Neurodegenerative Diseases and Seizure Disorder

Part 3 of a 3-Part Continuing Education Series

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Counseling Points™

Neurodegenerative Diseases and Seizure Disorder

Continuing Education Information

Target Audience
This educational activity is designed to meet the needs of busy gerontological nurses and advanced practice nurses, as well as neuroscience nurses, who are on the front lines of managing elderly patients with seizures, in an effort to help them stay abreast of the latest research, treatment, and management options.

Learning Objectives
Upon completion of this educational activity, the participant should be able to:

• Describe the prevalence and impact of seizure disorder in elderly patients with neurodegenerative disorders.
• Detail why neurodegenerative disorders combined with the aging physiology increase the risk of seizure disorder in the elderly.
• Describe the altered presentation of seizure disorder in the elderly with neurodegenerative diseases.
• List the risks and benefits of antiepileptic drugs in elderly patients with seizure disorder and neurodegenerative diseases.

Continuing Education Credit
This continuing nursing education activity was approved by the National Conference of Gerontological Nurse Practitioners. Successful completion of this activity awards 1.2 contact hours.

The National Conference of Gerontological Nurse Practitioners is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center’s Commission on Accreditation.

This program expires December 31, 2009.

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Participants have an implied responsibility to use the newly acquired information to enhance patient outcomes and their own professional development. The information presented in this activity is not meant to serve as a guideline for patient management. Any medications, diagnostic procedures, or treatments discussed in this publication should not be used by clinicians or other healthcare professionals without first evaluating the patient's condition, considering possible contraindications or risks, reviewing any applicable manufacturer's product information, and comparing any therapeutic approach with the recommendations of other authorities.
Dear Colleague,

Neurodegenerative diseases are of increasing concern to geriatric nurses and advanced practice nurses as the American population ages. So, too, are seizures, which increase in prevalence as patients grow older.

In this issue of Counseling Points™ on seizures in the elderly, we explore the relationship between neurodegenerative diseases and seizure disorder. Neurodegenerative diseases such as dementia, stroke, and Parkinson’s disease enhance the risk of seizure disorder in the elderly, information that is crucial to effective geriatric nursing. Nurses and advanced practice nurses need to know how to recognize seizure disorder in older patients with neurodegenerative diseases, because they may display behavioral symptoms rather than involuntary motor signs and symptoms. Finally, these clinicians also need to know how seizure treatment will impact concurrent medication regimens for neurodegenerative diseases.

Counseling Points™ on seizures in the elderly is an official publication of the National Conference of Gerontological Nurse Practitioners (NCGNP) and the National Gerontological Nursing Association (NGNA). We would like to thank Ortho-McNeil Neurologics, Inc. for sponsoring this publication under an educational grant.

We encourage you to send us your comments about the content of this and the other two issues in this series on seizure disorder, and we welcome your suggestions for topics you would like to see covered in future issues. A space is provided for your input on the evaluation form on page 15. We also hope you’ll consider becoming involved with the NCGNP and NGNA, if you’re not already; please visit our websites at www.ncgnp.org and www.ngna.org for information on membership.

Sincerely,

Debra Bakerjian, PhD, MSN, RN, FNP
President, NCGNP

Judith E. Hertz, PhD, RN
President, NGNA
Neurodegenerative Diseases and Seizure Disorder

Introduction

…. John is a 77-year-old nursing home resident who is known for his easy-going demeanor. The nursing home staff is puzzled by his occasional episodes of intense anger. Sudden and unprovoked, this behavior is totally out of character for John.

…. Margaret is an 85-year-old woman with severe dementia who has frequent, sudden muscle contractions. Often, these brief muscle contractions only affect one of her arms, but at times her whole body is involved.

…. Eleanor is a 69-year-old woman with Parkinson’s disease residing in the community with her daughter, who is her primary caregiver. At times, she is noted to stare and is apparently unaware of her surroundings. At other times, she will repeatedly blink her eyes. During these periods, she shows no response when someone tries to get her attention. Eleanor’s daughter states she is confused after these episodes.

…. Jeanie is a 60-year-old woman with Down syndrome and dementia who recently moved into a long-term care facility. The nurse entered her room this evening to find Jeanie on the floor unconscious and experiencing rhythmic twitching of her arms and legs.

Despite the differing presentations, each of the individuals described in the vignettes above is having seizure activity. Whatever form it takes, seizure activity negatively impacts on the quality of life and well-being of the older adult. Thus, it is important for nurses working with older adults to have an understanding of the altered presentation of seizures in this population.

