Infectious/Inflammatory and Demyelinating Diseases

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University of Virginia
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NeuroCritical Care Society
Montreal, Canada
2011
Disclosures

• I (unfortunately) receive no Federal, State or Commercial support.
• No off label use of drugs or therapies will be discussed.
Disclosures

• I can’t possibly do a talk in 30 minutes, so here it is in 30 seconds

• Don’t Blink

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Question 1

• 36 yo male presents with 24h of severe HA, N/V and photophobia. Exam with fever of 38.3°C, stiff neck, decreased LOC, L hemiparesis.

• Head CT normal.

• LP OP 23cmH₂O, cloudy, 6500 WBC (98%PMN), Pr.= 110mg/dl, Glu.= 33 mg/dl. GS=G+diplococci

• Question: Appropriate empiric treatment of this syndrome:
  (A) Dexamethasone 4mg i.v, then Doxycycline 100 mg p.o. bid.
  (B) 3rd Generation cephalosporin and vancomycin with the addition of Dexamethasone only if cultures turn positive.
  (C) Dexamethasone 4mg i.v, then high dose 3rd Generation cephalosporin and vancomycin
  (D) Ampicillin, 3rd Generation cephalosporin and vancomycin
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  (D) Ampicillin, 3rd Generation cephalosporin and vancomycin
Question 1

- Pneumococcal meningitis
  - Dexamethasone before or during antibiotic administration, vanco (for resistant pneumococcus), 3rd gen cephalosporin.
Question 2

• A 67 yo F with PMH of HTN and Type II DM presents with a 3 week history of headache and fever. The headache is worse when she is supine. She is admitted to the hospital for acute onset of altered mental status.

• On exam she is febrile and minimally responsive. She has a stiff neck.

• CBC
  – WBC=17k 93% PMN
Question: The patient is started on broad spectrum antibiotics. Which of the following is true regarding this condition:

(A) An LP should be performed on this patient to attempt to identify the organisms

(B) The patient’s rapid clinical deterioration is likely secondary to mass effect caused by the lesion.

(C) Surgical drainage of the lesion, in addition to antibiotic therapy is recommended.

(D) There is a high likelihood that this patient’s illness began with meningitis which subsequently spread transependymally to the brain parenchyma.
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(C) Surgical drainage of the lesion, in addition to antibiotic therapy is recommended.
(D) There is a high likelihood that this patient’s illness began with meningitis which subsequently spread transependymally to the brain parenchyma.
Bacterial brain abscess
Drain over 2.5 cm
Broad spectrum abx: MRSA, gram (-) including Pseudomonas, anaerobes
Question 3

- An 86 yo M is brought to the ICU in the late Summer for rapidly declining mental status and respiratory failure. Prior to admission he had 10 days of a fever, headache, fatigue, myalgias and anorexia. Over the last 2 days his headache and mental status has worsened.

- On exam he is febrile (38.9°C). Intubated. Comatose. He withdraws his LE’s briskly, but he has weak withdraw in his UE’s (bilaterally). Reflexes are diminished in his UE’s and increased in his LE’s. His NIP/NIF is 12 cmH₂O. He cannot participate in VC measurement.
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**Question:** His **requirement for mechanical ventilation:**

(A) Will diminish after he receives treatment with Acyclovir.
(B) May be permanent if he survives the acute phase of his illness.
(C) Is likely due to his severely diminished level of consciousness.
(D) Is minimal. He was likely intubated for transport to your hospital.
(E) Is a result of an abnormality of the neuromuscular junction.
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Question 3

• **West Nile Virus**
  – Summer/fall months (mosquito vector)
  – Flu-like illness
  – Encephalitis and motor neuron necrosis
    • Worse in immunosuppressed and elderly
    • Neuromuscular weakness may improve, depending on the extent of damage
  – No treatment/only supportive care
Question 4

• 36 yo M presents to his physicians office with severe mid-low back pain, malaise, fatigue and fever. He is sent home with ibuprofen. Over the course of the next several days he develops more severe back pain, radicular pain in his right leg and urinary retention.

• He has a history of an MVA 3 years ago with chronic back pain since the accident.

• On exam he has pain to palpation along his spinous processes in his lower thoracic/upper lumbar area. He has mildly weak LE’s bilaterally (R>L).
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**Question:** Performing a LP in this patient:

A) Is the best way to diagnose this syndrome
B) Is only helpful in 50% of the cases
C) Is contraindicated because of the risk of contamination of the CSF
D) Is only useful in immunocompromised patients
E) Should be performed to aid in diagnosis while you are waiting for the OR to be prepared
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Question 4

• Epidural abscess
  – Neuroimaging (MRI)
  – Surgical emergency
  – Broad spectrum antibiotics
  – LP contraindicated (obtain specimen in OR)
Question 5

- A 31 yo F develops acute right sided hemiparesis and altered mental status after a few weeks of mild confusion. She has not had any recent illnesses. She is admitted to the hospital and an MRI is performed. Subsequent brain biopsy suggests demyelinating lesions. She dies 3 weeks after admission.

Question 5

- A 31 yo F develops acute right sided hemiparesis and altered mental status after a few weeks of mild confusion. She has not had any recent illnesses. She is admitted to the hospital and an MRI is performed. Subsequent brain biopsy suggests demyelinating lesions. She dies 3 weeks after admission.

