nervous system (CNS) or during an acute metabolic disturbance (5). These seizures could be associated with subdural hematoma and CNS infections. They also can occur with systemic metabolic conditions such as uremia, hyperglycemia, hypoglycemia, hyponatremia and alcohol withdrawal. Seizures, as a result of Alzheimer and other degenerative diseases are decidedly rare (6).

Some causes of epilepsy like alcohol withdrawal are common in Western world but are of little significant in our country. In this study we evaluated the most common etiologies for adult onset seizures in Tabriz, one of the biggest provinces in north-west of Iran.

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MATERIALS AND METHODS

Our study covered a one-year period, and included all patients who developed seizures after age of 50, referred to Razi and Imam Khomeini Hospitals during the year 2003. This study was conducted in accordance with the guidelines of Declaration of Helsinki.

Patients who had early or immediate seizures after suffering recent trauma and also a few cases of hypoglycemia were excluded. Each patient had at least two seizure attacks in his/her history. Neuroimaging, using computed tomography (CT) scan for all patients and magnetic resonance imaging (MRI) in selected cases, were done. An electroencephalogram (EEG) was obtained for all cases.

History of cerebrovascular diseases (ischemic and hemorrhagic) and important risk factors including diabetes mellitus, hypertension, smoking, hyperlipidemia and ischemic and valvular heart disease were registered from medical recordings and laboratory tests (echocardiography, ECG, *etc.*). Seizures were classified according to International League Against Epilepsy's recommendations. The etiology of epilepsy for each patient classified as space occupying lesion (primary and metastatic tumors and abscesses), ischemic stroke, hemorrhagic stroke, degenerative disease or unknown.

The data were analyzed by SPSS software, version 11. *P* value < 0.05 considered as significant level.

RESULTS

A total of 97 patients met the study criteria. The mean age of patients was 66.5 ± 9.4 years, with minimum of 50 and maximum of 89. Twenty-six (26.8%) were in the age range of 50-59, 31 (32%) in the range of 60-69, 33 (34%) in the range of 70-79 and 7 (7.2%) in the range of 80-89. There were 50 (51.5%) women and 47 (48.5%) men. Stroke history was positive in 50 (51.5%) patients, 41 (82%) with ischemic stroke and 9 (18%) with hemorrhagic stroke. Cerebrovascular risk factors were present in

58 (59.8%) of them, hypertension in 50 (51.5%), diabetes mellitus in 18 (18.6%), hyperlipidemia in 7 (7.2%), ischemic heart disease in 5 (5.2%) and smoking in 2 (2.1%).

Seizure classification showed generalized tonic-clonic seizures in 60 patients (61.9%), complex partial seizures in 2 patients (2.1%) and simple partial seizures in 35 (36.1%) cases. Partial seizures were more frequent in cases secondary to vascular lesions compared to other causes. Of 53 patients with seizures associated with vascular lesions, 27 (50%) had partial seizures but in the groups with seizures associated with tumors or of unknown cause only 10 of 44 patients (23%) suffered partial seizures ($P < 0.02$).

Neuroimaging studies were abnormal in 70 (72.2%) cases. In 42 (43.3%) patients we found an abnormality in EEG. These findings were as follows: epileptiform discharges in 8 (8.2%), focal slowing in 29 (29.9%) and generalized slowing in 5 (5.2%).

According to medical history and imaging studies, we found hemorrhagic stroke in 10 (10.3%), ischemic stroke in 43 (44.3%) and space occupying lesion (all of them were tumors) in 19 patients (19.6%).

In 24 (24.7%) cases we could not find a clear cause for seizure attacks (Fig. 1). We could not find any gross degenerative disease in our patients. Cerebrovascular etiologies were growing by each decade, but the tumor as an etiology for late adult onset seizures had a peak value around 60-69 years and then its frequency declined (Fig. 2).

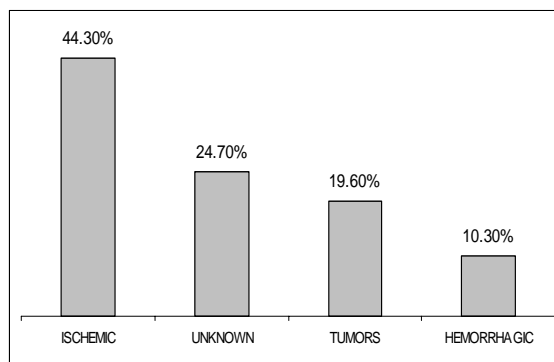


Fig. 1. Frequency of common etiologies of seizure in late adult life.

