Disclosure: Video EEG for Spells & Sz (Pediatrics)

Relevant financial relationships

• None

Off-label/investigational uses

• None
5 day old twitching
Movements are…
A. Sleep myoclonus
B. Tic
C. Seizure
D. Jitter
Neonatal seizures

• Seizures
  • Clonic ++++
  • Tonic ++
  • Bicycling least likely epileptic sz

• EEG
  • Focal
  • Low frequency sharps or delta
  • 20+ seconds
  • Regionalized
10 day old with twitching…
10 day old with twitching
Movements are

A. Chorea
B. Myoclonus
C. Seizure
D. With-drawl
Neonatal Hypocalcemia

• 2-3 days
  • Preterm, HIE, maternal DM, IUGR

• 3-7 days
  • Cow milk feeds developing countries (phosphate +++)
  • Transient hypoparathyroidism

• Infants
  • DiGeroge syndrome, PTH receptor defects, Vit D
7 month old with cyanotic seizure
7 month old with cyanotic seizure

Movements are...

A. Reflux
B. Breathholding
C. Atonic seizure
D. Hypomotor seizure
7 month old with cyanotic “seizure”
7 month old with cyanotic seizure
7 month old with cyanotic seizure
Progressive Bradycardia
Breath-holding

• Cyanotic

• Pallid
5 month old with stiffening...
5 month old with Stiffening

- Onset 4 months old
- Episodes while awake sometimes after feeding
- Head deviation, eyes open
- ?“Mild HIE” @ birth (?prolonged labor)
7 month old with cyanotic seizure
Movements are...

A. Tonic focal seizure
B. Torsiona dystonia
C. Reflux
D. Fencer posturing
Sandifer’s syndrome

- Gastroesophageal reflux / esophagitis, / hiatal hernia
  - Spasmodic torsional dystonia
  - Back arching
  - Rigid opisthotonic posturing
  - Neck, back, and upper extremities

- VEEG + pH probe
10 month old with stiffening
Electrodecremental Response
8 mo with clonic movements

A. Tonic clonic seizure
B. Self-stim behavior
C. Clonic seizure
D. Sandifer’s syndrome
5 year old with twitching

• Presents after 1 nocturnal GTC
BRE – electro-clinical evolution

Age= 3y 5y 10y

Clinical seizures

EEG spikes
10 year old with staring

A). Complex partial seizures
B). HV response
C). Absence
D). Day dreaming
# Staring spells

<table>
<thead>
<tr>
<th>Feature</th>
<th>Complex partial seizures</th>
<th>Absence</th>
<th>Day dreaming spells</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onset</strong></td>
<td>May have simple partial onset</td>
<td>Abrupt Variable</td>
<td></td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>Usually &gt;30 s</td>
<td>Usually &lt;30 s</td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Awareness</strong></td>
<td>No</td>
<td>No</td>
<td>Partial</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td>Active or passive</td>
<td>Active or passive</td>
<td>Always in <strong>passive</strong> state</td>
</tr>
</tbody>
</table>

**Staring spells**

- Complex partial seizures: Abrupt variable duration, with active or passive state during the spell.
- Absence: Usually <30 s duration, with no awareness.
- Daydreaming spells: Always in passive state.
Childhood Absence Epilepsy

- 2.5-5 Hz bi-synchronous and symmetrical spike and wave
- Frontal central voltage predominance
- Precipitated by hyperventilation
- May be associated with OIRDA
- Discharges fragmented during sleep
Generalized Epilepsy Syndromes

Idiopathic

CAE  JAE

1m  1 y  2y  5y  10y  15y  18y  Adult
16 year old with random body jerks are

A. Non-epileptic events (pseudo-seizures)
B. Tic
C. Myoclonic seizures
D. Partial complex sz
Juvenile Myoclonic Epilepsy

- Polyspike & wave (3.5-6 Hz)
- Anteriorly dominant
- Activated by photic
- Fragments in sleep
Juvenile Myoclonic Epilepsy

• Most common idiopathic PGE
• 4-6% of all epilepsy
• Familial (40-50% have family h/o epilepsy)
• Myoclonic seizures: 100%
  • 2-3 years before 1st GTCS
  • Usually in am
  • Primarily involves UE
• GTCS: 90%
  • Usually in am
• Both most often 1-2 hours after awakening
• Absence: 35%
• 9 mo abrupt onset seizures @ 7 mo when noted L handed
• Seizures:
  • Right eye versive → right arm clonic seizure
  • Bilateral asymmetric tonic sz → generalized clonic seizure
• AEDs:
  • PHB, OXC, TPM, PHT
• ↑ 14-30 sz/day → encephalopathy
Hemi convulsive seizure
EPILEPSY EVALUATION

- Interictal EEG:
  - continuous slow, lateralized left hemisphere
  - Sharp wave regional left frontal and left temporal

- Ictal EEG:
  - EEG seizure, lateralized left hemisphere maximum left frontal
  - Bilateral asymmetric tonic seizure -> generalized clonic seizure
    (total 9 seizures recorded in 2 evaluations one month apart)

- Outside MRI: Left hemimegalencephaly

- PET scan: not done
8 year old with seizures

- Born 26 wks – had ?IVH
  - No identifiable residuals @ 6 mo

- 3 years old 1\textsuperscript{st} status – thought to have had a left MCA stroke

- 5 yrs noted falls while waking – attributed to hemi-paresis

- 8 yo hemi-plegia worsening seizures
Catastrophic Epilepsy Syndromes

- Hemi-megalencephaly
- Rasmussen’s E
- West
- LGS

1m 1 y 2y 5y 10y 15y 18y Adult
Conclusions

• CE spectrum of electro-clinical disorders over a wide age range
• Semiology, Imaging, Natural history necessary for proper diagnosis
• EEG central to diagnosis
• EEG guides therapy!
• Prognosis poor, however, look for treatable conditions