- Question: Which of the following is likely true in this patient:
  A) An LP would have a very high likelihood of demonstrating oligoclonal bands
  B) This woman probably eats a lot of undercooked pork
  C) Plasmapheresis and corticosteroids are contraindicated
  D) The patient requires reverse isolation
  E) This disease has a very high fatality rate
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Question 5

• **Fulminate (Marburg's Variant) Multiple Sclerosis (MS)**
  – Rapid; few months
  – Oligoclonal bands, but not as common as in MS
  – Plaques can be confused with tumors (enhance, edema)
  – Steroids, plasmapheresis, mitoxantrone
Question 6

- 24 yo M. Pt. has a h/o IVDA. Presents with 1 week of stiff neck and difficulty opening mouth. Over the last 24 hours he has has episodes last 30 seconds to 1 minute where he feels like he is choking and unable to breath.

- He has had a 10lb weight loss over the last week 2° to difficulty eating.

- On exam he is a cachectic man who appears agitated, irritable and very sensitive to stimuli.

- Soon after admission he becomes intermittently and then continuously stridorous. He develops respiratory failure and requires intubation.
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• **Question:** In this patient, appropriate treatment includes:
  
  **A)** non-depolarizing agent for intubation, metronidazole, immunoglobulin and high doses of benzodiazapines
  
  **B)** avoidance of paralytic agents, high doses of narcotics and intravenous corticosteroids.
  
  **C)** Intubation and then lorazepam 0.1 mg/kg and phenytoin 20mg/kg
  
  **D)** Bag-valve mask ventilation and Naloxone
  
  **E)** Intubation and observation
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Question 6

- **Tetanus**
  - *Clostridium tetani*
  - Diagnosis primarily clinical.
  - trismus, muscle rigidity, stimulus-induced tetany, and a history of a wound or injury within the last 3 weeks is highly suggestive.
  - Treatment with Tetanus immunoglobulin (HTIG), metronidazole, muscle relaxants (benzos, baclofen, NM blockde) and ICU care.
Question 7

• 18 yo F with recent DPT vaccine booster develops headache, N/V and malaise over the last 3 days. 24hr prior to admission she develops a tetraparesis and dysphagia.

• The patient is admitted to the ICU and quickly intubated for airway protection.

• The patient is afebrile. Sedated and on a ventilator


• Lumbar puncture demonstrates **300 WBC (90% lymphs), 0 RBC, Pr.=88 mg/dl, Gl.=75mg/dl, +MBP, +OCB**
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**Question:** The long-term prognosis of this patient:

A) Very rarely includes a sequellae of M.S.
B) would be worse if she was a young child
C) may be improved with the administration of high dose i.v. corticosteroids
D) Includes a mortality of up to 85%
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- **Acute Disseminated Encephalomyelitis (ADEM)**
  - 1-3 days after infection or vaccination
  - White matter in brainstem and subcortical structures
  - Adults worse prognosis than children
  - High dose steroids
41yo M with no PMH. Presents with 3-4 days of increasing confusion and decreasing level of consciousness. Brought to the ED by his wife who states he has been talking nonsense.

- Temp 39.3°C, tachycardic and tachypnic
- Aphasic, R weakness. Stuporous.
- Serum WBC=19 (90% lymphs)
- LP: WBC=777 (90% lymphs), RBC=226 (+xanthachromia), Pr.=66mg/dl, Gl=88mg/dl
Question 8

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**Question:** Which of the following is true regarding this patient:

A) Immunocompromised patients have an increased risk for developing this disease
B) This disease typically involves the deep grey structures in the brain (basal ganglia)
C) The treatment may result in reversible renal failure
D) It is the most common cause of viral encephalitis in the US
E) Seizures are uncommon in this disease
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Question 8

- Herpes encephalitis
  - Only affects cortical structures
  - Usually HSV1. Not clear if primary or reactivation
  - Cortical syndromes. 2/3 with seizures.
  - Lymphocytic pleocytosis, mildly elevated protein. + PCR
  - Acyclovir. 10 mg/kg q 8h. Hydrate well to prevent renal failure
A 56 yo F with SAH develops hydrocephalus and requires an External Ventricular Drain (EVD).

Question: Which of the following is true:

A) Antibiotic coated catheters have been demonstrated to reduce the risk of infection.
B) The patient’s SAH puts her at low risk for EVD infection.
C) Systemic prophylaxis with antibiotics has never been demonstrated to prevent EVD infections.
D) The parameters to clearly define an EVD infection have been well defined in the literature.
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Question 10

- 67 yo M with alcoholism brought to ED after being found unconscious. Head CT demonstrates small acute SDH. Awakens in ED and admitted to floor for observation.

- On admission serum $\text{Na}^+$ is 118 mEq/L. Patient is given 1.8% NaCl for hydration. The next morning he again has altered level of consciousness. $\text{Na}^+$ is now 141 mEq/L. Sent to ICU.
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• Question: With regard to this syndrome:

A) The serum sodium should be corrected at a rate of no more than 1-2 mEq/L per day

B) This disease process has a uniformly grim prognosis

C) High dose corticosteroids have proven safe and effective in this disorder

D) Other patient populations at risk for this disease include patients with liver failure, hyperemesis gravidarum and those with severe burns.

E) To prevent this syndrome in a patient with acute hyponatremia and seizures, treatment should be high dose benzodiazepines and correction of serum Na⁺ slowly over at least 48 hours.
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Question 10

- Central Pontine (and extra pontine) myelinolysis: CPM
- Na+ rise 8-12 mEq/L per 24h
- Supportive care for CPM
That’s It!

- Good Luck with your exam!