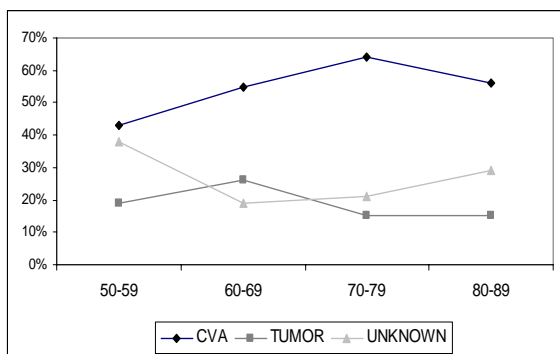


Fig. 2. Frequency of most common etiologies of epilepsy in elderly in different age groups.

DISCUSSION

After cerebrovascular disorders and dementias, epileptic seizures constitute the third most frequent neurologic problem encountered in the elderly. Stroke and brain tumors are the most common etiologies of epilepsy in this age group. A five-year study of 151 patients with a first seizure after 60 years of age found that 32 percent of seizures were caused by strokes and 14 percent by brain tumors, including meningiomas, malignant gliomas, and brain metastases; 25 percent had no identifiable cause (7).

A community cohort study of 675 patients with a first stroke found that the risk of having a seizure was 2 percent at stroke onset and 11 percent in the first five years after the stroke. Seizure recurrence after a stroke can be immediate, or it may not happen for several years. Recurrences are more common after hemorrhagic or severe ischemic strokes with cortical (particularly occipital) involvement and late onset of the first seizure (8).

Our study showed that vascular causes are the most common etiologies for epilepsy in late adult life in northwest of Iran. Ischemic strokes were more common but considering higher incidence of ischemic strokes in general, we conclude that seizure as a delayed sequel of cerebrovascular accidents more commonly is associated with hemorrhagic than ischemic accidents.

Tumors, either primary or secondary, account for 20% to 50% of the cases of seizures occurring for the first time in late adult life (6, 9). Seizure is the first symptom in 30% of brain tumors and is present in up

to 70% of patients at some point during the illness. In adults, a first seizure, particularly if focal, should be evaluated by MRI for an occult brain neoplasm. Seizure frequency varies with histology; 37% of patients with glioblastomas, 65% to 70% with low grade astrocytomas, 75% to 95% with oligodendrogliomas and only 18% with brain metastases suffer from epilepsy (9).

We found partial seizures in 27 of 53 patients (51%) with seizures due to cerebrovascular accidents. In patients with space occupying lesions it was found in 3 out of 19 (18%). Almeida *et al.* showed that partial seizures, which are usually secondary to stroke or brain tumors, are the most frequent type of seizure in old age, although subsequent generalization often occurs (10).

Tallis *et al.* findings are in keeping with our and other epidemiological studies and show an age associated increase in prevalence of cerebrovascular disease (11) as we showed above. We could not find any clear etiology in 24 patients (24.7%). Since our evaluation was limited, we classified these patients under “unknown cause”, but some authors named them as “idiopathic epilepsy”. It shows that primary seizures may begin in late adult years and are not limited to adolescent or young people. However, close follow up of these seemingly idiopathic cases is essential.

According to our findings, epilepsy with onset after 50 years of age is more often symptomatic than epilepsy in younger patients, we found cerebral vascular disease and tumors in about 75% of our cases. Since seizures are the first sign of a CNS disease in half of the patients with brain tumor, careful investigation is necessary to reach a correct diagnosis (7).

We also recommend better control of risk factors of cerebrovascular diseases in our country, because it is the most effective way to prevent epilepsy in aged patients. It is especially true for hemorrhagic strokes because, unfortunately, control of hypertension in our community is not suitable and most patients are diagnosed very late in the course of hypertension. Control of other risk factors such as diabetes mellitus and hyperlipidemia and smoking have the same importance and must be considered in general health programs.

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