Older adults have the highest incidence of seizures of any age group, although obtaining an accurate diagnosis and initiating appropriate treatment is often delayed.1 Identifying seizures in this population can be particularly challenging due to an altered presentation: Behavior changes, increased confusion, and vague complaints such as dizziness associated with seizures in the elderly can easily be attributed to a variety of other conditions.2-4

Overview of Seizure Disorder

A seizure is a sudden alteration in normal brain activity that results in distinct changes in behavior and/or body function. Acute symptomatic (provoked) seizures occur when there has been an acute insult to the central nervous system (CNS). The risk of having an acute symptomatic seizure rises each decade after the age of 60 (Figure 1).1,5,6 Stroke is the cause of nearly half of such seizures and typically these seizures will occur within 24 hours of a stroke event (Figure 2).8 Neurodegenerative disorders are also implicated in provoked seizures. Ten to 22% of those with Alzheimer’s disease will experience at least one seizure, usually in the later stages of the disease.9 Other causes of acute symptomatic seizures in older adults include metabolic disturbances, drug/alcohol withdrawal, trauma, brain tumors, and infection.4 In approximately 50% of cases,

Figure 1. Incidence of acute symptomatic and unprovoked seizures in the elderly.1,6

Used with permission from Epilepsia.
The term epilepsy (seizure disorder) is used when seizures are recurrent and unprovoked. While onset of epilepsy can occur at any age, there is an increased risk of both provoked and unprovoked seizures associated with aging.\textsuperscript{5,6} In the United States, nearly a quarter of the 2.3 million persons with epilepsy are over the age of 65.\textsuperscript{7} New-onset epilepsy occurs in approximately 60,000 people over age 65 each year.\textsuperscript{7}

While older adults often have chronic health problems such as cerebrovascular disease that put them at increased risk of developing seizures, it is likely that the process of aging itself also increases the risk of seizure development.\textsuperscript{4} There are numerous changes in the aging brain, including the loss of neurons, alterations in brain chemistry, and histologic changes including lipofuscin and amyloid deposits, that may predispose patients to seizures.\textsuperscript{10} Amyloid deposition may play a role in the development of both Alzheimer’s disease and seizures. People with Down syndrome have a particularly high risk of developing Alzheimer’s disease: This form of dementia occurs in more than half of those over age 50 in this population, and up to 84% of those with the combined Down syndrome and Alzheimer’s disease presentation will have seizures.\textsuperscript{11} It appears that what makes those with Down syndrome highly susceptible to both Alzheimer’s disease and seizures is that they have an extra copy of chromosome 21, which is involved in the production of amyloid precursor protein.\textsuperscript{12}

The most common type of seizure in older adults is the complex partial seizure; however, the presentation of these seizures can be very different from that seen in the general population.\textsuperscript{3} In the general population, these seizures usually originate in the temporal lobe and are accompanied by a distinct aura. In older persons, in contrast, complex partial seizures generally originate in the frontal lobe of the brain, which is involved in personality, intellect, speech, and movement. Older adults often have a vague complaint such as dizziness rather an aura. Another difference in seizure presentation in this population is that automatisms (involuntary automatic behaviors such as lip smacking or picking at clothing) do not occur as frequently as in younger persons. Post-ictal confusion, which is often present, also takes longer to resolve in older versus younger adults.\textsuperscript{3}

In most cases, seizures are brief and self-limiting. Prolonged seizure activity is indicative of status epilepticus, a life-threatening event. Status epilepticus is defined as a single seizure lasting more than 5 minutes or a series of seizures occurring without regaining consciousness. Status epilepticus is described as convulsive or non-convulsive activity depending upon the presentation. In convulsive status epilepticus, tonic-clonic seizure activity is seen, while in non-convulsive status epilepticus, behavior and cognition are affected. Non-convulsive status epilepticus is more difficult to recognize for this reason. Older adults are at greater risk of developing status epilepticus and face a greater mortality rate than the general population; this increased risk and poor outcome rises significantly in those over age 80.\textsuperscript{13} Like other seizure activity in older adults, stroke is often the precipitating factor for status epilepticus. Other causes include low anti-epileptic drug (AED) levels, hypoxia or anoxia, metabolic distur-
bances, brain tumors, infection, drug/alcohol withdrawal, and trauma. The immediate concern in status epilepticus is to stop the seizure activity and maintain cardiopulmonary functioning.

