

Original Article

Evaluation of clinical features of elderly epilepsy in China

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Abstract: Recent data indicate that the prevalence and incidence of epilepsy are high among the elderly, many of whom will have concomitant neurodegenerative, cerebrovascular, or neoplastic disease. The aim of this study is to evaluate the clinical characteristics of elderly patients with epilepsy in China. We retrospectively reviewed the clinical records of 104 outpatients over 50 years of age (average: 63.8 years). The results showed that in the total 104 outpatients, 53 men and 51 women were studied. Twenty-seven (26.0%) patients had idiopathic epilepsy syndromes, and 15 (14.4%) patients were considered cryptogenic. Sixty-two (59.6%) patients had remote symptomatic epilepsy. According to the known etiological factors, cerebrovascular disease (53.2%) is the most common underlying cause, followed by craniocerebral trauma (16.1%), primary or metastatic neoplastic disease (16.1%), and others (14.5%). The most common type of seizure in the group studied was partial seizures (51.9%), followed by generalized seizures (37.5%). Forty-three patients (41.3%) were used combination medication and 61 patients (58.7%) were used single medication. In conclusions, this study provides important data for clinical and research purposes in China. Further research is indicated to confirm the clinical findings of the elderly people with epilepsy by a larger epidemiological study.

Keywords: Epilepsy, etiology, type of seizure, elderly

Introduction

Recent data indicate that the prevalence and incidence of epilepsy are high among the elderly, many of whom will have concomitant neurodegenerative, cerebrovascular, or neoplastic disease. Among persons 65 years of age and older, the prevalence rate is approximately 1.5%, about twice the rate of younger adults [1]. In an epidemiological survey undertaken in Southwest France, the annual incidence rate per 100,000 persons 60 years or older was 127.2 for all seizures [2]. The most commonly reported etiological factors are stroke, tumors, head injuries, genetic inheritance, and CNS infections [3]. Cerebrovascular disease is the most common underlying cause, although as many as 25-40% of new epilepsy cases in the elderly have no obvious underlying etiology [4]. New-onset seizures in elderly patients are typically cryptogenic or symptomatic partial seizures that require long-term treatment. Antiepileptic drugs (AEDs) are the mainstay of treatment. However, there is no consensus on

the most appropriate way to diagnose or manage epilepsy in this population. Little well-founded information is available on which to base treatment decisions. So the aim of our clinical research was to analyze the clinical characteristics in the elderly with epilepsy in China.

Materials and methods

Study population

The study population included all current patients of the epilepsy clinic at the PLA General Hospital from 2006 to 2008.

Inclusion and exclusion criteria

Patients who had experienced two or more unprovoked seizures were included in the study. Patients with seizures in their medical history with inborn brain injury, or those who were taking anticonvulsant drugs prescribed because of seizures accompanied by loss of consciousness were excluded.

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Table 1. Clinical characteristics in different subgroups (104 patients)

Clinical characteristics	Total (n)	Subgroups		
		A	B	C
Number of patients	104	56	34	14
Type of seizure				
Partial seizures	54	32	17	5
Generalized seizure	39	17	14	8
Unclassified seizure	11	7	3	1
AEDs therapy				
Monotherapy	61	38	15	8
Polytherapy	43	18	19	6
Epilepsy syndromes				
Idiopathic	27	15	10	2
Symptomatic	62	34	19	9
Cryptogenic	15	7	5	3

Investigation procedures and diagnoses

All patients' information was obtained by review of medical records and interview with the patient and/or family member, including demographics, seizure type, etiology, auxiliary examination, antiepileptic treatment and course of epilepsy. All selected patients underwent routine EEG examination. In some selected cases, video-EEG, Active-EEG, and neuropsychological assessment were also completed to reach a precise diagnosis. All patients and investigation results were assessed by two epileptologists independently, and then a consensus diagnosis was reached according to criteria of the International League against Epilepsy.

Material analysis

The whole group was divided according to age into three standard subgroups: subgroup A (aged 50-60), subgroup B (aged 61-70), subgroup C (aged 71-80). The analysis of the medical documentation included the results of subjective and objective examination, medical history and previous pharmacological treatment that might have reflected the epileptogenesis.

Statistical analysis

All statistical analyzes were done with the help of SPSS 20.0 software. Data was expressed as medians or number of patients and analyzed with *t* test analysis in the different groups.

Results

Basic data

One hundred and four patients (51 females and 53 males; age range, 50-80 years; mean age, 63.8 years) were included in the study. There were 56 patients in subgroup A, 34 patients in subgroup B, 14 patients in subgroup C (**Table 1, Figure 1A**).

