NEUROLOGICAL EMERGENCIES

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GOALS

- REVIEW COMMON NEUROLOGICAL EMERGENCIES (CASE BASED FORMAT)
  - AUDIENCE PARTICIPATION
- DISCUSS PERTINENT EXAM FINDINGS
- DIAGNOSIS
- TREATMENT

CASE 1- "BLURRED LINES"

- 21 y/o female with history of migraine w/o aura
- Presents with 1 week progressive HA, neck pain, "wavy lines", subjective blurred vision (new symptom), nausea, vomiting. HA is same location as always, worst ever. Not improved with home migraine meds
- AVSS. CBC normal. Exam non-focal
- MRI brain is normal
- Next step?

CASE 1

1. Discharge on percocet
2. Migraine "cocktail", start DHE protocol
3. MRV and LP
4. Conventional angiogram
5. ESR and C-RP, temporal artery biopsy

CASE 1- (Idiopathic Intracranial Hypertension)

- Etiology Unknown
- More common in young, obese females. Associations: hypothyroid, Vitamin A, Tetracycline, steroids, prior trauma.
- DX: MRI/ MRV imaging: always rule out sinus thrombosis. Inquire about OCP, miscarriage, DVTs
- RX:
  - LP (also therapeutic). Opening pressure > 20 cm water
  - Diamox
  - Vision loss: consider optic nerve sheath fenestration/ ophthalmology consult
  - Shunt/drain placement

HEADACHE- WHEN TO WORRY???

- ***"NASTY NINE"*** (courtesy Dr. Robert Kaniecki, UPMC)
  1. First/ Worst
  2. Abrupt onset
  3. Change in pattern/ frequency
  4. LOC/ seizure
  5. Onset Age: <5, >50 yrs
  6. Valsalva/sex
  7. Abnormal neuro/medical exam (ie fever, elevated wbc, etc)
  8. Persistent neuro symptoms for > 1 hour
  9. Medical Hx: Immunocompromised/ HIV/ CA/ pregnant

CASE 2: HEAD DROP

- 65 y/o man with history HTN, HPL
- Presents with 3 months progressive dysarthia, dysphagia, diplopia, difficulty climbing stairs. Occasionally improved in AM. Recent URI. Worsening for 3 days.
- EXAM: severe dysarthria, diffuse limb weakness, neck flexion markedly weak with head drop, b/l ptosis. Sensory exam normal. Reflexes depressed/ symmetric
- MRI brain/ C spine normal as outpatient 10 days prior
- Next step?

CASE 2

1. Discharge to home. Arrange outpatient EMG/ NCS
2. LP- look for albuminocytologic dissociation
3. STAT EMG/ NCS
4. Tell the patient he likely has ALS. Consult Hospice.
5. Admit to ICU, Prepare for intubation
6. CT angiogram head/neck

CASE 2- Myasthenic Crisis

- Def: Myasthenia Gravis exacerbation requiring intubation
- Etiology: AchR antibodies compete with Ach at N-M junction.
- EXAM: fatigable motor weakness. Normal sensory.
- DX: exam/hx, AchR Ab (most specific), Rep Stim on Nerve conduction studies (80% sensitive for generalized), Single fiber EMG (90% sensitive). MusK antibody- rare cases
- ***REMEMBER 3 ANTIBODIES:*** Binding (most common), blocking, modulating
- RX:
  - Exacerbation: steroids, eventually steroid sparing agent (cellcept, immuran). Mestinon (does not modulate disease)
  - Acute Crisis: IVIG or plasmapheresis. Start steroids/long term immunosuppression. Mestinon for symptoms

CASE 3: “UNCONSCIOUS”

- 58 y/o female. HTN, HPL, DM
- Presents to ED. Normal 5 hours prior. Progressive confusion, gait difficulty, diplopia, dizziness, diffuse weakness, drowsy.
- ED: AVSS. irregular breathing. EXAM: does not follow commands, dysconjugate eyes, no movement, hyperreflexia. BMP/CBC/INR normal
- EKG: a-fib. NCCTH: “no acute process”
- Next Step?