**Stroke and Seizures**
Cerebrovascular disease, which includes cerebrovascular accident (CVA), hypertension, and vasculitis, is a large contributor to disability and death. Annually, about 700,000 people experience a new or recurrent stroke. Many authorities consider seizure secondary to stroke as a major cause of epilepsy in the elderly population.

According to Benbir et al, hemorrhagic and venous infarctions are more commonly encountered in post-stroke seizure patients than atherosclerotic or cardioembolic strokes. These authors suggest that “strokes represent the most common etiology of epilepsy in patients over the age of 60 years, with an incidence of 2-4% occurring in different studies.” Seizures can occur early (within 7 days) or late (beyond 7 days) after a stroke, and can be focal or generalized, but are usually brief and associated with loss of consciousness when they occur in the presence of hemorrhage.

**Status Epilepticus and Stroke**
When remote symptomatic CVAs are combined with acute stroke cases, stroke represents about 40% of elderly patients with status epilepticus. Hence, stroke, acute or remote, represents a major cause of status epilepticus in the elderly. In a study of 342 patients with status epilepticus who had their first seizure after age 60, it was found that cerebrovascular disease was the primary cause followed by head trauma. Hauser described a retrospective population-based study in which calculations revealed that almost 0.4% of people who survive to age 75 will have had a previous episode of status epilepticus.

Etiology is a strong determinant of status epilepticus mortality in the elderly. It is likely that the increased risk of the elderly to develop CVA, systemic metabolic disease, and progressive symptomatic conditions (tumor, dementia) makes them more susceptible to developing status epilepticus. The fact that stroke and status epilepticus both have high mortality rates raises the question of whether that high death rate is attributable to the severity of the underlying CVA or to the effect of status epilepticus itself.

**Dementia, Parkinson’s Disease, and Seizures**
The term “neurodegenerative diseases” refers to a large, clinically and pathologically heterogeneous group that comprises all of the neurologic disorders leading to dysfunction and eventual death of subsets of neurons in highly specific functional anatomic systems of the body. The most common neurodegenerative diseases of the brain are Alzheimer’s disease (AD) and Parkinson’s disease, but also include Lewy body dementia, Huntington disease, and amyotrophic lateral sclerosis (ALS).

According to Ramsay, et al, the second most common cause of seizures in the elderly after cerebrovascular disease is neurodegenerative diseases.

**Dementia**
Degenerative dementias, such as Alzheimer’s disease, are associated with an increased incidence of seizures. The prevalence of seizures in patients with dementia ranges from 10%-20%. McAreathey and colleagues determined in a survey of dementia inpatients that those with seizure were younger and, according to one measure of mental status, significantly more cognitively impaired than control group patients with dementia only.

Thomas indicates that Alzheimer’s-type dementia and amyloid angiopathy are major causes of seizure, while Romanelli et al identify Alzheimer’s disease as a risk factor for new-onset generalized tonic-clonic seizures in older adults.
Sirven and Ozuna describe elderly persons as having seizure presentation characterized by dementia-related symptoms such as confusion, memory loss or delirium, and episodes of staring or disorientation. In addition, elderly persons can have unwitnessed seizures when they live alone or have limited social interactions.

In a case study described by Ramsay et al, a prime example of how cognitive assessment may aid in proper diagnosis and treatment of seizures is described as follows: A 72-year-old woman living alone was admitted with a diagnosis of dementia due to episodes of being “fuzzy” without a significant past medical history. On close examination, her electroencephalogram (EEG) revealed a dynamic change from a build-up of polymorphic delta activity followed by an abrupt change to a normal recording. The EEG recording appeared to depict epilepsy, although it did not have the morphology of epilepsy. Other than the atrophy seen on the CT scan, the clinical evaluation was unremarkable. Only after a video evaluation of the patient was viewed did what appear to initially be dementia later become evident as seizures.

According to Bergey, the impact of epilepsy on the physical health status of older adults is substantial and compounded by co-morbidities found in this population. Given the limited information available on the incidence of seizures and that no reports exist of seizure predictors in Alzheimer’s patients, Amatniek et al conducted a study to determine cumulative incidence and predictors of new-onset seizures in subjects with mild Alzheimer’s disease in a cohort followed prospectively. The study replicated the observation of earlier studies that an increased risk for unprovoked seizures exists in individuals with Alzheimer’s disease compared with others of the same age. This finding supports the theory that seizures can be a part of the natural history of Alzheimer’s disease.

