Keywords: Epilepsy/Seizures/Older people/Quality of life

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New-onset epilepsy is increasingly being reported in older people so the symptoms, which differ from those in young people, must be recognised to prevent misdiagnosis

Identifying and managing epilepsy in older adults

In this article...

- Why older people are more likely to develop epilepsy
- Why it can be difficult to diagnose epilepsy in this age group
- Old and new drug treatments and how they work

Author Jill Austin is junior OPD sister, Orpington Hospital South London Healthcare Trust; Aza Abdulla is consultant physician/geriatrician, Princess Royal University Hospitals South London Healthcare Trust.

Abstract Austin J, Abdulla A (2013) Identifying and managing epilepsy in older adults. *Nursing Times;* 109; 3, 20-23.
Although epilepsy is often considered to be a condition that affects children and young people, the incidence of new-onset epilepsy has significantly increased among older people since the 1980s. In addition, it is set to rise further, placing an increasing burden on healthcare resources. One reason for this increase is the growth in the population of older people and in age-related conditions such as stroke and dementia, which predispose to epilepsy. The condition can easily go unrecognised in older people, and its symptoms can be dismissed as part of the ageing process or mistaken for other conditions, such as dementia, transient ischaemic attack or heart disease. This article discusses the presentation, diagnosis and treatment of epilepsy in older people.

There are more than 11 million older people in the UK, 1% of whom will have epilepsy (Brodie and Kwan, 2005). One large-scale study of data from primary care practices showed a prevalence of 12 per 1,000 and incidence of 147 per 100,000 in patients aged over 75 years, compared with nine and 69 respectively in the general population (Wallace et al, 1998). Both prevalence and incidence increase with age and are expected to rise further as the proportion of older people in the population grows. If underdiagnosis is taken into account, the incidence of epilepsy in older people may be 2-3 times higher than that suggested, and possibly 6-10 times greater than among younger people (Chadwick and Smith, 2002).

Seizures and epilepsy

The brain is a highly complex structure composed of millions of neurons (nerve cells that pass messages to each other). All its functions, including thoughts, emotions, actions and sight depend on electrical signals being passed from one neuron to the next in an orderly fashion. When a seizure occurs, this order is disrupted; the abnormal area of the brain discharges inappropriately and causes a sudden burst of excess electrical activity, which passes through brain tissue, leading to a temporary breakdown in normal messaging between neurons and a cessation of function. If these seizures are recurrent, the patient is diagnosed as having epilepsy. Recurrent seizures underpin the diagnosis of epilepsy – a single seizure does not necessarily result in a diagnosis of epilepsy; there must be a history of recurrence.

There are many different types of seizures. If the electrical depolarisation (change in the electrical activity of the cell membrane) is limited to a local area of the brain, it is known as a partial seizure. If the electrical activity crosses the midline to the other side of the brain, the seizure is a generalised seizure and leads to loss of consciousness. Occasionally, seizure activity may start as local disruption, then extend to involve the whole brain; this is known as a partial seizure with secondary generalisation.

When epilepsy begins in later life it is most likely to present as simple partial

5 key points

1. New-onset epilepsy has significantly increased among older people
2. Seizures often present differently in older people
3. An underlying cause should be sought for epilepsy in all older patients
4. Epilepsy in older people generally responds well to treatment
5. If left untreated, epilepsy can significantly reduce quality of life

Seizures occur when a sudden excess of electrical activity passes through the brain

seizures (Johnston and Smith, 2007), with or without secondary generalisation. These seizures do not affect consciousness; patients remain alert and may experience involuntary limb movements, twitching, unusual feelings, tastes or sensations. In complex partial seizures, consciousness is affected and the person may have only limited or no memory of the event, as well as involuntary movements.

Some people with epilepsy report that certain triggers may bring on their seizures, such as drinking too much alcohol, febrile illness (such as urinary tract infection), skipping meals, poor sleep and stress or anxiety.

Causes of epilepsy in older people

A range of diseases are associated with new-onset epilepsy in older people. Stroke, dementia and tumours were identified as the most common causes in two landmark studies. Stroke is the most important risk factor for epilepsy and can account for around two-thirds of cases. Epilepsy is also seen in patients who have cerebrovascular disease (CVD) but no history of stroke.

