



Found Down

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Resident

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**CONTRA COSTA REGIONAL MEDICAL
CENTER
NOON CONFERENCE SERIES**

DISCLOSURE OF CONFLICT OF INTEREST

- Speaker has nothing to disclose



Objectives

- Reintroduce Internal Medicine M&M to the CCRMC Community
- Discuss aim and format of M&M
- Case Discussion
 - Be aware of signs of meningitis
 - Evidence for CT before LP
 - Discuss use of dexamethasone



QuickTime™ and a
decompressor
are needed to see this picture.
QuickTime™ and a
decompressor

Ernest Amory Codman & “The End Result Cards”



Morbidity & Mortality

- Impetus
 - Initiated and led by residents
- Modern approach
 - Punitive to constructive
 - Individual error to broad domains of care
 - Interdisciplinary, collaborative approach
- ACGME Core competencies as framework

Kravet et al. Morbidity and Mortality Conference, Grand Rounds, and the ACGME's Core Competencies. JGIM 2006; 21: 1192-1194



Core Competencies

■ ACGME Core Competencies

- 1) Patient Care
- 2) Medical Knowledge
- 3) Practice-based Learning and Improvement
- 4) Interpersonal and Communication Skills
- 5) Professionalism
- 6) Systems-based Practice



Case

- 57 y/o male brought in by paramedics after neighbors found him in his apartment moaning.
- Found with white powder in a bag by him when paramedics arrived.
- Brought in to the ER, and immediately intubated as for Glasgow coma score of 10 – unable to protect airway.

Initial Studies

39.5 14.9 361
 42.6

| | | |
|-----|----|-----|
| 134 | 95 | 10 |
| 3.8 | 21 | 1.4 |

126

~~0.8~~
~~78~~ ~~22~~
~~76~~

TP: 7.8 Alb: 3.1

- CRP – 25.37
- Lactate – 8.0
- U/A – sm bili/mod bld/30 prot/ tr LE/6-10 wbc/6-10 rbc/bacteria few
- CK – 2645
- Random troponin – 0.05
- Urine toxicology – positive for amphetamines, benzodiazepines, opiates
- CT head – reported as negative



Physical Exam

- VS: T-99.9, BP-102/49, P-133, RR-31, POx-97% 100% NRB
- General: no spontaneous eye opening, withdrawing to pain, making nonsensical moaning/noises
- HEENT: nc/at, left pupil reactive but sluggish; unable to visualize right pupil 2/2 scarring, mm dry
- Cardiac: tachycardic, no m/g/r
- Resp: coarse bs bilaterally, no wheezes
- Neuro: GCS 10, no meaningful response, moaning, right sided contractures
- Abdomen: hypoactive bs
- Extremities: cool peripherally, mottled skin



ER Course

- Intubated in ER
- Given Zosyn 3.375 gm and Vancomycin 1 gm IV for possible sepsis
- CT of head ordered (done as leaving ER)
 - Presumptive diagnosis of stroke
- Plain film – no infiltrate
- EKG – sinus tachycardia, no ST-T wave abnormalities



Additional Medical History

- History CVA with right sided hemiparesis
 - Thought to be traumatic
- Oropharyngeal SCC – s/p resection and radiation therapy
- Hepatitis C
- Chronic Prostatitis
- H/o Meth and alcohol abuse
- Gastritis



Clinical Signs & Symptoms of Acute Meningitis

- Classic Triad
 - fever
 - AMS
 - nuchal rigidity

- Kernig/Brudzinski Signs



Meningitis: Physical Exam

The Data

Review article of 10 studies to examine accuracy and precision of clinical exam findings in ABM

- Classic triad has 46% pooled sensitivity, but 99% of patients with meningitis had one of three
- Kernig/Brudzinski- poorly studied
- Jolt accentuation of headache

Attia et al. Does this adult patient have acute meningitis? JAMA, 1999;282: 175-181



Meningitis: Physical Exam

The Data

Absence of fever, AMS and nuchal rigidity effectively rules out meningitis, however, many of the signs and symptoms of meningitis have been inadequately studied to affectively rule in or rule out meningitis making LP necessary in any but the lowest risk patients



Hospital Course

- Neurologic:
 - CT of head reported as negative by Nighthawk Radiology
 - Decision to LP made in am on HD # 1



CT before LP

- Prospective study of 301 adults with suspected meningitis
- Abnormal CT associated with:
 - Age >60
 - Immunocompromise
 - History CNS disease
 - Seizure w/in one week
 - AMS or Focal neuro deficit

Hashun et al. Computed tomography of the head before lumbar puncture in adults with suspected meningitis. NEJM 2001;345:1727-33

Roffe, AR. Lumbar puncture and brain herniation in acute bacterial meningitis: a review. J Intensive Care Med 2007;22:194-207



Neurologic

- Lumbar puncture done for sepsis of unclear etiology in setting of AMS.
 - >3000 WBC, 90% PMN
 - Glucose 4, Protein approximately 500
 - Ceftriaxone, Vancomycin and Ampicillin as well as acyclovir were started for coverage of bacterial and potentially viral meningitis
- Subsequently developed agitated breathing afternoon of day one, started on propofol to help control breathing



Neurologic

- Repeat CT of Head, Hospital day number 2



Herniation

- Given dramatic changes on CT, was given
 - Mannitol (started ~14:30 7/23/10)
 - Decadron (started ~12:00 7/23/10)
 - Hyperventilated



Dexamethasone in Meningitis

- Randomized, double-blind trial in 301 patients from Europe with bacterial meningitis
- All patients had suspected meningitis in combination with findings on CSF analysis

de Gans et al. Dexamethasone in adults with bacterial meningitis. N Engl J Med. 2002;347(20):1549-56.



Dexamethasone (cont'd)

- Dexamethasone significantly reduced both
 - mortality (7 versus 15 percent with placebo)
 - all unfavorable outcomes (15 versus 25 percent).

- When looking at outcome based on **cultures**, dexamethasone ONLY had a benefit in those with *S. Pneumoniae*
 - Mortality of 14% versus 34%
 - All unfavorable outcomes 26% versus 52%



Unbefriended

- Patient without family
- Friends
 - Neighbor
 - Previous caregiver
- Meeting held with friends



Outcome

- Ultimately declared brain dead – care withdrawn and underwent cardiac arrest



Issues

- Should meningitic doses of antibiotics been started sooner?
- Would starting mannitol, decadron and hyperventilating the patient have helped prevent herniation?
- What is the role of dexamethasone in bacterial meningitis?
- Did the lumbar puncture contribute or accelerate the brain herniation?
- Can stroke look like bacterial meningitis on CSF examination?



Resources for Residents and Staff

- Medical Errors and Adverse Outcome Committee (MEAO)
- Nursing Debriefing
- Other ?



References

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