Case Studies in Infectious Diseases
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Case Presentation

- 55 y/o woman with a past hx of kidney stones presents to Urgent Care c/o upper mid-back pain and pain in the left shoulder for 2 days. No history of trauma. On PE she is afebrile with normal vital signs and TTP over the left posterior shoulder.
- She is treated symptomatically and sent home

The following day, as instructed, she calls her PCP who orders thoracic and lumbar spine films —> degenerative disc disease;
- CBC —> WBCs 14.6 (4-11) with 90% PMNs (40-80)
- ESR —> 48 (0-15)

Told to go back to Urgent Care b/o elevated WBCs. She c/o pain in the upper back that has been getting progressively worse. Her Temp is 100.6°F and on exam there is tenderness in the thoracic paraspinous area
- WBC—> 14.5
- UA—> 10-20 WBCs/HPF; 0-2 RBCs; 1+ bacteria
- ABD CT—> bilateral renal calculi and no hydronephrosis
Your next step?

1. Analgesics and fluids for renal calculi
2. Analgesics for musculoskeletal pain
3. Nitrofurantoin for a UTI
4. MRI spine

Case Presentation

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Fever and Back Pain

- Pyelonephritis w/wo stone and obstruction
- Pancreatitis
- Cholecystitis
- PID
- Endocarditis
- Osteomyelitis/Discitis
- Epidural abscess
Take Home Point

- Fever and back pain is an epidural abscess until proven otherwise***
- Best diagnostic test is an MRI with contrast

***

BUT ONLY ≈ 50% OF PATIENTS WITH AN EPIDURAL ABSCESS HAVE FEVER ON PRESENTATION

Role of ESR/CRP in Diagnosis

- If there is back pain and a predisposing condition to SEA (DM, IVDU, coexisting infection, recent back surgery, indwelling catheter, immunocompromised)
  
  Obtain an ESR/CRP

  If elevated —> obtain MRI (sensitivity 98% Specificity 70%)

Case Presentation

- A 62 y/o man with HTN, hyperlipidemia and CAD presents with new onset of headache. He notes that over the last 2-3 weeks he has not been feeling well with intermittent low-grade fevers and decreased appetite. On PE he is afebrile with a BP of 118/65 and a P of 98. He has a 2/6 SEM at RUS boarder (old) but an otherwise normal exam.
  
  A diagnosis of sinusitis is made —> Augmentin for 7 days
Case Presentation

- He presents 2 weeks later to the ED with a visual field defect. An CT is done and he is found to have a (R) posterior communicating artery infarct. He notes that initially he felt better on the antibiotics, but when stopped he developed low grade fevers again.
- CBC -> 14.3 with a normal diff; Hct = 32
- ESR -> 77

At this point you would??

1. MRI of the Brain
2. CT of the sinuses
3. Do a temporal artery BX
4. Obtain BCs

Blood Cultures– Gram negative rods

Case Presentation

- HACEK organisms
- Haemophilus aphrophilus
- Actinobacillus actinomycetemcomitans (Aggregatibacter actinomycetemcomitans)
- Cardiobacterium hominis
- Eikenella corrodens
- Kingella kingae
Take Home Points

- A prolonged fever is NOT a viral syndrome or a self-limited bacterial infection
- Anyone with a prolonged fever should have blood cultures drawn
- "A central nervous system event, especially in a young, otherwise healthy individual, is endocarditis until proven otherwise"

Case Presentation

- 20 year old previously healthy male
- Day 1
  - Onset of sore throat with fever
- Day 2
  - Evaluated in office—exudative pharyngitis with tender anterior cervical adenopathy, h/o fever and no cough (4/4 of Centor Criteria)
  - Azithromycin started (within 24 hours of onset of symptoms)

Diagnosis of Gp A Streptococcal Pharyngitis

- IDSA (Infectious Disease Society of America)
- Rapid strep test
- ACP (American College of Physicians) and the AAFP (American Academy of Family Practice)
- Modified Centor Criteria

Modified Centor Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Absence of cough</td>
<td>1</td>
</tr>
<tr>
<td>Swollen and tender anterior cervical nodes</td>
<td>1</td>
</tr>
<tr>
<td>Temperature &gt; 100.4°F (38°C)</td>
<td>1</td>
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<tr>
<td>Tonsillar exudates or swelling</td>
<td>1</td>
</tr>
<tr>
<td>Age</td>
<td></td>
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<tr>
<td>3 to 14 years</td>
<td>1</td>
</tr>
<tr>
<td>15 to 44 years</td>
<td>0</td>
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<tr>
<td>45 years and older</td>
<td>-1</td>
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Cumulative score: __________

Score ≥4→ Rx empirically
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Case Presentation
- Day 3
  - PC—not better—still with sore throat and fever
  - Plan—continue azithromycin
- Day 5
  - Phone Call—not better
    - Diffuse myalgias, difficulty swallowing, pain on (R) side of neck
  - Plan—to finish Azithromycin; encourage fluids; ibuprofen for symptom relief; call if not better

Case Presentation
- Day 6
  - PC-SOB and pleuritic chest pain
  - Instructed to go to ED for evaluation

Case Presentation
- ED evaluation
  - WBC—21,400 with 51% PMNs and 42% bands
  - Plts—16,000
  - BUN 80, Cr 4.2
  - PTT 50; FDP elevated
  - pH 7.29 with elevated lactic acid
  - CXR, chest CT and BCs obtained
Case Presentation—CXR

Case Presentation—Chest CT

Fusobacterium necrophorum

What Went Wrong?

