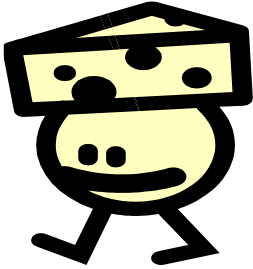


Who Moved My Cheese?



CELP Seminar
January 27th, 2020
Jeff Schapiro, M.D.

1

CASE

81 y/o woman with a medical history significant for cerebrovascular disease, COPD, hyperlipidemia, hypertension, hypothyroidism and breast cancer, presents with **delirium**. She is uncooperative and combative.

2

CASE

14d PTA the patient was treated with Zithromax and **Prednisone** for a COPD exacerbation. This was her 3rd steroid course in the past 5 months.

4 days PTA she is noted to have a **headache and diarrhea with worsening confusion and odd behavior**. The headache is only partially relieved by vicodin.

3

CASE

Medications at presentation:

Lovastatin	Albuterol
Synthroid	Atrovent
Lasix	Theophylline
Spironolactone	Naproxen
Amitriptyline	Vicodin
Buspirone	

4

CASE

She received the latest flu vaccine, and was up to date on tetanus and diphtheria immunization. She had not received Pneumococcal vaccination

5

CASE

Differential Diagnosis

- Clostridium difficile colitis with hypovolemia
- Adrenal insufficiency
- Pulmonary embolism
- Myocardial infarction
- Meningitis

6

CASE

EXAM

T=100.7

BP 164/85 P 125 (sinus tach)

R 31 O₂Sat 95% on 100% NRB

No abnormal findings on physical exam

Intubated due to respiratory failure

7

CASE

LABS

WBC 13 85% neutrophils Hct 43

BUN/Cr 12/1.0 Na 138 K 3.8

Serum CO₂ 39 Anion gap 7

ABG 7.37/51/127/98% on 100%NRB

LFTs normal UA NEGATIVE

Theophylline level 4.5 TSH 1.5

BNP 87 Troponin 0.01 D-dimer <45

8

CASE

Admission CXR

- No infiltrates or pulmonary edema.



9

CASE

Differential Diagnosis

- Clostridium difficile colitis with hypovolemia
- Adrenal insufficiency
- Pulmonary embolism
- Myocardial infarction
- Meningitis

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Meningitis – CT before LP?

- Immunocompromised state
 - HIV, immunosuppressed, post-transplant
- History of CNS disease (mass, stroke)
- Seizure within the previous week
- Reduced level of consciousness
- Focal motor or cranial abnormalities
- Papilledema

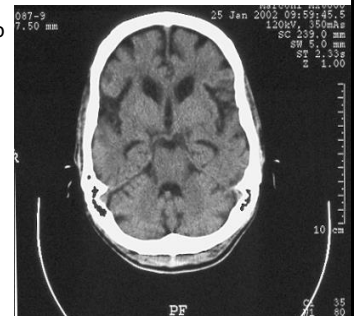
NEJM 345:1727, 2001
AIM 159:2681, 1999

11

CASE

Admission HEAD CT w/o contrast

- diffuse cerebral atrophy
- age-related ischemic change
- no hemorrhage, mass effect or fluid collection.



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Meningitis

What are the Causes?

- Viral: Herpes

OR

- Bacterial

WBC 100-1000: Viral or Bacterial	Glu 10-45 mg/dl: Bacterial (< 60% of serum Glucose)
Pro: 50-500 mg/dl: Viral >500 mg/dl: Bacterial	(rarely viral)

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CASE

CSF Profile

- Slightly cloudy, colorless
- Gram Stain – Many WBC, no organisms
- RBC 93
- VDRL – NON REACTIVE
- HSV PCR – NEGATIVE
- VZV PCR – NEGATIVE
- ENTEROVIRUS PCR - NEGATIVE

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CASE

CSF Profile

- WBC 585
- 4%PMN 18%L 70%Monos
- Pro 307
- Glu 37 (serum 87)



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Meningitis – Signs and Symptoms

- Sudden onset of fever, intense headache, nausea and vomiting, stiff neck, and mental status changes such as:
 - Change in consciousness
 - Unusual behavior
 - Excessive sleepiness
 - Seizures
 - Over sensitivity to light

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Meningitis – Signs and Symptoms

