

New-Onset Seizures in Elderly Patients

Thesis

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List of Abbreviations

Abbrev.

AD	Alzheimer disease
AED	Antipileptic drugs
AIDs	Acquired immune deficiency syndrome
BiPEDs	Bilateral synchronous periodic epileptiform discharge
CBC	Complete blood count
CJD	Creutz feldt-jacob disease
CNS	Central nervous system
CSF	Cerebrospinal fluid
CT	Computerized tomography
DLB	dementia of lewy bodies
EEG	Electroencephalogram
FS	First seizure
GABA	Gamma amino-butyric acid
HCV	Hepatitis C virus
Hr MRI	High resolution magnetic resonance imaging
HSE	Herpes simplex encephalitis
HSV-1	Herpes simplex virus type 1
ICU	Intensive care unit
IDST	Intracranial dural sinus thrombosis
ILAE	International league against epilepsy
JE	Japanese encephalitis
KATP	Potassium adenosine triphosphate

List of Abbreviations

Abbrev.

MRIMagnetic resonance imaging

mRSModified rating scale

NICUNeurological intensive care unit

NKHSNon ketotic hyperglycemic seizure

OCSPOxford shire community stroke project

PLEDPeriodic lateralized epileptiform discharge

PTEPosttraumatic epilepsy

PTSPosttraumatic seizure

SEStatus epilepticus

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symptomatic seizures. Unprovoked seizures differ from acute symptomatic seizures in risk of seizure recurrence and mortality for several etiologies (*Beghi et al., 2010*).

Unprovoked seizures may be caused by a static injury (remote symptomatic seizures) or a progressing injury (progressive symptomatic seizures).

Epilepsy occurs when 2 or more epileptic seizures occur unprovoked by any immediately identifiable cause. The seizures must occur more than 24 hours apart (*Beghi and Hauser, 2008*).

Causes of New Onset Seizures in Elderly

A definitive etiology can be identified for about 70% of cases in elderly with seizures. Those cases without known causes are etiologically classified as idiopathic or cryptogenic (*Aleem and Nagaraja, 2005*).

Some researchers have recently proposed that central nervous system (CNS) microvascular disease is the cause of most of the cryptogenic cases in which the exact cause is unknown, because systemic cerebrovascular disease risk factors (hypertension, hypercholesterolemia, coronary artery disease, and peripheral vascular disease) have been associated with seizures in the absence of evidence of stroke on neuroimaging studies (*Pugh et al., 2009*).

INTRODUCTION

One of the main features of the Egyptian population over the last few decades is the gradual increase in the absolute and relative numbers of old people (*Gad Allah, 2004*).

According to preliminary results of Egyptian census in 2006 elderly will constitute 6.27% of population (*CAMPAS, 2006*).

The issue of problems of the elderly is under the spot light of many researches in developed countries, but it is still of little concern in the Arab world as in Egypt in comparison to these countries (i.e. in developed countries) mainly in the health problems (*Saad, 1997*).

According to many researches done in United States of America, acute seizure and epilepsy are two of the most common neurologic complaints in the elderly (*Waterhouse and Towne, 2005*).

The general perception is that seizures occur most often in infants but rarely in older adults. However, population-based studies indicate that seizure disorders increase in incidence and prevalence after the age of 60 years. Because people are living longer and becoming more likely to have concurrent medical illnesses requiring multiple medications, family physicians are

increasingly challenged to provide appropriate management of seizures and monitoring of antiepileptic drug therapy in their older patients (***Velez and Selwa, 2003***).

So, it is important to highlight on the difference between younger and elderly patient with seizure as in its incidence, prevalence, causes, clinical presentation, prognosis and treatment responsiveness (***Ramsay et al., 2006***).

The incidence of acute seizures in patients older than 60 years is approximately 100 per 100,000 population and increases with each decade of advancing age (***Waterhouse and Towne, 2005***).

Other several epidemiological studies over the last 10 to 15 years have revealed the prevalence of epilepsy is 1% for individuals over the age of 60 and increases with advancing age. In some groups of high risk individuals, such as nursing home residents, it exceeds 5% (***Ramsay et al., 2006***).

In many older patients, an underlying cause of seizure activity is clearly identifiable. Epidemiologic studies have defined acute symptomatic seizures as those that happen in the context of an acute insult to the central nervous system (CNS) or during an acute metabolic disturbance. These seizures are associated with subdural hematoma, stroke, and CNS infection.