Dementia is the second most common cause and is responsible for 10-20% of all cases. Among the different types of dementia, patients with Alzheimer's disease are up to 10 times more likely to develop epilepsy than those without; this increases as the dementia progresses (Brodie et al, 2009).

Between 10% and 20% of seizures are associated with tumours; those most commonly found to produce seizures in later life are gliomas, meningiomas and metastases. Older people have an increased risk of falls, and head injury and trauma account for up to 20% of cases of epilepsy in this age group. Brain concussion, skull fractures, loss of consciousness or amnesia for more than one day and an age of 65 years and over, have all been identified as risk factors for developing epilepsy following head injury (Brodie et al, 2009).

As a result of this, an underlying cause should be sought in all older patients presenting with epilepsy although, in some cases, this may never be determined (the so-called cryptogenic). However, research has shown that older people with CVD were 35% more likely to develop new-onset epilepsy than those without (Pugh et al, 2009). It may be, therefore, that cerebral microvascular disease is responsible for most unknown causes of epilepsy in older people, as risk factors for cerebrovascular disease such as diabetes, hypertension, heart disease, alcoholism, and chronic kidney disease, are more common in old age.

TABLE 1. DIFFERENCES IN SEIZURE PRESENTATION

	Older people	Younger people
Seizure incidence	High	Low
Location of focus	Parietal/frontal	Temporal
Generalised seizures	Low	High
Structural lesions	More	Fewer
Aura	Fewer	More
Automatism	More	Fewer
Post-ictal confusion	Very long	Brief

Source: Adapted from Collins et al (2006)

Clinical presentation

Seizures often present differently in older adults (Table 1), mainly due to age-related changes in the brain (LaRoche and Helmers, 2003). The presentation of epilepsy in these patients can therefore be subtle and is often missed. The clinical presentation of a tonic-clonic state, presenting as dramatic convulsions, only occurs in 25% of older people with epilepsy; more often the presentation is mild and unlike that seen in young people. Older patients may present with any of the following:

- "Strange" feelings;
- Subtle behavioural changes;
- Staring;
- Memory blanks;
- An unaccountable loss of time;
- Transient confusion.

Auras (symptoms preceding the seizure) are commonly seen in young patients but less so in older people. The recovery phase (post-ictal period) is significantly longer in older people, sometimes lasting up to two weeks rather than minutes or a few hours for younger people. There is also an increased incidence of Todd's paresis after seizures. This focal weakness is localised to the left or right side of the body and usually subsides completely after 48 hours; it may also affect speech, gaze or vision. Automatisms (repetitive behaviours) are also more frequent in older people than younger people. The seizure may have been witnessed by a partner or relative who may report a history of pallor, abnormal movements, tongue biting, urinary incontinence, headache, confusion or drowsiness.

The subtlety and vagueness of symptoms can make diagnosis difficult and lead to delay. Epilepsy among older adults is often mistaken for other conditions such as dementia, stroke, heart disease and transient amnesia, so goes unrecognised in people who already have these conditions, or is dismissed as part of the ageing process (Aldrich, 2006).

Diagnosis

A key barrier to diagnosing epilepsy in older adults is the failure of some physicians to recognise the symptoms of epilepsy in older patients. Furthermore, a high proportion of patients experience complex partial seizures with symptoms such as wandering, listlessness or confusion (not knowing who or where they are), which make diagnosis difficult. One study showed patients waited an average of 1.8 years to be diagnosed (Johnston and Smith, 2007).

Diagnosis is based on a careful history and clinical examination. The history should include a full list of medications, and a detailed past medical history, in particular cerebrovascular risk factors and a history of the event(s). Witness reports of twitching, involuntary movements, loss or disturbance of consciousness, confusion, behavioural changes or absence attacks can be invaluable and should be sought where possible. Epilepsy is a probable diagnosis if:

- Events occur with the patient in a variety of postures, rather than always in the upright position or on standing from supine position;
- Events always occur during sleep;
- Confusion or amnesia following an event lasts for more than an hour;
- The patient experiences myalgia (muscle pain), headache or bitten lateral tongue or cheek.

Finally, abrupt and transient confusion, especially when recurrent, should always prompt consideration of epilepsy (Tallis, 1995). Asking patients to keep a diary of the events, with dates, times and a description of what happened and how they felt before and after, can also be useful when making a diagnosis.

