Management of Epilepsy in the Elderly

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Epilepsy in the Elderly: Epidemiology

- Incidence of both epilepsy and acute symptomatic seizures increased in old age
  - Now the group with highest incidence of epilepsy
    - >100 per 100,000/year
    - Progressive increase with age, at least 1% in >60, 1.5% in >75
    - 85.9 per 100,000 in those aged 65-69; 135 per 100,000 in those aged >80

- After stroke and dementia, commonest neurological condition in this group

- Prevalence also increased but not in the same proportion
Incidence and Cumulative Incidence of Epilepsy

Age-specific incidence rate, cumulative incidence rate and prevalence rate of epilepsy in Rochester, Minnesota (1983–1974)

Hauser et al, 1993
Epilepsy in the Elderly: General Management

- Diagnosis must be firmly established
- Identification of background aetiology
- Identification of precipitants, if any
Diagnosis

- Are the events seizures?
- What sort of seizures?
- Why do they occur?
  - Any precipitants?
- Any other concurrent illness?
Diagnostic algorithm

Elderly adult presents with frequent undiagnosed falls, “funny turns”, or blackouts

Obtain detailed history from patient or witness

Try to make a clinical diagnosis then consider what investigations or referrals might then be appropriate. Consider the need for bone protection

Simple falls?
Refer to elderly medicine service

Syncope?
Refer to cardiology or elderly medicine service

Transient ischaemic attack?
Refer to neurology, stroke, or elderly medicine service

Epilepsy?
Refer to epilepsy specialist

Uncertain?
Refer to elderly medicine, neurology, cardiology or epilepsy specialist

Brodie et al., 2009
Diagnostic algorithm II

Brodie et al., 2009
Epileptic Seizures in Elderly: Aetiology

- Acute symptomatic seizures:
  - Acute stroke
  - Metabolic imbalances
  - Infection
  - Toxic
  - Drugs
  - Alcohol
  - Convulsive syncope
Epilepsy in Elderly: Aetiology I

- Great majority of cases are localisation-related
- Cryptogenic cases rare
- Idiopathic epilepsy rare
  - GTC
  - SME
  - “De novo” non-convulsive status epilepticus
Epilepsy in Elderly: Aetiology II

- CVD in 50% of identified causes (30-50%)
- Neurodegenerative disorders 10-20%
- Head Trauma (secondary to falls) - 10% (10-20%)
- Tumours in about 10% (10-30%)
  - Usually metastatic
  - Primary tumours: gliomas and meningiomas
Epilepsy in Elderly: Aetiology III

- Less common causes:
  - Head injury
  - Subdural haematoma
  - Non-vascular dementia
  - CNS infections
De Novo Non-Convulsive Status Epilepticus in the Elderly

- 1 year prospective study of episodes of confusion of unknown origin (CUO) in patients aged >60 years in Grenoble
- Of the 44 patients identified, 7(16%) presented with deNovo NCSE
- No statistically significant features between people with NCSE and other causes of confusion
- No difference in clinical outcomes

Veran et al., 2010
### De Novo Non-Convulsive Status Epilepticus in the Elderly II

Veran et al., 2010

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age (y)</th>
<th>Gender</th>
<th>Neurologic History</th>
<th>Treatment</th>
<th>Diagnostic</th>
<th>NCSE</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>79</td>
<td>F</td>
<td>Stroke</td>
<td>None</td>
<td>Symptomatic</td>
<td>CPSE (left frontal)</td>
<td>Good</td>
</tr>
<tr>
<td>#2</td>
<td>97</td>
<td>F</td>
<td>Dementia</td>
<td>Cortisone</td>
<td>Symptomatic</td>
<td>CPSE (diffuse)</td>
<td>Death</td>
</tr>
<tr>
<td>#3</td>
<td>60</td>
<td>F</td>
<td>None</td>
<td>SSRI, BZD</td>
<td>Weaning in BZD</td>
<td>Absence</td>
<td>Good</td>
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<tr>
<td>#4</td>
<td>73</td>
<td>F</td>
<td>Seizure</td>
<td>None</td>
<td>Encephalitis</td>
<td>CPSE (diffuse)</td>
<td>Sequelae</td>
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<tr>
<td>#5</td>
<td>72</td>
<td>F</td>
<td>None</td>
<td>None</td>
<td>Cryptogenic</td>
<td>CPSE (diffuse)</td>
<td>Good</td>
</tr>
<tr>
<td>#6</td>
<td>71</td>
<td>F</td>
<td>Stroke</td>
<td>SSRI, Tramadol</td>
<td>Symptomatic</td>
<td>CPSE (diffuse)</td>
<td>Good</td>
</tr>
<tr>
<td>#7</td>
<td>80</td>
<td>F</td>
<td>Stroke</td>
<td>Carbamazepine</td>
<td>Symptomatic</td>
<td>CPSE (left frontal)</td>
<td>Good</td>
</tr>
</tbody>
</table>

BZD, benzodiazepine; SSRI, selective serotonin reuptake inhibitor; NCSE, nonconvulsive status epilepticus; CPSE, complex partial status epilepticus.
Epilepsy in the Elderly: Seizure Type

- Majority of seizures are partial (with or without secondarily generalisation)

