EPILEPSY ESSENTIALS

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DISCLOSURES

- None

JENNIFER

- 28 yo woman, healthy, taking only OC
- Single episode of LOC
- Briefly had a hot, dizzy feeling, then observed to slump
- Shook briefly
- Entire episode lasted about a minute
- Slightly confused for a minute or 2
- No tongue biting
- Had urinary incontinence
- No trigger

APPROACH TO A SINGLE EPISODE OF LOC

- Differential
  - First seizure
  - Syncope
    - Vasovagal
    - Cardiac
    - metabolic
- Investigations
  - Seizure
    - MRI
    - EEG
  - Syncope
    - Cardiac investigations (EKG, Holter, Echocardiogram)
    - Basic bloodwork (CBC, Glu, TSH, B12, LFT's, Cr)

WHAT DO YOU TELL HER?

- Diagnosis
- Chance of recurrence
- Safety issues and driving

TO TREAT OR NOT TO TREAT?

- You see her 3 months later, she has had no recurrence and is perfectly well
- All of her investigations are normal
- Now what?
  - Do you treat as a possible seizure?
  - What do you tell her?
  - Do you arrange follow up?

RECURRENCE

- 2 months after your last visit, she has a second similar episode
- Do you re-investigate?
- Do you treat?
- With what?

EPILEPSY

- 4th commonest neurologic disorder, behind migraine, stroke and Alzeihmer's
- Defined as >1 unprovoked seizure
- Prevalence is approximately 8/100,000
- In Canada approximately 15,500 people are diagnosed with epilepsy each year
- Lifetime risk of developing epilepsy is 1/26
- Greater risk in the young and the old
- 50-60% of unknown cause
- High economic burden

CLASSIFICATION OF SEIZURE TYPES

- New classification (ILAE, 2017) is difficult to understand and apply and is for research
- Old classification is easy and practical and is still used by most neurologists
  - Focal/Partial epilepsy
    - Simple – without loss of consciousness
    - Complex – with loss of consciousness
  - Generalized epilepsy
    - Absence
    - Tonic-clonic
    - Myoclonic
    - Atonic

EPILEPSY SYNDROMES

- Defined by a group of features commonly seen together, such as seizure type, age of onset, genetic predisposition, part of the brain involved, characteristic EEG abnormalities, prognosis, etc.
- When recognized by neurologists, can provide useful prognosis for the patient and often guides the choice of drug therapy
- Many, many are defined by epileptologists
  - Juvenile Myoclonic Epilepsy
  - Lennox-Gastaut
  - Rasmussen's
  - Infantile spasms
  - Dravet

ANTI-EPILEPTIC DRUGS

- Older (pheytoin, carbamazapine, phenobarbital, primidone, valproic acid, valium, ethosuximide)
- Newer (gabapentin, pregabalin, clobazam, topiramate, lamotrigine, Keppra (levatiracetam), Trileptal (oxcarbazepine), Vimpat (lacosamide), Brivlera (briveracetam), Aptiom (eslicarbazepine), Fycompa (perampanel), Sabril (vigabatrine), Gabitril (tiagabine), Banzel (rufinamide)
- Pregnancy friendly
  - Carbamazapine, lamotrigine, levatiracetam

HOW DO YOU CHOOSE ?

- Best for generalized epilepsy
  - Valproic acid, clobazam, lamotrigine, levatiracetam
- Best for focal/partial epilepsy
  - Carbamazapine and derivatives, lacosamide, lamotrigine,new drugs
- Broad spectrum
  - Phenytoin, carbamazapine, lamotrigine, levatiracetam, Brivlera
- Cost
  - Pennies/day up to $8.00/day
- Pregnancy friendly
  - Lamotrigine, levatiracetam, carbamazapine

JENNIFER

- 28 yo, had a second seizure
- Healthy
- Wants a pregnancy
- Investigations normal
- Focal vs. generalized seizure?
- Does she have an epilepsy syndrome?
- Perfect choice?
  - Lamotrigine
  - levatiracetam