Diagnosis of epilepsy is clinical but investigations are helpful when diagnosis is uncertain, or when other conditions cannot be excluded. Investigations depend on the patient's presentation but may include:

- Electrocardiograph (ECG);
- Ambulatory ECG;

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TABLE 2. **SEIZURES AND SYNCOPE**

	Seizures	Syncope
Posture	Not position dependent	Usually in upright position
Onset	Gradual	Sudden
Injury	More common	Less common
Incontinence	Common	Rare
Recovery	Slow	Rapid
Post-confusion	Marked	Little

- Tilt-table and carotid sinus studies; and
- Routine blood tests.

These may be undertaken to rule out any underlying medical conditions that may be responsible for the symptoms. Lying and standing blood-pressure recordings and an evaluation of cognitive function through such tools as the mini-mental state examination and the abbreviated mental test should be part of the routine clinical assessment.

Magnetic resonance imaging is the imaging of choice, as it can indicate the underlying cause like small vessel disease, cerebral infarction, tumour or trauma.

The electroencephalogram (EEG) is of limited diagnostic value in older people and should not be used routinely to prove or disprove the diagnosis of epilepsy; EEG abnormalities in healthy older adults are common. False-positive results to investigations are also not uncommon, asymptomatic arrhythmias on ECG and positive responses to tilt-table testing and carotid sinus massage are often seen.

Differential diagnosis

Falls, faints and "funny turns" are all common complaints in older people and, in some patients, will be caused by epilepsy. The variation in presentation means these patients may be seen by a range of clinicians, including GPs, specialists in older people's care, neurologists, and cardiologists.

A range of conditions can mimic epileptic seizures. Misdiagnosis is common and possibly affects up to 30% of older adults with underlying epilepsy (Scheepers et al, 1998; Smith et al, 1999). The list of differential diagnoses can be grouped into the following:

- Neurological: transient ischaemic attack, transient global amnesia, migraine, narcolepsy, restless leg syndrome;
- Cardiovascular: vasovagal syncope, orthostatic hypotension, cardiac arrythmias, structural heart disease, carotid sinus syndrome;
- Infections;
- Endocrine/metabolic: renal failure, hypothyroidism, hypoglycaemia, hyperglycaemia, electrolyte disturbances (hyponatraemia, hypokalaemia, hypocalcaemia);
- Sleep disorders: obstructive sleep apnoea;
- Alcohol withdrawal;
- Drug-induced seizures: antihistamines, antidepressants, antipsychotics and hypoglycaemic drugs.

Syncope is more prevalent than epilepsy in older people and should always be considered, especially if there is a postural component, for example if symptoms occur on rising or standing, or if the patient is taking any medications known to cause postural hypotension (such as antidepressants, antihypertensives, antipsychotics or diuretics). Epilepsy may be misdiagnosed as syncope and vice versa (Josephson et al, 2007; Grubb, 2005; Zaidi et al, 2000). Table 2 shows a comparison between seizures and syncope.

Treatment

Drug treatment is the mainstay of therapy in epilepsy. However, prescribing antiepileptic drugs (AEDs) in older people is more complex than it is in younger people, who are often in better health and less likely to be taking other medications (Ramsay et al, 2004). Older adults often have comorbidities as well as functional and cognitive impairment. Additionally, age-related physiological changes can affect the pharmacokinetics and pharmacodynamics of AEDs, while polypharmacy is common in older people and some of their other drugs may make seizures more likely or AEDs less effective. It is therefore particularly important to treat newly diagnosed older patients with a single AED initially, as recommended by the National Institute for Health and Clinical Excellence (2012).

AEDs work by reducing the excessive electrical activity or excitability of the neurons in the brain. They are divided into first-line and second-line drugs; first-line AEDs are usually prescribed when treatment is started. If the prescribed first-line drug does not control the seizures or is not tolerated because of side-effects, a different first-line drug may be tried, or a second-line drug may be prescribed alongside the first. A "start low and go slow" approach should be used, with the aim of controlling seizures using the minimum and lowest dose of AEDs, while causing the fewest side-effects.

Epilepsy in older people generally responds well to treatment. Around 60-70% will achieve seizure control with a single AED, and up to 80% can be expected to remain seizure free with AED treatment (Brodie and Kwan, 2005). However, older people are more susceptible to the adverse effects of AEDs than their younger counterparts; the drugs need to be taken consistently (every day at the same time) to prevent seizures and this can be challenging for some older adults, who may be more likely to forget to take their medication. It is not clear whether treatment can be safely withdrawn after a seizure-free period, so most patients who are very old will remain on their AEDs for life.