CASE 3

1. STAT MRI Brain
2. STAT EEG, give ativan
3. Get labs: HFP, CPK, NH3, ESR. Prepare for LP.
4. STAT CT angiogram head/neck
5. Administer Dantrolene

CASE 3: Acute Basilar Occlusion/ basilar syndrome

- Any combination of the following:
  - Diplopia/ ophthalmoparesis/ dysconjugate gaze
  - Dizziness
  - Weakness: unilateral OR bilateral face/ limbs
  - Dysarthria
  - Ataxia
  - Confusion/Depressed consciousness/ coma
  - Vision loss

CASE 3: Acute Basilar Occlusion

- Some Etiologies
  - cardioembolus (a-fib in this case)
  - atheroembolus from posterior vessel disease: basilar, vertebral, aortic arch
  - Vertebral artery dissection- stroke
  - HC state

CASE 3: Acute Basilar Occlusion

- Treatment
  - IV tPA if candidate (which this patient is not)
  - NOTIFY ANGIO INTERVENTION
  - If TPA given, repeat vessel imaging immediately- usually conventional angio. Mechanical intervention if no recannulization.
  - Investigate etiologies
  - MRI later-already know diagnosis

STROKE- KEY POINTS

1. Suspect stroke- STAT CTH to rule out hemorrhage
2. Next immediate question: "ARE VESSELS OPEN?"
3. Don't delay vessel imaging if possible. GET HEAD and NECK.

   - CTA head/neck
4. Always Remember- anterior AND posterior circulation.

CASE 4: “SPEECHLESS”

- 73 y/o female. Hx a-fib on Coumadin, HTN, HPL, posterior L MCA stroke, mild residual R side weakness.
- acute language loss at dinner, R side weakness.
- ED 2 hours from onset. VSS, basic labs normal. Glucose normal. INR 2.5.
- EXAM: Following no commands, global aphasia, mild R hemiparesis, eyes transiently deviate to the Right.
- STAT CTH and CTA head neck: “no acute process”, “large vessels all patent. Chronic infarct left posterior MCA”.
- Next step?

CASE 4

1. Mix IV tPA
2. STAT EEG. Prepare Ativan 1-2 mg, thiamine. check glucose.
3. Call the neurointerventionalist
4. Admit to floor, order routine stroke workup, MRI
5. LP, start acyclovir

CASE 4: Status Epilepticus

- Status epilepticus: continuous seizure for > 5 minutes, OR recurrent seizure without return to baseline in 24 hours.
- Convulsive or non-convulsive (such as this case)
- Etiologies: many
  - Epilepsy (focal or generalized)
  - focal lesion (tumor, stroke, traumatic injury, etc)
  - severe medical illnesses/sepsis
  - meningitis/ encephalitis
  - medications
  - Metabolic abnormality: hypo/hyperglycemia. Hypocalcemia. hypomagnesemia

CASE 4: status epilepticus

- Treatment (AES guidelines)
  - ABC
  - Thiamine, check glucose
  - IV Ativan (up to 0.1 mg/ kg total. Not all at once!)
  - Load fosphenytoin 18-20 mg/ kg.
  - Still seizing: reload add'l 10 mg/ kg fosphenytoin
  - Still seizing: load PHB 20 mg/ kg. prepare for intubation
  - Still seizing: intubation (if not already done):
    - Propofol
    - Midazolam
    - pentobarbital

CASE 4: status epilepticus

- Workup/ management
  - EEG: STAT, routine, continuous
  - Check labs: normal electrolytes
  - STAT imaging: minimum NCCTH (stroke, lesion, etc)
  - Infectious workup, LP if indicated (fever/infection)
  - MRI
  - Additional seizure medications as needed

CASE 5: “On pins and needles”

- 29 y/o male. No prior PMHx. 5 days progressive paresthesias- toes followed by finger tips. Back pain. Difficulty walking- legs are “heavy”
- Afebrile. HR in 120s. Neuro exam: proximal arm and leg weakness. Length-dependent vibration and sensory loss to the knees, mid forearms. Cannot touch nose with eyes closed. Absent brachioradialis, Achilles reflexes.
- Basic labs normal
- Immediate next step?