**Seizure Semiology in the Elderly**

Kellinghaus et al observe that the degenerative processes of the aging brain do not influence the symptoms of seizures in the same way as the myelinating and maturation processes do in the first years of life. There are no major differences in the frequency of seizure types between the elderly and a younger control group matched according to location of the epileptogenic focus. Seizures with auras, automotor seizures with typical orofacial automatisms, and all seizure types with complex, semi-purposeful movements occur equally in both groups.

The notion that a different seizure semiology exists in the elderly is based primarily on the findings of a few hospital-based studies and one population-based study. These studies used the current classification of the International League Against Epilepsy (ILAE) of 1981 and distinguished only between simple partial, complex partial, and generalized seizures. The specific signs of seizure in the elderly reported in these studies may have been due to the use of a less-adequate seizure classification, the lack of an adequate control group eliminating location-inherent differences in semiology, and, especially in the case-population study, a different recruitment setting.

Kellinghaus et al also note that simple motor seizures like focal clonic seizures, versive seizures, and bilateral asymmetric tonic seizures are seen less frequently in elderly patients, a difference that might be attributed to the higher number of patients with generalized cerebral atrophy and white matter lesions. Therefore, one could speculate that the aging brain is less able to prevent the spread of focal seizure activity.

**Seizures and Epilepsy in the Older Adult: When to Initiate Seizure Treatment**

The decision to initiate treatment with medication for a seizure should be based on evidence of recurrent seizures, onset of epilepsy as status epilepticus, or the presence of a clear structural predisposition for seizures.
In particular, medical interventions probably should be initiated if the individual has seizures that impact quality of life.

**Treatment Options**

Pharmacologic interventions are the primary management of seizure disorder and treatment choices are generally based on what is known about the seizure (e.g., simple versus complex partial seizures, tonic clonic, or myoclonic), the known co-morbidities of the individual, and drug side effects.\(^{10,22}\) Consistent with multiple clinical guidelines, it is emphasized that all AEDs are equally efficacious for seizure control.\(^ {41,42}\) The newer AEDs (Table 1), however, are known to have fewer adverse effects than older agents such as phenytoin and carbamazepine.\(^ {41}\) In general, for older, medically stable patients with idiopathic, generalized seizures, lamotrigine and valproic acid are recommended as first-line treatments.\(^ {10}\) Phenytoin and carbamazepine are also often used in this setting due to their lower costs and previously established effectiveness.\(^ {10}\) The specific risks and challenges of use of these drugs in older adults are related to known hepatic changes and altered drug metabolism that occurs with age, and an increased likelihood of drug-drug interactions. It is also challenging to utilize currently advised dosages and drug serum levels, as these values were developed in and for younger individuals. Drug choices and potential side effects are shown in **Table 2**.

Decisions on drug use must be made based on individual needs and side-effect profiles. With regard to drug dosing, the guideline is to start low and monitor drug response in terms of prevention of seizure. Extended-release formulations may be helpful with regard to drug adherence. Expense can further influence treatment decisions, with older AEDs generally being less costly than newer AEDs.\(^ {43}\) It is not clear, however, what the potential costs of drug-drug interactions and other negative outcomes may be that can occur from use of the older treatment options (e.g., falls, fractures, confusion, sedation).

Certain drugs may offer a particular advantage in select patient populations. For example, topiramate may be helpful in obese patients as it can result in weight loss; for the same reason, it should be avoided in older adults with anorexia. Drugs with a more favorable cognitive profile in terms of side effects include gabapentin, tiagabine, lamotrigine, oxcarbazepine, and levetiracetam.\(^ {43}\)

**Special Challenges Associated with Medication Management in Older Adults**

Age-related physiologic changes in protein binding, albumin levels, hepatic metabolism, renal clearance, and absorption may influence AED metabolism and utilization.\(^ {44}\) Specifically, decreasing renal and hepatic function with age decreases the body’s ability to eliminate medication. There is also a decrease in oxidative metabolism via the cytochrome P-450 enzyme system, which further influences metabolism. In addition, there is a decreased ratio of muscle to body fat influencing drug binding. Therefore, a standard medication dose may result in higher drug serum concentrations in an older individual. In light of the reduced protein binding of drugs that occurs with age, drugs that are highly protein-bound such as phenytoin and carbamazepine may have normal or low plasma levels but high levels of free drug in the plasma, ultimately resulting in toxicity.

