Epilepsy In the Elderly

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People over age 65 are the most rapidly increasing segment of the population. The incidence of epilepsy rises significantly with age, starting with 25.8/100,000 person-years for the ages of 60-74 and increasing to 101.1/100,000 for the ages of 75-89. The prevalence of epilepsy is 1.5% in the elderly, twice that of young adults. Also, the prevalence of epilepsy in nursing home residents is even higher than that in the general population. Review of elderly nursing home residents reveals that up to 10.5% are receiving anticonvulsants, along with an average of 5.6 other medications.

Etiology and Semiology

In the elderly, cerebrovascular disease accounts for 30-40% of cases. The incidence of seizures within the first year after stroke has been estimated to be 23 times that of the general population. Other causes include Alzheimer's disease, trauma, brain tumors and infection. About half of cases are cryptogenic, and it is presumed that vascular etiologies account for much of this group too.

Further complicating the diagnosis is the sometimes vague history. The events are often unwitnessed and may involve confusional symptoms. Elderly patients do not always have classical seizure semiologies or auras as in younger patients. Symptoms that may suggest alternative diagnoses can further confound; these may include tremor, headache and dizziness, among others. In a recent VA study, 27% of patients ultimately diagnosed with epilepsy were initially misdiagnosed as having syncope, altered mental status and confusion. Postictal periods tend to be more prolonged in this age group, at times lasting for several days.

Differential Diagnosis and Work-up

The differential diagnosis in this population is extensive and includes transient cerebrovascular symptoms (TIA), syncope (including convulsive syncope), confusional migraine, drug intoxication, infection, psychiatric disorders, transient global amnesia and dementia. Multiple metabolic etiologies can also be considered, including hypo- or hyperglycemia, thyroid dysfunction, hypercapnia, uremia and hyponatremia.

Electroencephalography can be pivotal, but one must be aware of potential false positive findings. Rhythmic runs of temporal theta activity may be seen in drowsiness as a normal or benign finding. Focal slowing may be present with underlying cerebrovascular insults. Wicket spikes and subclinical rhythmic electrographic discharges in adults (SREDA) are two other benign variant patterns that can be misinterpreted. Long-term video-EEG monitoring (LTM) may prove invaluable in evaluating recurrent spells. Brain imaging should be performed, preferably MRI. Other testing considerations include basic metabolic screens, sleep studies, Holter monitoring, echocardiogram, tilt-table and/or vestibular testing, where appropriate, to rule out competing diagnoses.

Several medications more common in the elderly can pose significant interactions with some AEDs. For example, highly protein bound AEDs (e.g. phenytoin and valproate) may interact with warfarin and other highly protein bound concomitant medications, leading to complex untoward interactions. Cytochrome P450-inducing AEDs (phenytoin, carbamazepine, phenobarbital) accelerate the clearance of some hepatically cleared drugs, including some chemotherapeutics.

Several AEDs are known to contribute to accelerated bone demineralization. The older generation of AEDs seems to be worse in this regard. The elderly are at a greater risk of osteoporosis and related fractures, so this may be relevant. Balance and cognitive concerns are also enriched in the elderly. Some AEDs appear to pose greater balance risks (e.g. phenytoin, carbamazepine) or cognitive risks (e.g. phenobarbital, topiramate). Hyponatremia, a problem occasionally provoked by carbamazepine and oxcarbazepine, is more frequent in the aged, particularly with concomitant diuretic use.

The elderly are likely to have more medical diagnoses and take more medications than a younger population and thus are far more susceptible to drug-drug interactions. AEDs that act as hepatic enzyme inducers or inhibitors will greatly augment this problem of drug-drug interaction burden in this age group. This is more often the case for the older AEDs. The newer (2nd generation) AEDs exhibit less hepatic affects and are more often
renal clearance, have lower protein binding, and hence have fewer drug interactions as a group. Additionally, the elderly may have more difficulty paying for AEDs, contributing to potentially poor compliance or restricted choice of agent.

**Antiepileptic Choices in the Elderly**

Little comparative efficacy data exist to help guide the use of AEDs in the elderly. Most clinical trials of AEDs have been conducted in younger and healthier adult populations. In the UK, Brodie et al. compared the efficacy and tolerability of lamotrigine vs. carbamazepine in elderly patients with new onset epilepsy. They found similar efficacy but better tolerability in the lamotrigine arm. A similar US study compared gabapentin vs. lamotrigine in the elderly and found better tolerability in the gabapentin and lamotrigine arms vs. carbamazepine with no significant efficacy distinctions. However, a later international study that compared lamotrigine and carbamazepine using a more flexible dosing schedule and slow release carbamazepine did not observe as marked a tolerability difference.

It is helpful when treating the elderly with epilepsy to keep the regimen as simple as possible. Medication choices should be tailored to seizure type, with most being partial onset rather than generalized in this population. Tolerability concerns should be considered carefully in AED selection and individualized accordingly. Doses should generally begin quite low and titration should be as slow as possible. Levels may be helpful. Cost may be a deciding factor for some.

Fortunately, the majority of elderly cases are very responsive to treatment. Refractory epilepsy may be infrequently encountered in this group. Non-pharmacologic treatment options may be limited. Surgical resection is not as commonly used in this age group. Vagal nerve stimulation may prove an option for some when AEDs prove inadequate and surgery is not a viable option.

**Summary**

The incidence of epilepsy is higher in the elderly than in younger adults. This community presents a challenging set of considerations in diagnosis and management. Numerous other processes may mimic seizures in the elderly. After careful diagnosis, AED choices should take into account metabolism, drug-drug in interactions, co-morbidities, and side effect profiles while striving to achieve seizure freedom.

**References**


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Discussion of off-label usage of any product: gabapentin and lamotrigine. Reference is made to studies performed on the use of these medications in elderly patients with epilepsy.

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