Seizures

Summary from Rosen's By John R. Corker

Epidemiology

- >10% of the United States' population will experience at least 1 seizure in their lifetime.
- Account for 3% of EMS transports, 2% of Pediatric ED visits, and 1% of overall ED visits.
- 3% of the US population diagnosed with epilepsy, 7% of patients in ED with seizures are in status epilepticus.
- Febrile seizures occur in 2-5% of children age 6 months to 5 years.
    - 20-30% of these have at least one recurrence.

Pathophysiology

- Abnormal increased activity of cortical initiating neurons that activate adjacent neurons, propagating the abnormal signal.
    - This abnormal neuronal activity can remain localized (focal) or propagate to subcortical structures, affecting consciousness (generalized).
- At the cellular level, pathophysiology is poorly understood.

Differential Diagnosis

- Nonepileptic convulsions (pseudoseizures)
- Syncope
- Primary Seizure – unprovoked and not linked to an inciting event
    - *Epilepsy* – recurrent, unprovoked seizures caused by genetically determined or acquired brain disorder
- Secondary Seizure:
    - Trauma
    - Infection
    - Intoxications and Poisonings
    - Organ failure
    - Other metabolic disturbances (*hypoglycemia* most common)
    - Cerebral Tumors
    - Pregnancy
    - Supratherapeutic levels of some anticonvulsants
- *Status Epilepticus* – at least 5 minutes of persistent seizure activity or a series of recurrent seizures without intervening return to full consciousness.

**Table 18-2, page 158 of Rosen Volume 1 (8th Edition) is particularly helpful.

Signs and Symptoms

- Post-ictal state (except atonic seizures)
- Retrograde amnesia
- Incontinence (can also occur with syncope)
- Tongue laceration or buccal maceration
- **Ictal events have six properties:**
    - Abrupt onset (no aura)
    - Brief duration (90-120 seconds)
    - LOC (*except* focal)
    - Purposeless activity
    - Unprovoked (*exceptions*: fever in children and substance withdrawal in adults)
    - Postictal state (*except* focal and absence)

Work-up

- Patient should be taken to a monitored area of the ED and prepped for immediate physician evaluation.
    - IV access, bedside glucose, medication review
- If patient no longer seizing on arrival:
    - H&P, focusing on possible precipitants
- If patient actively seizing on arrival:
    - Secure and maintain the airway (nasopharyngeal often adequate with patient on his/her side)
    - Confirm pulse, cerebral blood flow and adequate oxygenation

    - Administer benzodiazepine (1st line therapy) if in status epilepticus
        - See table 18-3, page 158 Rosen Vol. 1 (8th ed.) for other/2nd line therapies
- Blood tests and EEG are generally unhelpful, although serum sodium is always important to assess.
    - Serum anticonvulsant levels, LFT's and tox screen only when indicated/suspected.
- CT scan indicated for:

- First seizure
- Fever and/or headache
- Acute intracranial process suspected
- H/o acute head trauma
- H/o malignancy
- Immunocompromise
- H/o anticoagulation
- New focal neurological deficit
- Age > 40 years w/o h/o epilepsy
- Focal onset b/f generalization
- Persistently AMS

Empiric Management

- Reversible causative disorders should be considered first and treated.
- Acute antiepileptic therapy depends on odds of recurrence, underlying predisposing disease and medication risks.
- Chronic antiepileptic therapy should be discussed with a Neurologist at follow-up after ED d/c.

Disposition

- Admit:
    - New-onset seizures with abnormal CT or persistent focal deficits
- D/c home with early referral to Neurologist:

    - Normal neurological exam
    - No significant medical comorbidities
    - No known structural brain disease
    - Don't require antiepileptics or multiple benzo doses in ED
    - Can reliably comply with d/c and f/u instructions
    - Given state-specific guidelines re: driving and other potentially dangerous activities