- Classic Triad of fever, neck stiffness, altered mental status is low.
- Almost all patients present with 2 of 4 symptoms:
 - Fever
 - Headache
 - Neck stiffness
 - Altered mental status

NEJM 351:1849, 2004

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Meningitis

The
“DO...RE...MIs”




18


Meningitis



"DO"



"RE"



"MI"

Treatment

1. Lumbar Puncture
2. Steroids
3. Antibiotics

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Meningitis – Use of Steroids

Give steroids BEFORE antibiotics

- Decreases the TNF rise that follows bacterial death, helping to prevent cerebral edema

Clinical outcomes most improved for:

- Pneumococcal meningitis
- Recommended by IDSA for all bacterial meningitis due to low side effect profile and reduction in hearing loss and neurologic sequelae.

No adverse effects associated with steroid therapy were found

- Cochrane Database Syst Rev 2010 Sept 8, IDSA Guidelines: Clin Infect Dis 39(9) 2004
 - N Engl J Med 2002 Nov 14;347(20):

20

Meningitis Use of Antibiotics

- Ceftriaxone 2gm q12h
 - pneumococcus, meningococcus, H. flu, Group B strep, GNRS
- Vancomycin 1gm IV q12h
 - (Ceftriaxone resistant Pneumococcus <5% of isolates)

+

- Ampicillin 2gm q4h
 - (risk factors, age > 50)
 - Listeria

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Meningitis

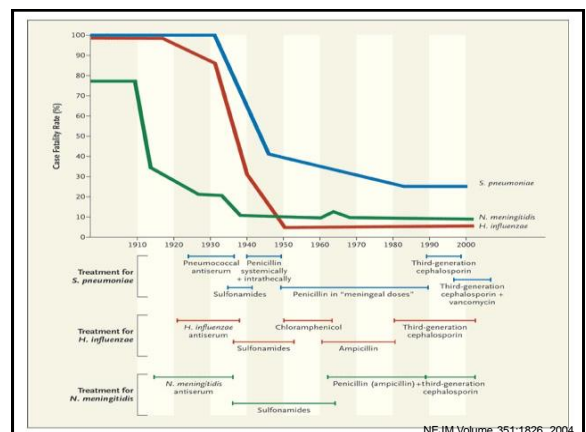
- Leading causes of meningitis today
 - Pneumococcus – 50%
 - Meningococcus – 25%
 - Listeria – 10%
 - Group B Strep – 10%
 - H. influenzae type b – 10%

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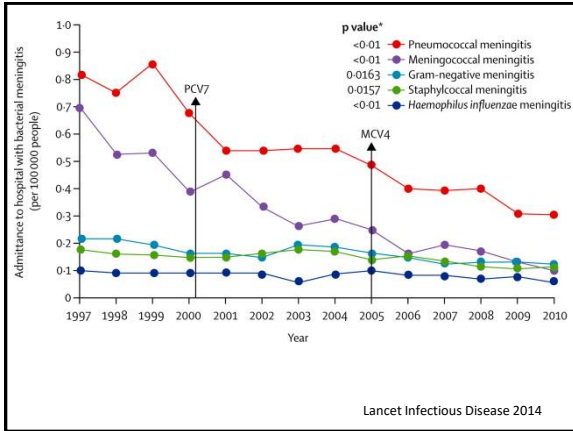
Meningitis

- Mortality rates
 - H. influenzae type b - <5%
 - Meningococcal – 10%
 - Group B Strep – 10%
 - Pneumococcal – 20-30%
 - Listerial – 25%

23



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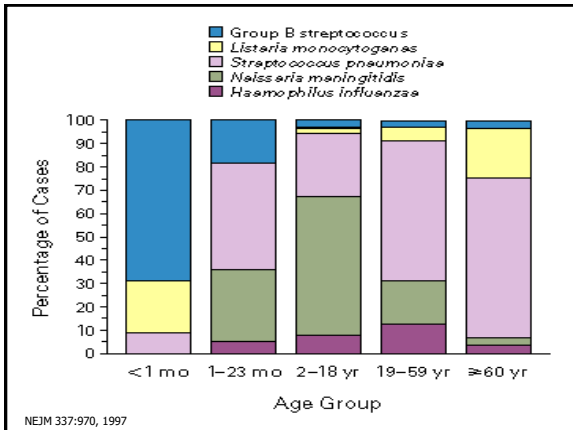


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Meningitis

One Size Does Not Fit All

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And Now...The Rest Of The Story

The results of the LP prompted further inquiries into the patient's history.