They also can occur with systemic metabolic conditions such as uremia, hyperglycemia, hypoglycemia, hyponatremia, and alcohol withdrawal. Other possible underlying causes are brain tumors, degenerative brain diseases as Alzheimer disease, hypertensive encephalopathy and cerebral vasculitis (**Velez and Selwa, 2003**).

The first step in diagnosing the cause of an acute seizure is to obtain an accurate history of the paroxysmal event from the patient which may be difficult or impossible. Thus, it is critical to obtain a reliable firsthand observer's complete account of the events leading up to, during, and following the seizure (**Sirven and Ozuna, 2005**)

Neuroimaging is recommended as part of the initial evaluation of all older patients who present with a first seizure. In general, the imaging modality of choice for evaluating suspected seizures is MRI because of its sensitivity for finding subtle or small lesions. Emergent CT is required when any of the following are present: new focal neurologic deficits, persistently altered mental status, a recent history of trauma, persistent headache, anticoagulant use, immuno-compromised status, or fever.

Routine laboratory evaluation in an elderly person with suspected seizures should include a CBC; tests to measure

electrolytes, calcium, magnesium, phosphorus, BUN, creatinine, and glucose; liver function tests; and toxicology screening. Lumbar puncture is indicated when encephalitis, meningitis, or cancer is suspected (**Sirven and Ozuna, 2005**).

Older patients with acute seizures may have a variety of EEG changes, only some of which are attributable to underlying pathology. Interictal epileptiform activity occurs less frequently in older than in younger age groups as it is found in about one third of routine EEG.

Thus, elderly patients have a greater likelihood of non-diagnostic findings on a routine EEG. So, prolonged EEG recording, ambulatory

EEG, and inpatient video-EEG monitoring significantly increase the diagnostic yield (**Waterhouse and Towne, 2005**).

Treatment decisions require careful consideration in the context of age related physiologic changes, co-morbidities and the use of concomitant medications. Treatment of an acute seizure with a clear precipitating cause involves correcting the underlying etiology. While candidates for antiepileptic drug (AEDs) therapy include patient with recurrent seizures, onset of epilepsy presenting as status epilepticus or a clear structural predisposition for seizure (**Velez and Selwa, 2003**).

The prognosis for elderly epilepsy patients treated with antiepileptic is generally good. Both older and newer AEDs are efficacious but have respective advantages and disadvantages; no ideal AEDs yet exists (***Waterhouse and Towne, 2005***).

AIM OF THE WORK

To identify the commonest etiologies of new-onset seizures in elderly admitted in Ain Shams Hospitals.

SEIZURES IN ELDERLY

Overview

Seizures occur frequently in patients older than 60 years. Seizures are a symptom of an underlying disorder, which may be of varied etiologies (*Sirven, 2001*).

Magnitude of the Problem

Incidence:

Several studies reported that the highest incidence of new-onset epilepsy occurs in individuals aged 60 and older and it is anticipated that elderly people will constitute half of all new-onset epilepsy patients by 2020, although many consider epilepsy to be a condition of childhood (*Pugh et al., 2009*).

The incidence of acute seizures in patients older than 60 years is approximately 100 per 100,000 population and increases with each decade of advancing age (*Begley et al., 2000*).

New-onset epilepsy develops in an estimated 60,000 US adults over 65 each year, and 16,000 of them will continue to have seizures despite treatment (*Begley et al., 2000*).

In developed countries in Asia, incidence of epilepsy follows a bi-modal distribution with 1st peak in first few years

of life whilst a second and more pronounced peak is in those >65 years. Reported Incidence rates of epilepsy was >130/100,000/year in people >65 years, and >160/100,000/year in those >80 years (**Shih-Hui, 2004**).

Incidence of status epilepticus was reported to be 60 to 80/100,000/year after age 60 years, with mortality twice that of younger adults. About 35% of new seizures after age 75 were status epilepticus (**Shih-Hui, 2004**).

In the Rochester study in Minnesota, the overall incidence of epilepsy showed little change from 1935-1984. However, incidence in patients <10 years decreased by ~50%, while incidence in elderly patients correspondingly almost doubled (**Hauser et al, 1993**).

In developing countries, it has been estimated that incidence rate for epilepsy was higher (about 100-190/100,000/year) than those in developed countries (40-70/100,000/year) (**Sander and Shorvon, 1996**).

The age-specific incidence and the bimodal distribution reported in the developed countries have not been seen in developing countries. But it has been reported in some developing countries that there is a peak incidence of epilepsy occurred in early adulthood, with no increase in the elderly (**Mani et al., 1998**).