CASE 5

1. STAT CTA head/ neck
2. Administer IVIG
3. STAT EMG/ NCS
4. NCCTH- rule out bleed
5. STAT MRI C-spine

CASE 5: AIDP (Guillain-Barre syndrome)

- Etiology: ?? Presumed autoimmune reaction against myelin of peripheral nerves
- Result: ***acute*** sensory-motor ***demyelinating*** peripheral neuropathy (most peripheral neuropathies are ***axonal***)
- Exam: Acute, length dependent neuropathy. ***Areflexia***.
- Back pain, dysautonomia, constipation/urinary retention not uncommon (demyelinating thoracic nerves)
- AXONAL VARIANTS: AMAN, AMSAN, ASAN
- MILLER-FISCHER VARIANT: ataxia, ophthalmoplegia, areflexia: GQ1B Ab

CASE 5: AIDP (Guillain-Barre syndrome)

- DX:
  - NEURO HX/EXAM!!!
  - CSF: albuminocytologic dissociation (elevated protein, normal/ mild elevation WBC). Don't wait for it.
  - EMG/NCS: 11-14 days post-onset.
  - r/o: lyme, CMV, neoplastic/lymphoma

CASE 5: AIDP (Guillain-Barre syndrome)

- RX:
  - IVIG or plasmapheresis. NO STEROIDS
  - Supportive:
    - Check regular NIF/ VC.
    - Treat autonomic dysfunction (risk of death)
    - bowel regimen
    - treat back pain/ neuropathic pain
    - DVT prophylaxis

CASE 6: "SCARED STIFF"

- 1st day on new service. Called to bedside for decreased responsiveness, pt. "not moving".
- 70 y/o man hospital day 6. PMHx HTN, HPL. community acquired Pneumonia. Day 2-delirium.
- Next 3 nights: delirium, severe agitation.
- Febrile 100.8, HR 110, BP stable. BUN 30, Cr 1.5 low urine output
- Exam: stupor, non-verbal, not following commands, very rigid tone
- NCCTH negative. CXR: improving PNA. UA normal. WBC normal

CASE 6

1. STAT EEG
2. STAT MRI
3. STAT CT angiogram head/ neck
4. Prepare for LP ASAP, give vanco/ceftriaxone/acyclovir
5. Ask the medical student to get his medication administration record
6. Intubate

CASE 6

- Student reports he has received 10 mg Haldol total each night for the past 3 nights, due to severe agitation. Reports: “less bright” throughout the morning.
- Next step?

CASE 6

1. STAT EEG
2. LP
3. STAT CPK, HFP. Prepare IV ativan, bromocriptine
4. Load with fosphenytoin
5. Give Provigil for hypoactive delirium

CASE 6: Neuroleptic Malignant Syndrome

- Acute/subacute onset: fever, vital sign abnormalities, altered mental status, parkinsonism/ rigidity
- Etiologies:
  - Neuroleptics: Haldol, atypical antipsychotics. also lithium, VPA
  - Withdrawal of dopaminergic agents (i.e. sinemet)
- Diagnosis: ***FEVERS***
  - Fever
  - Elevated LFTs
  - Vital signs
  - Elevated CPK
  - Renal failure
  - Stiff

CASE 6

- Diagnosis (cont)
  - Rule out infectious/medical causes
  - Medication review!!!
- Treatment/mgmt (American journal of psychiatry,2000)
  - D/C neuroleptics
  - IV Ativan
  - Bromocriptine (DA agonist)
  - amantadine
  - Severe: Dantrolene, ECT

CASE 6

- Treatment (cont.)
  - Supportive care, consider ICU
  - IVF
  - Monitor renal, liver function, CPK
  - Restart dopaminergic meds

CASE 7 “Quadraparesis”

- 19 y/o female. No PMHx. No Meds. Awoke with severe neck pain.
- 5 hours later: gait difficulty, arm weakness, diffuse numbness, difficulty breathing
- ED: respiratory failure. Intubated
- Exam: AVSS. Wide awake, intubated. Blinks and moves eyes to commands. Moves mouth to command. L eyelid appears drooped. L pupil is asymmetrically small. No other CN findings. Quadroplegic. No response to painful stimuli below tops of shoulders. Diffuse hyperreflexia. Toes upgoing.
- NCCTH: normal.
- NEXT TEST???

CASE 7

1. STAT CTA head/ neck: attn. to basilar
2. STAT MRI brain: attention to Pons
3. STAT MRI C and T spine
4. Spinal angiogram ***urgently***

CASE 7

- DX?

1. Basilar occlusion
2. “locked in syndrome”
3. Vertebral dissection
4. AIDP
5. Transverse myelitis

FINAL THOUGHT

- Always ask yourself:
  1. Is there neurologic disease?
  2. Does it localize?
  3. If so, to where?
- No substitute for the neuro exam
- Essentials of stroke
  - r/o hemorrhage
  - vessels open?
- Neurological emergencies are treatable!! Recognize them quickly!!

THANKS!!