Questioning of the patient's husband revealed that in the week prior to her illness she ate **SOFT MEXICAN CHEESE**

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Listeria monocytogenes Facts

- CSF pleocytosis
 - 33% monocytes predominate
 - 67% neutrophils are predominant
- Gram stain of CSF often negative
- Can be confused with other Gram-positive pathogens, such as diphtheroids.

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Listeria Meningococcus Pneumococcus

30

Listeria Epidemiology

- Disease is rare but organism is common in the environment
- Disease associated with consumption of food
- Disease associated with risk factors
- ~2000 cases reported/year
- Mortality rate about 25%

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Listeria Epidemiology

Carriers

- Healthy people
- Pregnant women
- Food handlers
- Hemodialysis patients
- Slaughterhouse workers

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Listeria – Risk Factors

- Pregnant women
- Diabetics
- Elderly
- Immunosuppressed
 - Steroid use
 - Transplant recipients
 - HIV/AIDS
- The healthy can become infected but rarely get seriously ill

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Listeria - Manifestations

- Diarrhea, nausea, vomiting may occur prior to onset of illness
- Low-grade flu-like infection
- Meningitis
- Encephalitis
- Septicemia

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Listeria – CNS Disease

- Higher incidence <3 y/o or >50 y/o
- Fever, altered sensorium, headache most common symptoms
- Many have no meningeal signs
- Gram stain often negative
- CSF WBC, protein lower than other bacterial causes of meningitis

Medicine 77:313, 1998

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Listeria – CNS Disease

Treatment

- Ampicillin +/- Gentamicin
- Trimethoprim/Sulfa
- ?Vancomycin
- ??Quinolones

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Foods Associated with Listeriosis

Cheese	
Fish	
Raw Milk	
Turkey franks	Deli salads
Smoked fish	Hot dogs
Deli meat	Human breast milk
Ice cream	Mushrooms
Chicken nuggets	Sausages

Infectious Dose

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Foods Associated with Listeriosis

- Milk products
- Cheeses: Feta, Camembert, Bleu, soft Mexican cheeses (unpasteurized milk)
- Meat and poultry:
 - ready-to-eat products
 - Unheated/undercooked hot dogs, chicken
- Seafood: fresh frozen, processed

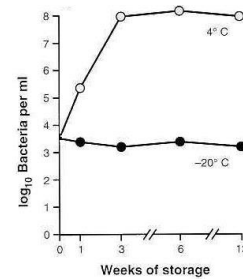
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Listeria - Prevention

- Avoid raw or partially cooked food of animal origin
- Avoid cross-contamination between raw and cooked foods during preparation
- Reheat leftovers until too hot to touch
- Avoid soft cheeses (cottage cheese, cream cheese are OK), **unless they are made from pasteurized milk**
- Raw vegetables should be washed before eating

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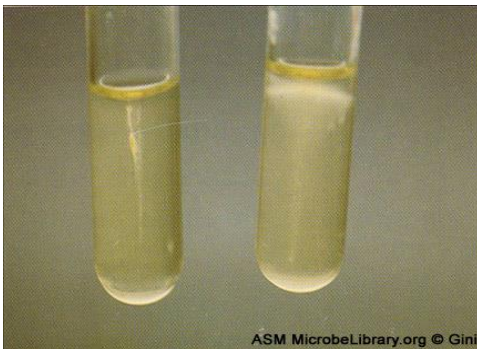
Listeria – Risk Factors



Today's Online Textbook of Bacteriology

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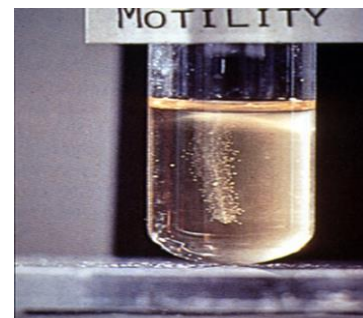
Tumbling motility



