PEDIATRIC NEUROLOGY: Practical Pearls and Pitfalls for Nurse Practitioners

David Bettis, M.D.
Pediatric Neurologist
St. Luke’s Children’s Neurology
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Outline

- Pre-test
- Evaluating abnormal head size in infants
- Epilepsy in pediatrics
- Neuroimaging in pediatric headaches
- Miscellaneous
- Questions and issues from your experience
TRUE OR FALSE?

“Most children outgrow epilepsy.”
Case #1

- Mother brings in 4 month old infant for evaluation of seizures
- Baby has had multiple events of extremity jerking lasting a few to several seconds, no color change
- On further questioning, you discover events only occur when child is falling asleep while breastfeeding
- Baby entirely healthy otherwise, normal birth history, development, exam
- What diagnosis do you suspect?
- What test(s) should be ordered?
Case #2

- Very worried mom brings in a 6 yo girl with 1st seizure
- Child came into parent’s room previous night with twitching of R mouth and hand, unable to speak but scared and crying. Lasted a few minutes, then child upset briefly but normal. No weakness or fever.
- Previously healthy, nl development, nl exam.
- Family history negative for epilepsy
- What is diagnosis you suspect? Good, bad, not sure?
- What test should be ordered?
QUESTION:
What is the most common cause of seizures in children?
QUESTION

Following a first unprovoked seizure in a child with normal exam and EEG, the risk of recurrence is:

1. 5%
2. 20%
3. 30%
4. 50%
5. 70%
Evaluating macrocephaly

One of the first things to do in evaluating abnormally large head size in infants is:

1. Cranial CT scan
2. Cranial MRI scan
3. Cranial ultrasound
4. Other
QUESTION: History of Nurse Practitioners

- Who started the nation’s first nurse practitioner training program?
- What year?
- What city? What institution?
- What was the focus of that program?
ABNORMAL HEAD SIZE

- Macrocephaly
- Microcephaly

Accurate measurement of OFC (occipitofrontal circumference)

Plot on growth curve (correct for prematurity)

Is patient’s curve “crossing percentiles” (instead of parallel)

What is the most common cause of large head size in infants???

*Familial macrocephaly* (measure parents)
Epilepsy in Children

- Misconceptions
- Angst & fear in parents and patients
- Most common types of seizures
- Appropriate workup
- Diagnosis
- Causes of epilepsy
- Prognosis
Pediatric Epilepsy Misconceptions

- Epilepsy is a lifelong condition
- Myths about seizure first aid
- Seizures commonly are fatal
- Epilepsy often causes developmental delay, mental retardation, “dane bramage”
- Epilepsy is something to be ashamed of, concealed
- Many others
Anxiety and Terror in Parents

- Compared to other potentially life threatening medical conditions in children (asthma, congenital heart disease, diabetes), epilepsy causes a higher level of parental angst.
- “Your brain is where you live”... and who you are!
- Be aware and expect high anxiety in parents when evaluating seizures in children.
- If you don’t take parents seriously, you may appear nonchalant or uncaring.
- First seizures generate the most anxiety!
First Unprovoked Seizures

- Epilepsy defined as more than one unprovoked sz
- 5% of all normal children have febrile seizures, the most common cause of seizures in humans
- Estimates are that up to 10% of all people have at least one seizure in their lifetime
- Prevalence of epilepsy is about 0.9% in population
- Ratio of first seizures to epilepsy is ~20:1
- Following first unprovoked seizure in child, risk of recurrence is about 30% if EEG and exam normal
Imitators of Seizures in Children

Not everything with altered/loss of consciousness is sz!

First question to ask: Was it a seizure or not???

- Benign sleep myoclonus of infancy
- Breath-holding spells
- Self stimulatory behaviors in developmental delay
- Absence seizures confused with daydreaming, boredom, being overwhelmed, fatigue, etc.
- Syncope in teenagers
- Psychogenic events (pseudoseizures)
Common Seizure Types in Children

- Neonatal seizures
- Benign febrile seizures of childhood
- Absence epilepsy
- Benign partial epilepsies of childhood
- Juvenile myoclonic epilepsy
Neonatal Seizures

- Common age of onset of seizures: infants and seniors
- Serious causes: birth asphyxia, intracranial hemorrhage, malformation, genetic syndrome, inborn error of metabolism, shaken baby syndrome, etc.
- Neonatal seizures may be subtle (bicycling, swimming movements, non-nutritive sucking)
- EEG monitoring may be useful to clarify diagnosis
- There are benign imitators of seizure in babies!...
Benign Sleep Myoclonus of Infancy