The goal of management should be a normal lifestyle – ideally through complete control of seizures without (or with minimal) side-effects – so that the patient's functional capacity is restored. Among the most common side-effects of AEDs that affect people in later life are unsteadiness and sleepiness. Some AEDs can increase the risk of osteoporosis and osteomalacia (Lidgren and Walloe, 1977); it is not clear whether this extends to the newer AEDs and more long-term studies are needed.

Depression can be a side-effect of AEDs, particularly the older drugs such as phenytoin, phenobarbital and primidone. AEDs can also exacerbate memory problems, intensifying a decrease in cognitive function associated with the ageing process.

Recent reviews such as that by Johnston and Smith (2007) have indicated that the newer AEDs such as lamotrigine, levetiracetam and gabapentin are better tolerated and produce fewer side-effects than the long-established drugs such as carbamazepine, phenytoin and sodium valproate; the newer drugs are therefore recommended for the treatment of epilepsy in older adults.

Quality-of-life

Although few studies have investigated the lifestyle implications of epilepsy in older people, the data indicates that the

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Paul Jebb p33

adverse consequences are at least as important in this age group as for younger people (Baker et al, 2001). These harmful consequences, which may be immediate or take longer to manifest, include:

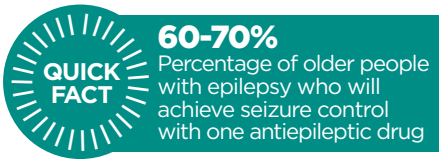
- Loss of independence;
- Loss of confidence;
- Social isolation;
- Embarrassment;
- Low self-esteem;
- Anxiety;
- Depression;
- Driving restrictions; and
- Difficulties with employment.

All these have all been suggested as important contributors to impaired quality of life (Baker et al, 2001). In later life the effect on occupation may be less important but the social and functional effects of a diagnosis of epilepsy are diverse.

Seizures resulting in falls, confusion or amnesia might erode confidence and contribute to social isolation. Patients can become frightened to leave the house alone or be embarrassed about an event happening in the presence of others. Many older people associate epilepsy with negative images of intellectual disability and poor seizure control, and may be reluctant to share the problem with friends or accept the diagnosis of epilepsy.

Driving restrictions might limit independence and provoke further isolation for those already living alone. There is also data suggesting older people with epilepsy have a decreased mental status and a higher prevalence of depression, anxiety and poor sleep compared with peers of a similar age who do not have epilepsy (Brodie et al, 2009). All these factors translate into a poorer quality of life. It has been suggested that the occurrence of seizures may represent a "significant watershed in an older person's life after which there is a sharp decline in functional independence" (Tallis, 1995).

Seizures that cause falls are more likely to cause injury in older people. Furthermore, the often prolonged post-ictal phase can contribute to falls and physical injury such as burns, fractures, strains, lacerations and bruising. Loss of confidence and independence, poor mobility, falls and impaired self-confidence can result in admission to residential care. The mortality rate in older patients with epilepsy is higher than the average mortality rate for older people (Waterhouse and Towne, 2005).



The nursing role

Nurses – and epilepsy specialist nurses in particular – can play a valuable role in managing epilepsy in older people. As the professionals who spend the greatest amount of time with patients and their carers, they may be best placed to gain vital information about the circumstances around the event, which is important in establishing (or excluding) a diagnosis of epilepsy.

Nurses also play a role in offering reassurance, information and support to patients and their families following the diagnosis, giving advice on all aspects of the condition, including its management, treatment and lifestyle implications. They can encourage and support patients to live as full lives as possible by discussing concerns an epilepsy diagnosis may raise, including driving, working, safety and leisure issues. Epilepsy specialist nurses also have a role in the follow-up of patients and monitoring their response to treatment – a role which has proved valuable (Risdale et al, 1999).

Conclusion

Epilepsy is a common and increasing problem in an ageing population. It can be difficult to diagnose but can be treated effectively. Treatment can be complicated by underlying comorbidities, polypharmacy and concomitant functional impairment. AEDs provide good control, which is frequently achieved by monotherapy, but should be introduced at a low dose and stepped up slowly. If left untreated epilepsy can lead to loss of independence (including nursing home placement), social isolation and depression. **NT**

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