Version 2.0

Evaluation of the first seizure in adults

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Introduction

A seizure is a sudden change in behaviour that is the consequence of brain dysfunction:

- Epileptic seizures result from electrical hypersynchronization of neuronal networks in cerebral cortex. Recurrent and either genetically determined or acquired. ~0.5-1% pop.
- Nonepileptic seizures (NES) are not associated with the typical neurophysiological changes of epileptic ones.
    - Physiological - metabolic derangement or hypoxemia
    - Psychogenic (pseudoseizures) - stressful psychological conflicts or major emotional trauma. Patients usually have psychiatric history.

The pharmacological treatment of epileptic seizures is directed at restoring neuronal function to normal, while the treatment of NES is specific to the disorder that triggered the seizure. See "Status epilepticus in adults").

Causes

Epileptic seizures

- Idiopathic or genetic - the majority
- Congenital – brain malformed, perinatal event
- Metabolic - inborn errors e.g. PKU
- Trauma - head trauma
- SOL - brain tumors
- Vascular - stroke, SAH, AVMs
- Degenerative – Alzheimers
- Infective – meningitis, encephalitis
- Toxins - withdrawal states (EtOH, BDZ), and iatrogenic drug reactions

Physiological nonepileptic seizures

- Hyperthyroidism
- Hypoglycemia
- Nonketotic hyperglycemia
- Hyponatraemia
- Hypocalcemia
- Renal failure and uremia (esp. myoclonic)
- Porphyria
- Cerebral anoxia – Cx of cardiorespiratory arrest, CO poisoning, drowning, syncope
- Narcolepsy

Classification:

Partial (focal, local) seizures

Simple partial seizures (usually conscious)

- Focal motor symptoms - ± Jacksonian march, postural, speech
- Special sensory
- Autonomic
- Psychic (e.g. déjà vu, hallucinations)

Complex partial (impaired consciousness)

- Often arise from temporal lobe and ± aura
- Automatisms, stereotyped for individual
- Post-ictal confusion

Secondary generalised

Generalized seizures (usually impaired consciousness)

Non-convulsive (absence)

- Awareness briefly lost
- EEG typically shows 3/sec spike and slow wave complexes

Convulsive

- Tonic-clonic seizures - ± initial ictal cry or Todd's paresis
- Tonic seizures
- Clonic seizures - rare
- Atonic ("drop attacks")
- Myclonic seizures – may be conscious

Unclassified seizures

Differential Diagnosis

Younger patients:

- Syncope
- Psychological disorders
- Sleep disorders
- Paroxysmal movement disorders
- Migraine
- Miscellaneous neurologic events

More common in the elderly are

- Transient ischemic attack
- Transient global amnesia
- Drop attacks

Clinical Features

History from patient and witnesses.

- Pre-seizure events, ictal & post-ictal behaviours.
- Seizure triggers? e.g. strong emotions, intense exercise, loud music, and flashing lights.
- Threshold lowered? E.g. fever, menstruation, lack of sleep, EtOH, and stress.
- Past medical history – fits, head injury, stroke, Alzheimer's disease, history of CNS infection
- Medications/drug/EtOH use.
- Family history of seizures especially absence seizures and myoclonic seizures.

Physical and neurologic examination generally unrevealing for epileptic seizures

- If secondary: meningism (infection or hemorrhage), trauma, localising signs (SOL)

Investigations – mostly low yield

Urine: Toxicology occasionally useful

Bloods: FBC, UEC, glucose, CMP, βhCG, rarely tests for porphyria. Post-ictal metabolic acidosis, ↑WCC, ↑PRL, ↓HCO_3^-, ↓PO_4^- may occur.

EEG: Probably most useful inv if asymptomatic patient. Debate over when to perform.

Imaging: All should have one. CT – Yield (<10%) unless focal signs, MRI better for structural anomalies. Immediate CT scan if any of following, else outpatient scan is OK:

- Age>40
- Anticoagulation
- Focal deficits
- Fever
- Trauma
- Cancer
- ?HIV
- Partial seizure
- Long post-ictal state
- EtOH related

Lumbar puncture: If CNS infection considered.

Management

- Treat seizure as in Status Epilepticus article.
- Ongoing anticonvulsant – consider if precipitant found and not easily/definitively treatable.
- Driving – State-dependent. Variable 1-24 mo depending on classification/circumstances.
- Hospitalization if a prolonged post-ictal state/incomplete recovery, status epilepticus, the presence of a systemic illness that may require treatment, head trauma.
- Referral to neurologist if unsure of diagnosis, focal seizure or focal findings on examination or EEG.

Prognosis

Recurrence risk factors

- Age<50
- FHx
- 2nd seizure within 7 days
- Cerebral tumour
- Prior neurological insult