Generally, based on their pharmacokinetics, the

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**Table 1. Older and Newer AEDs**

<table>
<thead>
<tr>
<th>Older AEDs (Available Prior to 1993)</th>
<th>Year Introduced</th>
<th>Newer AEDs (Available After 1993)</th>
<th>Year Introduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenobarbital</td>
<td>1912</td>
<td>Felbamate</td>
<td>1993</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>1938</td>
<td>Gabapentin</td>
<td>1993</td>
</tr>
<tr>
<td>Ethosuximide</td>
<td>1960</td>
<td>Lamotrigine</td>
<td>1994</td>
</tr>
<tr>
<td>Diazepam</td>
<td>1968</td>
<td>Topiramate</td>
<td>1996</td>
</tr>
<tr>
<td>Carbamazepine</td>
<td>1974</td>
<td>Tiagabine</td>
<td>1997</td>
</tr>
<tr>
<td>Valproic acid</td>
<td>1978</td>
<td>Levetiracetam</td>
<td>1999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxcarbazepine</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zonisamide</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pregabalin</td>
<td>2005</td>
</tr>
</tbody>
</table>

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### Table 2. Medications for Seizure Management*

<table>
<thead>
<tr>
<th>Drug</th>
<th>Indication</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Adverse Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbamazepine (Tegretol®)</td>
<td>Partial seizures</td>
<td>Minimal sedation and cognitive adverse effects</td>
<td>Ataxia; diplopia; multiple drug interactions</td>
<td>Tremor; hyponatremia; lower WBC; osteoporosis; rash; cognitive changes; drug-drug interactions</td>
</tr>
<tr>
<td>Felbamate (Felbatol®)</td>
<td>Partial seizures—used only in refractory disease</td>
<td>None</td>
<td>Risk of serious adverse events</td>
<td>Aplastic anemia; weight loss; liver failure; gastrointestinal upset; sleep changes; headache</td>
</tr>
<tr>
<td>Gabapentin (Neurontin®)</td>
<td>Partial seizures</td>
<td>No hepatic metabolism; drug interaction only with antacids</td>
<td>Dosage modification needed in patients with renal disease; TID dosing required</td>
<td>Tiredness</td>
</tr>
<tr>
<td>Lamotrigine (Lamictal®)</td>
<td>Partial seizures</td>
<td>Interaction with AEDs only</td>
<td>Dosage modification needed in patients with liver disease</td>
<td>Prolonged half life; rash</td>
</tr>
<tr>
<td>Levetiracetam (Keppra®)</td>
<td>Partial seizures; myoclonic seizures; tonic-clonic seizures</td>
<td>Effective in the treatment of multiple types of seizures</td>
<td>Possible impact on behavior</td>
<td>Unusual thoughts or behaviors; fever; chills; body aches; flu symptoms; depression</td>
</tr>
<tr>
<td>Oxcarbazepine (Trileptal®)</td>
<td>Partial seizures</td>
<td>Low side-effect profile</td>
<td>Photosensitivity; dose should be adjusted when the glomerular filtration rate is &lt;30</td>
<td>Hyponatremia; fatigue; altered cognition</td>
</tr>
<tr>
<td>Phenytoin (Dilantin®)</td>
<td>Partial seizures</td>
<td>Low cost</td>
<td>Many drug and food/nutrient interactions</td>
<td>Peripheral neuropathy; gingival hypertrophy; frozen shoulder; osteoporosis; rash; cognitive changes; drug-drug interactions</td>
</tr>
<tr>
<td>Pregabalin (Lyrica®)</td>
<td>Partial seizures; generalized seizures</td>
<td></td>
<td></td>
<td>Reduced platelet counts; increased blood creatinine kinase levels with associated muscle pain; sedation; dizziness; edema; weight gain; impaired cognition</td>
</tr>
<tr>
<td>Tiagabine (Gabitril®)</td>
<td>Partial seizures</td>
<td>None</td>
<td>Dosage modification needed in patients with liver disease</td>
<td>Slowed thinking; tiredness</td>
</tr>
<tr>
<td>Topiramate (Topamax®)</td>
<td>Partial seizures; generalized seizures</td>
<td>Interaction with AEDs only; weight loss</td>
<td>Weight loss; dosage modification required if creatinine clearance is &lt;60 mL per minute</td>
<td>Weight loss; renal stones; slowed thinking</td>
</tr>
<tr>
<td>Valproic acid (Depakene®)</td>
<td>Generalized seizures; absence seizures</td>
<td>Broad-spectrum efficacy</td>
<td>Extensive protein binding; multiple drug interactions</td>
<td>Tremor; effect on platelet function; drug-drug interactions</td>
</tr>
</tbody>
</table>

*Optimal dosage is based on prevention of seizure, not on reaching therapeutic drug levels.