- Sleep myoclonus is a normal phenomenon.
- Disinhibition of brainstem/spinal cord when cortex goes to sleep.
- In older patients, usually a single myoclonic jerk.
- In babies, can be briefly repetitive.
- Mothers notice this when breastfeeding!
- Treatment: Reassurance, observation for worsening or more neurological symptoms, EEG sometimes.
Benign Febrile Seizures

- Onset between ages 6 months and 3 years, peak 18 months
- Brief generalized convulsion
- Associated with elevated temperature
- Rapid and complete recovery
- Otherwise normal healthy child
- Often positive family history of febrile seizures
- Treatment: Reassure, counsel about recurrence risk (~30%), check temp with thermometer, warn babysitters
- Medications RARELY indicated unless complex case (prolonged or frequent seizures)
Benign Rolandic Epilepsy

- Onset between ages 5-10 years
- Simple partial seizure involving face/hand
- Some have GTCs in sleep
- EEG is diagnostic with centro-temporal sharp waves
- Untreated seizure frequency is rare, every few months
- Virtually everyone outgrows condition within a few yrs
- Anticonvulsant treatment usually not needed
- Neuroimaging not indicated
- MANY health care providers unaware of condition although most common type of epilepsy in children!
Absence Epilepsy

- Outdated term “petit mal” (little sickness)
- Age of onset 3-7 years for childhood absence
- Blank staring spell lasting few to 15 seconds
- Sometimes with eyelid fluttering
- Unresponsive during attack
- Immediately back to normal except amnestic
- Key to diagnosis on history: UNINTERRUPTIBLE
- Rule of thumb: If teachers have seen staring spells but NOT parents, usually not absence
- Easily diagnosed with EEG, easily controlled with med
Juvenile Myoclonic Epilepsy

- Usually starts as teenager
- Generalized tonic clonic seizures, often precipitated by sleep deprivation, alcohol, or illness with fever
- “Epidemics” during high school and college finals
- Patients have myoclonic jerks on awakening from sleep or in morning
- Generalized spike-wave on EEG
- Usually easy to control with medication
- Usually lifelong need for meds
Workup of Seizures: HISTORY

- Thorough history is very important in determining whether or not an event was a seizure.
- Loss of consciousness? Altered consciousness?
- Tongue biting, foaming at the mouth, incontinence
- Post-ictal changes; Todd’s paralysis
- Duration of event
- Color change?
- Triggers: fever? head injury? sleep deprivation?
Diagnosis of Seizures/Epilepsy

- Rests on **history** most of the time
- EEG most useful test, helps predict risk of seizure recurrence, can lead to specific epilepsy diagnosis
- Video EEG monitoring higher yield when needed
- Neuroimaging not always needed (benign epilepsies, febrile convulsions)
- MRI is study of choice for anatomical detail
Causes of Epilepsy

- Very different in children compared to adults
- Children more likely to have generalized/genetic epilepsies with better prognosis, more likely to be outgrown
- Adult causes of epilepsy more likely lesional related (stroke, MS, trauma, dementia, etc.) and poorer prognosis, more likely to be lifelong
- MOST CHILDREN OUTGROW EPILEPSY!
Prognosis of Epilepsy in Children

- Generally positive
- Two thirds of epilepsy patients become seizure free on medication
- Be aware of co-morbidities of epilepsy (depression, poor self image, educational underachievement, social stigmatization, underemployment, loss of independence, and more)
- Catastrophic epilepsies of childhood relatively rare (infantile spasms, Lennox-Gastaut syndrome, Dravet syndrome, Doose syndrome), need specialty care
Headache in Children

- Everyone experiences some headaches over the lifespan of humans
- Headaches are common in children
- Is child eating breakfast? Getting enough sleep?
- Migraine can start in preschool children
- Suspect migraine with: nausea, vomiting, visual changes, “sick” or disabling headaches, family history, puberty
- Migraine is treatable with PRN and prophylactic meds when indicated
Headaches and Neuroimaging

- Imaging rarely helpful in chronic nonprogressive HA
- Look for signs of increased intracranial pressure: papilledema, visual loss, constant unremitting headache, nocturnal awakening, very prominent and persistent nausea, unifocal unchanging location of pain, abnormal neuro exam, etc.
- CT is sufficient for screening exam when needed
- Consider pediatric neurology consultation if you are worried enough to order neuroimaging!
History of Nurse Practitioners

- Dr. Henry Silver, pediatrician at Univ of Colorado, started first nurse practitioner program in 1964
- First program was for Pediatric NPs
- If date is accurate, next year is your profession’s GOLDEN (50th) ANNIVERSARY! Are you planning some celebrations involving CME conferences and public awareness?
QUESTIONS?