EEG examination

A routine EEG in 34 patients (32.7%) showed no abnormalities. In 52 (50.0%) patients, routine EEG showed frequent epileptiform discharges and slow wave activity. Bilateral or generalized discharges on the EEG occurred in 18 (17.3%) patients.

Seizure types and therapy approach

Seizure types and therapy are shown in **Table 1** and **Figure 1B-D**. The most common seizure type was partial in 54 (51.9%), including complex partial seizures (36/54, 66.7%) and simple partial seizures (18/54, 33.3%) (Data not shown). The second was generalized in 39 (37.5%), followed by unclassifiable in 11 (10.6%) patients. 61 (58.7%) patients received monotherapy, and 41.3% of patients received polytherapy.

Seizures type correlates with the subgroup of patients

For the partial seizures, we discovered a significant liner relationship between the subgroups and the cases of patients (**Figure 1B**). Furthermore, the similar liner relationship was also observed in the generalized seizure and unclassified seizure (**Figure 1C, 1D**).

Epilepsy syndromes and aetiology

As seen from **Table 1** and **Figure 2A**, 27 (26.0%) patients had idiopathic epilepsy syndromes, and 15 (14.4%) patients were considered cryptogenic. So we were unable to identify any possible cause of the seizures in 42 patients. Sixty-two (59.6%) patients had remote symptomatic epilepsy. Moreover, we also found that symptomatic epilepsy documented over 50% in all of the three subgroups (**Figure 2B**).

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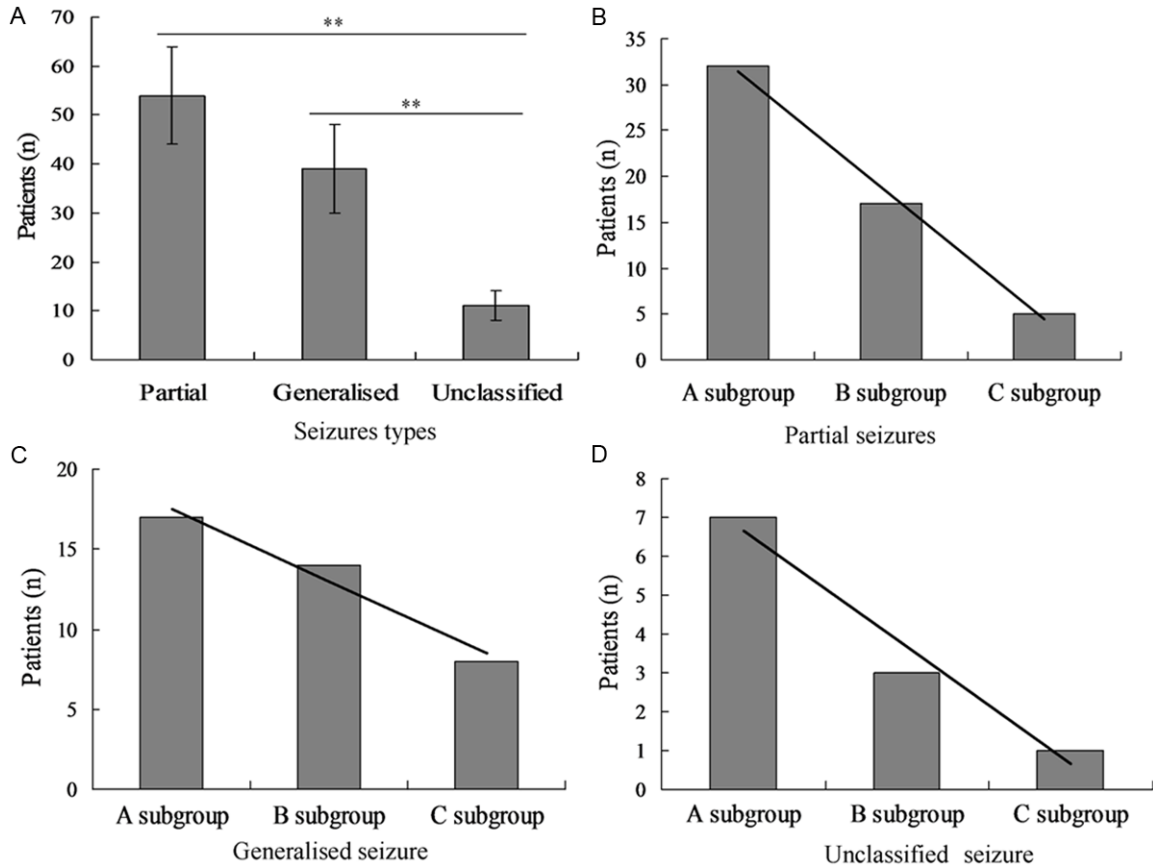


Figure 1. Types of seizures and the distribution in the subgroups. A. Types of the seizure of the patients. B. Distribution of the partial seizures in subgroups. C. Distribution of the generalized seizures in subgroups. D. Distribution of the unclassified seizures. **P < 0.01 represents the comparison of partial seizures or generalized seizures vs. unclassified seizures.