AEDs=anti-epileptic drugs; TID=three times a day; WBC=white blood count.
older AEDs tend to be more difficult to manage than the newer AEDs. The older AEDs are mostly metabolized by the P-450 enzyme system, which can impact other drugs being used by the individual. Conversely, the newer AEDs are metabolized via the glucuronidation system with less risk of drug-drug interactions. For example, gabapentin, levetiracetam, and pregabalin are almost 100% cleared by the renal pathway and therefore have a low risk for drug-drug interactions.

Although a therapeutic range has been established for the older medications, treatment should be driven by cessation of seizures without side effects from medications, rather than based on a recommended therapeutic range. Moreover, older adults can have a total phenytoin serum concentration that is below the therapeutic range, yet have unbound concentrations that are within the therapeutic range.

Treatment Complications Associated with Co-morbidities

Older adults commonly experience multiple co-morbidities that not only contribute to the incidence of seizures but likewise impact treatment. Co-morbidities can impact adherence to medications due to cognitive impairment, degenerative joint disease and functional impairment, or vision changes—all of which can make it difficult for patients to remember how to manage their medications. Likewise, conditions associated with dysphagia, diplopia, and absorptive disorders can influence medication management.

Treatment Consequences: Adverse Effects of AEDs

AEDs can be associated with hypersensitivity, dose-related adverse events, or adverse events related to chronic use. In particular, older adults are more sensitive to dose-related events such as ataxia, which can occur at doses lower than those seen in younger individuals. The major problem with adverse events in older adults is that they can have a significant impact on function. Associated ataxia, peripheral neuropathy, tremor, hyponatremia, and/or soft-tissue changes can influence the individual’s ability to ambulate safely or engage in activities of daily living. Table 2 provides some of the most common adverse events.

Dosing and Administration Considerations

If the first AED prescribed is not well tolerated at low doses or does not stop seizures, an alternative agent can be tried. If the first drug initiated is well tolerated but doesn’t control the seizures, then a second drug can be added. Generally administered via the oral route, the absorption of carbamazepine is decreased when given during nasogastric feeding. To improve absorption, carbamazepine suspension should be mixed with an equal volume of diluant prior to being inserted into the nasogastric feeding tube.

Discontinuation of Pharmacologic Management

Consideration can be given to stopping medication if the patient is free of seizures for 2 to 5 years. When a decision to withdraw an AED is made, the drug should be tapered no faster than every 4 to 6 weeks in decrements of 20%. If a subsequent seizure occurs, immediate treatment of seizures for institutionalized older adults can be started with diazepam administered as a buccal squirt or rectal suppository.

The Role of the Nurse and Advanced Practice Nurse

The main concern of the nurse and advanced practice nurse during a seizure is to protect the person experiencing the episode from harm and to maintain a patent airway. In the event that this is a first seizure or if seizure activity is prolonged (status epilepticus), immediate emergency medical care is needed. Table 3 describes nursing interventions during seizure activity.

Seizure Documentation

Seizure documentation is a valuable tool both in making the diagnosis of seizure disorder and in evaluating the efficacy of treatment. Observation and documentation should include the following:

• What preceded the seizure
• Duration of the seizure

Table 2

Table 3
• Description of motor movement or rigidity type, where the seizure started, its progression, and parts of the body involved
• Position of eyes, size of pupils, staring, unresponsiveness
• Position of head
• Automatisms (twitching, jerking movements, or other atypical movements)
• Vocalizations (humming, talking, etc.)
• Confused or combative or other behavior changes
• Stiffness of extremities
• Incontinence of bowel or bladder or emesis
• Loss of consciousness—when and for how long
• Falling to the ground
• Injury during the seizure
• Behavior after the seizure—confusion, weakness, paralysis, sleep, or inability to speak.
• Medical interventions (medication, oxygen, vagus nerve stimulation) during the episode.  

Psychosocial Implications

The onset of a seizure disorder in the older adult has a number of psychosocial implications. Epilepsy, unfortunately, remains a stigmatized illness. Older persons may remember a time when there were many misconceptions and limited treatment options available. Educating older adults with seizure disorder and their families is important. Support groups and resources such as The Epilepsy Foundation (www.efa.org) will prove helpful.