- EEG evidence necessary in some cases to show focal onset

- EEG also helpful in IGE

Kellighaus et al., 2004; Brodie et al., 2009
Epilepsy in the Elderly: Diagnosis

- The diagnosis of epilepsy is entirely clinical
  - Bona fide history of unprovoked epileptic seizures
    - Presence of aura
    - Stereotyped event
    - Post-ictal confusion or persistent headaches

- Eyewitness account may be missing
  - Home video recording can be very useful
  - Hospital admission may be useful

- If after investigation diagnosis not clear let time decide
Epilepsy in the Elderly: Differential Diagnosis

- Diagnostic ascertainment may be difficult if witness account missing
  - Syncope
    - Carotid sinus syncope
    - Postural hypotension
    - Micturition syncope
  - Problems with cerebral circulation
    - TIA
  - Hypoglycaemia
  - Neuro-psychiatric diseases
The Treatment of Epilepsy in the Elderly: General Management

- **Holistic approach**
  - Reassurance and education of patients and carer
  - Safety aspects
  - Risk assessment
  - Mobility

- **Multidisciplinary assessment**
  - Nurse
  - Social worker
  - Occupational therapist
Mortality in the Elderly: Data from the NGPSE

*Neligan et al., 2010*

*Figure 1* All cause mortality by age-group during follow-up in the combined group with definite and possible epilepsy, people with definite epilepsy and the subgroup with idiopathic epilepsy.
Epilepsy in the Elderly: Treatment

- **First unprovoked seizure:** to treat or not to treat?
  - Structural lesion
  - EEG?

- **Recurrent unprovoked seizures are usually treated**
  - Long gap between seizures
  - Patient unlikely to be compliant
Goals of Treatment

- No seizures
- Mono-therapy / unobtrusive therapy
- No side effects
- Rehabilitation and social adjustment
Which Drug?

- Adverse reactions?
- Interactions?
- Monitoring?
- Compliance?
- Withdrawal?
Epilepsy in the Elderly: Which AED?

- Current 1st line treatment
  - Carbamazepine
  - Valproate
  - Lamotrigine
  - Topiramate
  - Oxcarbazepine

- Other options
  - Gabapentin
  - Levetiracetam
  - Phenytoin
Epilepsy in the Elderly: Principles of AED Treatment I

- Start low
- Go slow
- Titrate to response
Epilepsy in the Elderly: Principles of AED Treatment II

- Monitor potential side effects
  - Cognitive side effects debilitating!
- Monitor drug interactions
- Drug levels useful to check compliance
RCT - New onset epilepsy in the Elderly

- 18-centre randomised double-blind, double dummy, parallel study of 593 elderly (mean age 72 years) with new onset epilepsy
- Most common aetiology - cerebral infarction
- Randomized to one of 3 groups: GBP 1500mg/day; LTG 150mg/day; CBZ 600mg/day
- Primary outcome measure: retention in the trial for 12 months

Rowan et al., 2005
Percentage of patients remaining in the trial over time (52 weeks)
Percentage of patients remaining seizure-free over time (time to first seizure)
Epilepsy in the Elderly: AEDs

- Carbamazepine
  - *First line drug for partial epilepsy*
    - Autoinduction
    - Enzyme inducer
    - Idiosyncratic side effects
    - Bone disturbance?
    - Hyponatraemia
    - Low WBC
    - Cardiac conduction
Epilepsy in the Elderly: AEDs

- **Sodium Valproate**
  - *First line broad spectrum AED*
    - Not an enzyme inducer
    - Idiosyncratic side effects rare in this group
    - Low platelet counts
    - Gastrointestinal problems
    - Tremor
    - Sedation
    - “Reversible dementia”
Epilepsy in the Elderly: AEDs II

- Lamotrigine
  - *First line broad spectrum AED*
    - No autoinduction
    - Not an enzyme inducer
      - Effect on bones?
  - Well tolerated
  - No cognitive impact
  - Idiosyncratic side effects
Epilepsy in the Elderly: AEDs III

- **Phenytoin**
  - *Second line AED for the elderly?*
    - A strong enzyme inducer with non-linear kinetics!
    - Narrow therapeutic gap
    - Idiosyncratic side effects
    - Sedation
    - Bone disturbance
    - Folate deficiency
Individual total phenytoin serum concentrations in 3 subjects
Variation in serum phenytoin levels in NH residents

Birnbaum et al., 2003
Other AEDs in the Elderly

- **Gabapentin**
  - Little or no interactions
  - Well tolerated?
  - Efficacy?
Other AEDs in the Elderly II

- **Topiramate**
  - Small potential for interactions
  - Tolerability a problem
    - kidney stones
    - cognitive slowing
    - weight loss
  - Efficacious
Other AEDs in the Elderly III

- **Levetiracetam**
  - Small potential for interactions
  - Well tolerated
  - Efficacious

- **Oxcarbazepine**
  - Small potential for interactions
  - Well tolerated
  - hyponatraemia?
  - Efficacious
New AEDs: Concerns

- Chronic safety profile
- Cost-efficacy
- Lack of appropriate trials in special groups
Epilepsy in the Elderly: Treatment Failure

- Review diagnosis
- Check compliance
Epilepsy in the Elderly: Conclusions

- Seizures usually easy to treat
- Multidisciplinary approach a must
- Tailor drug to patient
  - carbamazepine or valproate or lamotrigine?
- Low threshold for side effects
  - Cognition, bone health
- Which new drug?
  - levetiracetam?, oxcarbazepine?
- Prognosis dependent on background aetiology