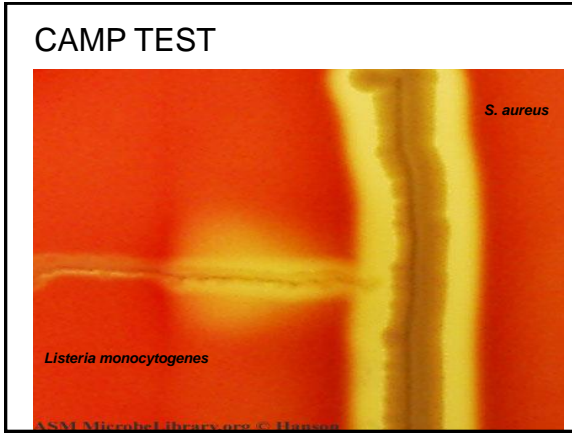
ASM MicroLibrary.org © Gini

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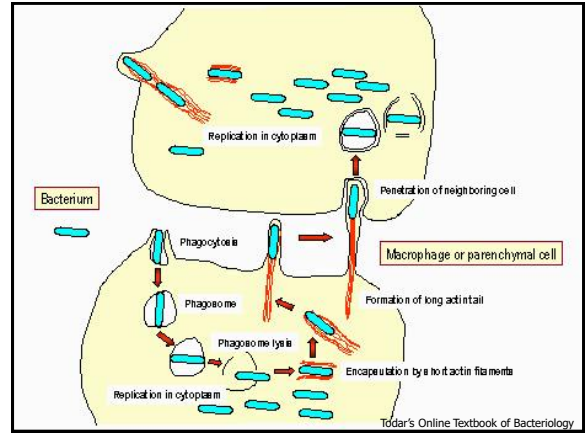
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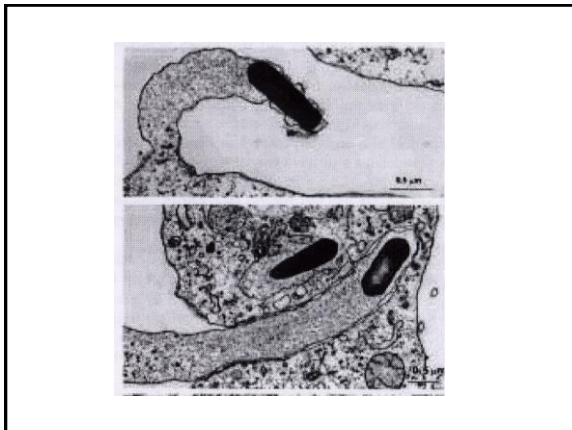
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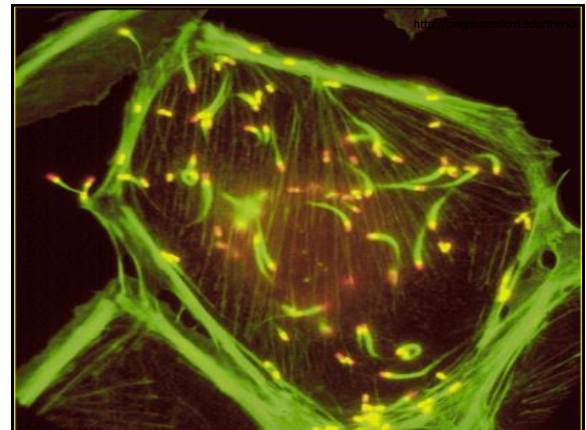
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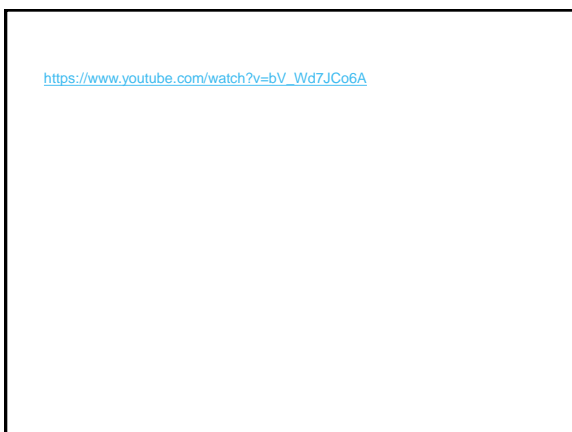
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