A seizure disorder diagnosis is a life-altering event for an older adult and can compromise his or her quality of life. Seizure-related falls can result in injuries such as fractures that, in turn, can limit mobility and self-care activities. The older adult or family members may question the safety of the patient continuing to live on his or her own. Falls and fall-related injuries, seizure-related or not, often lead to nursing home placement in the older adult population. In addition, independence may be limited when driving privileges are revoked until it has been established that treatment is controlling seizure activity.

Older adults with newly diagnosed seizure disorder may curtail previously enjoyed activities. Some activities such as swimming may be unsafe if seizures are poorly controlled. In addition, patients may withdraw from socialization due to fear of embarrassment.

There appears to be a correlation between major depression and epilepsy. Those who develop epilepsy in later life tend to report greater anxiety and depression, and to rate their overall quality of life as lower than those who have been living with epilepsy for some time. Studies have found that there is a six times greater incidence for developing epilepsy in those with major depression. Some question the validity of these retrospective studies. The medications that are commonly used in treating people with major depression in years past included benzodiazepines, which have themselves been linked to seizure development. It appears that psychiatric co-morbidities, including depression, worsen with seizures.

Table 3. Nursing Interventions During Seizure Activity

- Do not restrain someone during a seizure.
- Protect the person from injury by clearing the immediate area of any hazards.
- Protect the head as much as possible—e.g., place padded siderails on the bed and outfit the patient with protective head gear if he or she is known to have frequent seizures, especially generalized ones.
- Do NOT place anything in the person’s mouth.
- If possible, turn the person’s head to the side to prevent aspiration of pooling respiratory secretions. Have suction equipment readily available in case it becomes necessary to suction the person.
- Monitor for color changes and administer oxygen if there is a color change.
- Observe for respiratory depression, which can occur during seizures.
- Remain with the person until consciousness is fully regained. It is not unusual for someone who has had a seizure to sleep afterwards. Place the person lying on his or her side (recovery position) if possible.
- Document seizure activity.
Summary

Seizure is an important differential diagnosis to consider in the care of older adults. Decisions to treat or not to treat the older individual, however, need to be made carefully based on the impact of the seizure on the quality of life of the individual balanced against the side effects of drug management. Using this approach to facilitate the evaluation and treatment of older adults for seizure will help nurses and advanced practice nurses optimally manage this potentially devastating clinical problem.

References


Older adults have the highest incidence of seizures of any age group, although obtaining an accurate diagnosis and initiating appropriate treatment is often delayed due to an altered presentation of the disorder.

The risk of having an acute symptomatic seizure rises each decade after the age of 60.

While older adults often have chronic health problems such as cerebrovascular disease that put them at increased risk of developing seizures, it is likely that the process of aging itself also increases the risk of seizure development.

The most common type of seizure in older adults is the complex partial seizure. The presentation of these seizures can be very different from that seen in the general population.

Stroke represents a common cause of seizures and status epilepticus in older adults.

The second most common cause of seizures in the elderly after cerebrovascular disease is neurodegenerative diseases, such as dementia and Parkinson’s disease.

The decision to initiate treatment with medication for a seizure should be based on evidence of recurring seizures, onset of epilepsy as status epilepticus, or the presence of a clear structural predisposition for seizures.

All antiepileptic drugs are equally efficacious for seizure control, but the newer agents have fewer adverse effects than the older agents.

Decisions on drug use must be made based on individual needs and side-effect profiles.

Treatment should be driven by cessation of seizures without side effects from medications, rather than based on a recommended therapeutic range.

Consideration can be given to stopping a medication if the patient is seizure-free for 2 to 5 years.

The main concern of the nurse and advanced practice nurse during a seizure is to protect the person experiencing the episode from harm and to maintain a patent airway.

Seizure documentation is a valuable tool both in making a diagnosis of seizure disorder and in evaluating the efficacy of treatment.