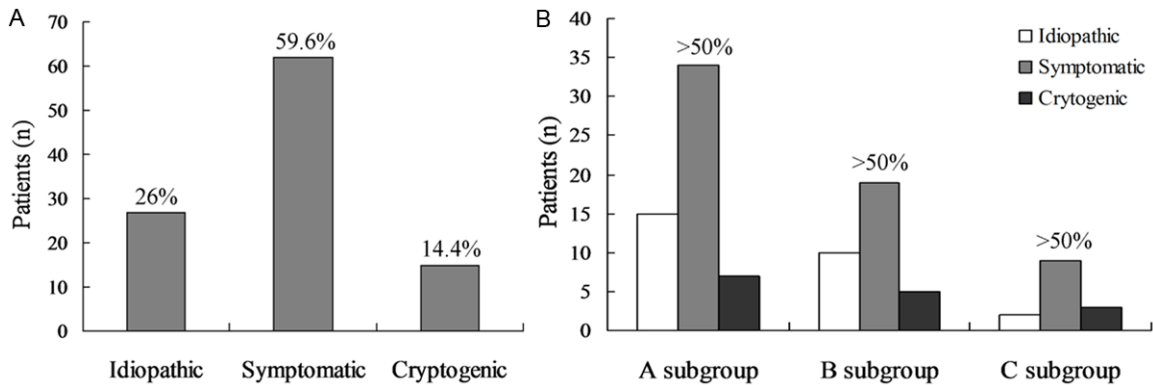


Figure 2. Classification and proportion of the epilepsy syndromes. A. Epilepsy syndromes distribution of patients. B. Epilepsy syndromes distribution in the subgroups. The proportion of the syndromes is marked upper the bands.

From **Table 2**, we found that cerebrovascular disease was the most common cause of epilepsy. 33/62 (53.2%) patients had cerebrovascular lesion (**Figure 3A**). We found this etiology in 19/33 (57.6%) patients in subgroup A, in

10/33 (30.3%) in subgroup B, and in 4/33 (12.1%) in subgroup C (**Figure 3B**). We found primary or metastatic neoplastic disease in 10 (16.1%) patients. This was present in 6/10 (60.0%) patients in subgroup A, in 3/10 (30.0%)

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Table 2. Causes of epileptic seizures in our study (62 patients)

Etiological factors	Total (n)	Subgroups		
		A	B	C
Cerebrovascular disease	33	19	10	4
Cranio-cerebral trauma	10	4	5	1
Neoplastic disease	10	6	3	1
Others disease	9	5	1	3

in subgroup B and in 1/10 (10.0%) patients in subgroups C. Moreover, we also found 10 (16.1%) subjects with post-traumatic epilepsy, and 9 (14.5%) with other diseases. Apart from encephalitis (4/62, 6.5%) in other diseases, we found that the presence of extensive leukoaraiosis is a cause of epilepsy in three patients. Only in two patients were alcohol addiction the etiological factor, but without focal cerebral lesion.

Discussion

Both the incidence and prevalence of epilepsy are high among the elderly and the elderly persons experience epilepsy at age-specific rates higher than any other age group [5, 6]. Lühdorf K et al estimated that the incidence of patients with epilepsy was 77 cases per year per 100,000 citizens over 60 years of age and generalized and partial seizures each accounted for about half of the seizures [7]. Several studies revealed that the annual incidence of epilepsy is 134 per 100,000 persons 60 years or older [8-10]. However, epidemiological surveys of epilepsy among elderly Chinese populations are unavailable.

In the present study, we found that the incidence of epilepsy in subgroup A (50-60 years old) was higher than other two subgroups. Moreover, our results showed that partial seizures are the most common type of seizure (51.9%) in patients over 50 years of age, followed by generalized (37.5%), and unclassified (10.6%). These results indicated that in the elderly Chinese population experience epilepsy, 50 to 60 years of age is a relatively more dangerous period, and partial seizures was the most common seizure type (obviously complex partial seizures). In some literature, Partial epileptic syndromes are more common than generalized epileptic syndromes in the elderly (45%-80% vs 9%-50%) [11, 12]. The potential mechanisms of epileptogenesis in the elderly are incompletely understood.