ALTERNATIVE SCENARIOS – KATHY'S APPROACH

- Older male with limited income
  - Carbamazepine, phenytoin
- Clear primary generalized epilepsy
  - Lamotrigine, levatiracetam, clobazam, valproic acid
- Clear focal onset
  - Lacosamide, carbamazapine derivatives, levatiracetam
- Structural lesion
  - Levatiracetam, carbamazapine
- On multiple other medications
  - Lamotrigine, levatiracetam

JENNIFER

- She has started lamotrigine and feels well on the drug
- Lamotrigine 100mg bid
- She has another seizure, again brief with no injury
- What next?
  - Do nothing?
  - Increase lamotrigine dose? To what?
  - change her to something else?

SPECIAL CONSIDERATIONS IN EPILEPSY

- Pregnancy
- Safety issues/driving
- Drug interactions/toxicity
- Seizure surgery/EMU (epilepsy monitoring unit)

PREGNANCY

- Teratogenicity
  - phenytoin, carbamazepine, valproic acid, topiramate
  - Take folic acid 5mg through childbearing years
- Injury from untreated epilepsy
  - Treat aggressively if potential for injury, especially after the first trimester
- Risk of inheritance
- Labour and delivery
  - Vitamin K for the mother and baby with phenytoin
- Breastfeeding
  - Lamotrigine and levatiracetam best
- Oral contraceptives
  - No concern with lamotrigine and levatiracetam

SAFETY ISSUES/DRIVING

- After a first episode of LOC
  - Clearly syncopal – 3 months
  - Possible seizure – 6 months
  - Patient should be counceled to do nothing where sudden LOC could put themselves or others at risk (driving, height, water, power tools)
- In established epilepsy
  - Safe to resume activities once controlled for 6 months
- SUDEP (Sudden Unexplained Death in Epilepsy)
  - 1/1000 adults and 1/4500 children with uncontrolled epilepsy die each year
  - Likely seizure activity causes heart arrythmia
  - #1 cause of death in epilepsy

SEIZURE SURGERY/EMU

- Patients with uncontrolled epilepsy should be referred to an epileptologist
- Patients are admitted to the Epilepsy Monitoring Unit (EMU)
  - Hooked up to 24 hour EEG monitoring, sometimes with depth electrodes
  - All anti-epileptic medication is stopped
  - Clinical and electrical seizures are carefully monitored
- If only 1 surgically accessible focus for the epilepsy is found, usually in the temporal pole, epilepsy surgery can be considered
  - Continually improving outcomes, with 80% of patients having a reduction in seizures
  - Life altering

OTHER TREATMENTS

- Ketogenic diet
  - Diet very low in carbohydrates and protein where almost all calories come from fat (4 grams of fat for each gram of carbohydrate or protein)
  - Induces ketogenesis (starvation)
  - Elevated ketones in the brain seems to lessen seizure frequency
  - Used in children with intractable epilepsy after many drugs have failed
- Vagus nerve stimulation
  - Pacemaker in chest, wire wrapped around the vagus nerve
  - Regular pulses travel up the vagus nerve to diffuse parts of the brain
  - Helps some with intractable epilepsy

JENNIFER

- You increase her lamotrigine up to 150mg bid
- You get her driver's lisence back and she is again living normally
- HAPPY ENDING!!!
  - You follow her at 6 month intervals and she remains seizure free
  - She has 2 successful pregnancies over 4 years, breastfeeding both her babies for 6 months
- She comes back to you 5 years later and she wants to stop her medication
- What do you tell her?

STOPPING MEDICATION

- Art not always science
- Dependent on how badly the person wants to stop and what the consequences would be if another seizure occurred (driving, work, injury)
- Repeat EEG – maybe sleep deprived to increase the yield of finding an epileptic focus
- If EEG is normal, the best odds that can be offered are approximately a 30% chance of recurrence
- Jennifer must be fully informed and then make her decision
- In children we usually attempt to stop if EEG is normal – much more often successful
- If a seizure recurs – I recommend treating for life
- Do not ever stop phenytoin or phenobarbitol after >10 years of use – seems to trigger recurrence

QUESTIONS?