There appears to be a correlation between major depression and epilepsy.
1. What percentage of patients with Alzheimer’s disease will experience at least one seizure, usually in the later stages of the disease?
   A) 2%-4%
   B) 5%-8%
   C) 10%-22%
   D) 25%-30%

2. Which of the following changes in the brain predisposes older adults to seizures?
   A) loss of neurons
   B) changes in brain chemistry
   C) histologic changes including lipofuscin and amyloid deposits
   D) all of the above

3. Older adults with combined Down syndrome and Alzheimer’s disease are at greater risk of developing seizures than other elderly adults.
   A) True
   B) False

4. According to Benbir et al, which types of strokes are more commonly encountered in post-stroke seizure patients?
   A) Hemorrhagic infarctions
   B) Venous infarctions
   C) Atherosclerotic infarctions
   D) Both A and B

5. According to a retrospective study conducted by Hauser, what percentage of people who survive to age 75 will have had a previous episode of status epilepticus?
   A) 0.4%
   B) 0.8%
   C) 1.3%
   D) 2.0%

6. The second most common cause of seizures in the elderly after cerebrovascular disease is:
   A) alcohol/drug withdrawal
   B) neurodegenerative diseases
   C) metabolic disturbances
   D) brain tumors

7. Which of the following anti-epileptic drugs (AEDs) may be helpful in obese patients as it can result in weight loss?
   A) Gabapentin
   B) Lamotrigine
   C) Oxcarbazepine
   D) Topiramate

8. Common adverse events associated with many AEDs include all BUT which of the following?
   A) Tremor
   B) Peripheral neuropathy
   C) Low blood glucose
   D) Drug-drug interactions

9. When a decision is made to withdraw an AED, the drug should be tapered no faster than every 4 to 6 weeks in decrements of:
   A) 5%
   B) 10%
   C) 20%
   D) 30%

10. Retrospective studies indicate that there is a ___ greater incidence for developing epilepsy in those with major depression.
    A) 3 times
    B) 4 times
    C) 5 times
    D) 6 times
Counseling Points™: Neurodegenerative Diseases and Seizure Disorder

To assist us in evaluating the effectiveness of this activity and to make recommendations for future educational offerings, please take a few minutes to complete this evaluation form. You must complete this evaluation form to receive acknowledgment for completing this activity.

Please answer the following questions by circling the appropriate rating:

1 = Strongly Disagree  2 = Disagree  3 = Neutral  4 = Agree  5 = Strongly Agree

**Extent to Which You Agree With the Following Statements:** (Please circle the appropriate number on the scale.)

<table>
<thead>
<tr>
<th>Statement</th>
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<tbody>
<tr>
<td>1. A diagnosis of dementia does not increase the likelihood of a seizure.</td>
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<td>2. Stroke is well-accepted as the most common etiology of epilepsy in the elderly.</td>
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<td>3. Seizures rarely occur beyond 7 days after a stroke.</td>
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<td>4. Parkinson’s disease can sometimes precipitate seizure disorders in the elderly.</td>
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**Extent to Which Program Activities Met the Identified Objectives:** (After completing this activity, I am now better able to:)

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<tr>
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<tr>
<td>5. Describe the prevalence and impact of seizure disorder in elderly patients with neurodegenerative disorders.</td>
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<td>6. Detail why neurodegenerative disorders combined with the aging physiology increase the risk of seizure disorder in the elderly.</td>
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<td>7. Describe the altered presentation of seizure disorder in the elderly with neurodegenerative diseases.</td>
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<td>8. List the risks and benefits of antiepileptic drugs in elderly patients with seizure disorder and neurodegenerative diseases.</td>
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**Overall Effectiveness of the Activity:** (The content presented:)

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<td>9. Was timely and will influence how I practice.</td>
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<td>10. Enhanced my current knowledge base.</td>
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<td>11. Addressed my most pressing questions.</td>
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<td>12. Provided new ideas or information I expect to use.</td>
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<td>13. Addressed competencies identified by my specialty.</td>
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<td>14. Avoided commercial bias or influence.</td>
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**Impact of the Activity**

Name one thing you intend to change in your practice as a result of completing this activity:

__________________________________________________________________________

Please list any topics you would like to see addressed in future educational activities:

__________________________________________________________________________

Additional comments about this activity:

__________________________________________________________________________

**Follow-up**

As part of our continuous quality improvement effort, we conduct postactivity follow-up surveys to assess the impact of our educational interventions on professional practice. Please indicate if you would be willing to participate in such a survey:

☐ Yes, I would be interested in participating in a follow-up survey.  ☐ No, I’m not interested in participating in a follow-up survey.

*If you wish to receive acknowledgment for completing this activity, please complete the posttest by selecting the best answer to each question, complete this evaluation verification of participation, and fax to (201) 612-8282.*

**Posttest Answer Key**

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**Request for Credit**

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