In an epidemiological survey undertaken in Southwest France, Cerebrovascular disease (53.9%) was the most frequently recognized origin, followed by brain tumor (32.9%) [2]. Major contributing factors to seizures and epilepsy in elderly are cerebrovascular and neurodegenerative diseases, brain tumors, CNS infections, toxic metabolic [13]. Cerebrovascular disease is the single most common pathological factor underlying epilepsy in elderly people [14]. Seizures are more common in hemorrhagic stroke and in stroke with cortical involvement. In our study, the causes of seizures were identified in 62 patients with cerebrovascular disease accounting for 53.2%, cranio-cerebral trauma 16.1%, neoplastic disease 16.1%, other diseases 14.5% including encephalitis, alcohol addiction, and leukoaraiosis. Leukoaraiosis may also trigger seizures. One study revealed that leukoaraiosis, as an epileptic risk factor, which induced a blood flow diminution and a decrease in oxygen consumption indifferent cerebral cortex areas [15]. In the study, the frequency of seizures decreased with advancing age, ranging from 57.6% in people under 60 years of age (subgroup A) to 42.4% over 61 years (subgroup B and C). This is not compatible with the results of Paradowski. Paradowski et al revealed that the frequency of seizures increased with advancing age, ranging from 41.9% in people under 65 years of age to 65.2% over 75 years [16]. In cranio-cerebral trauma and neoplastic disease, there is no positive correlation between the frequency of seizures and age. Neoplastic disease was most common in 60% patients in subgroups A (50-60 years of age). Moreover, Alzheimer's disease and other dementias are associated with a five fold to 10-fold increase in the risk of epilepsy, which usually develops in the advanced stage [17]. In our study, because Mini-Mental State Examination (MMSE) was not routinely performed in the seizure patients who were suspected to have cognitive disturbances, the data about dementia could not be acquired. In future work, a larger, population based, epidemiological study is indicated to confirm the findings of this study.

In the present study, the results revealed remote symptomatic epilepsy in 59.6% of patients, cryptogenic epilepsy in 14.4%, and idiopathic epilepsy in 26.0%. These proportions are comparable with Hong Kong data reported by Fong et al. [18]. Among patients with unknown causes of epilepsy, it is necessary to take a thorough examination to rule out the

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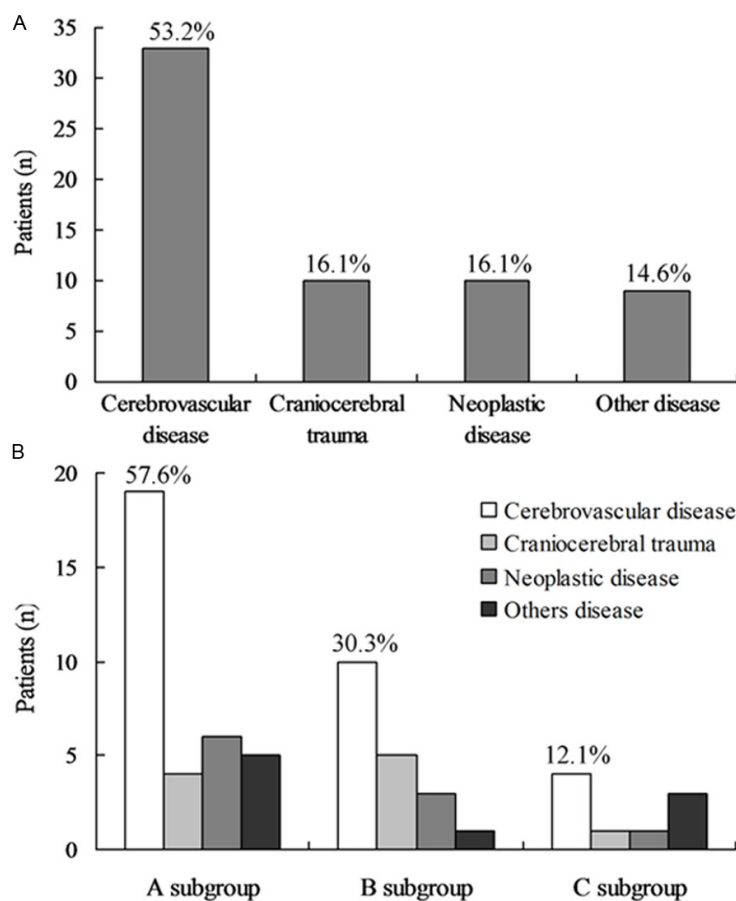


Figure 3. Causes of epileptic seizures in patients and subgroups. A. Causes of epileptic seizures in patients. B. Causes of epileptic seizures in the subgroups. The proportion of the syndromes is marked upper the bands.

possibility of any neoplastic disease or a follow-up CT or MRI examination of the head.

Disclosure of conflict of interest

None.

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