- Natural History of GpA Streptococcal Pharyngitis
  - w/o therapy, symptoms better in 3-5 days
  - With early therapy (24 hours) symptoms resolve 24-36 hours sooner
- Viral Pharyngitis
  - Similar time line
Fusobacterium necrophorum

- Anaerobic gram-negative rod
- An important upper respiratory pathogen in ADOLESCENTS AND YOUNG ADULTS (ages 15-25)
- Can isolate F. necrophorum from 10% with sore throat (equal in frequency to gp A streptococcus)
- Peritonsillar abscesses—F. necrophorum isolated in 23% (most in pure culture) c/w gp A streptococcus—17%

Complication—LEMIERRE'S SYNDROME
- Septic phlebitis IJ vein, bacteremia,
- Septic pulmonary emboli/abscess
- Estimated to occur in 1 of 400 cases of F. necrophorum pharyngitis (more common than Rheumatic Fever following gp A streptococcal pharyngitis)

Pharyngitis in Adolescents

- Fusobacterium necrophorum
- Resistant to macrolides (azithromycin/clarithromycin)
- Sensitive to penicillins, cephalosporins and clindamycin

Take Home Points

- Pharyngitis in the adolescent and young adults (ages 15-25) can be more complicated than previously thought
- Encourage Rapid Strep Testing
  - Antibiotic stewardship
  - Treat only if positive
Take Home Points

If you use the Centor Criteria:

- AVOID MACROLIDES for empirical therapy in pharyngitis in adolescents and young adults
- *F. necrophorum* is resistant to macrolides
- AND there is increasing resistance of Gp A strep to macrolides
- Penicillin, cephalosporins, clindamycin, Augmentin® are reasonable choices
- Remember the natural history:
  - If the patient fails to improve think about complications like Lemierre’s

CASE PRESENTATION

- A 45 year old man awoke the day prior to presentation with a sore throat. Throughout the day the sore throat worsened, and he had difficulty eating dinner because of pain. The next morning he awoke with an even worse sore throat and an elevated temperature of 103.5˚ F. In the office he complained of a severe sore throat, his temperature was 98˚ F and his pharynx had mild erythema without exudate.

What would you do at this point?

1. Rapid strep test
2. Antibiotics without testing
3. Observe without antibiotics (send home)
4. Send to ENT
5. Order head/neck CT
**SORE THROAT DIAGNOSIS NOT TO MISS**

- Epiglottitis
- Para and retropharyngeal abscess
- Diphtheria
- Foreign Body
- HIV
- Lemierre's Syndrome

**When To Suspect Epiglottitis**

- “Worst sore throat of my life”
- With minimal findings on exam
- Hoarse/muffled voice
- Severe odynophagia

**Adult Epiglottitis**

- Increasing incidence in adults (decreasing in children due to Hib vaccination)
- Adults –more indolent (days v hours) and less toxic appearing
- Dx made by direct visualization-fiberoptic laryngoscope less likely to provoke spasm than mirror exam
- Bacteriology-H. influenzae/parainfluenzae, S. pneumoniae, Gp A strep
- Abx-3rd generation cephalosporin
- Intubation not required as it is children

**Case**

- The dentist of your 45 year old female patient with MVP and moderate mitral regurgitation calls wanting to know if she needs antibiotic prophylaxis for a root canal and which one.
Should prophylaxis be given?

1. Yes
2. No

Prophylaxis for Endocarditis

- "New" AHA Guidelines from 2007
- Updated from 1997
- Transient bacteremia occurs in up to 50% of individuals as a result of normal daily activities
- Endocarditis is much more likely to occur from frequent bacteremias associated with daily activities than from bacteremias caused by dental, GI or GU procedures.

Procedures for Which Endocarditis Prophylaxis is Recommended

- Dental procedures that involve manipulation of gingival tissue, periapical region of the tooth or perforation of oral mucosa
- Respiratory tract procedures with incision or biopsy
  - Tonsillectomy/adenoidectomy
  - Bronchoscopy with biopsy
  - Drainage of empyema/lung abscess
- Infected skin, skin structure, muscle
- NO PROPHYLAXIS for any GI or GU procedures

Conditions for Which Endocarditis Prophylaxis is Recommended

- Prosthetic cardiac valve or prosthetic material used for cardiac valve repair
- Previous endocarditis
- Congenital heart disease
  - Unrepaired
  - Repaired, but residual defects
  - Completely repaired, first 6 mo post-procedure
- Cardiac transplant with valvulopathy
- NO OTHER CONDITIONS
Case

- The dentist of your 65 year old patient who is 9 months s/p total hip arthroplasty calls wanting to know if prophylaxis should be given for a root canal

Should Prophylaxis Be Given?

1. Yes
2. No

Dental Prophylaxis for Prosthetic Joints

- Area of controversy for years between the ADA, AAOS and IDSA
- Promise of collaboration with joint guidelines
- Good News/Bad News
  - Within last month recommendations have been published (ADA/AAOS)
Dental Prophylaxis for Prosthetic Joints

BAD NEWS—> Grade of Recommendation is Limited:
The practitioner might consider discontinuing the practice of routinely prescribing prophylactic antibiotics for patients with hip and knee prosthetic joint implants undergoing dental procedures.

Implications: Practitioners should be cautious in deciding whether to follow a recommendation classified as Limited.

What TO DO??

- Disconnect between organisms causing PJIs (vast majority are Staph spp) and mouth flora (streptococci)
- Bacteremias common as a result of everyday activities
- Best study cited in the recommendations:
  - Clin Infect Dis 2010;50:8–16

Dental Procedures as Risk Factors for Prosthetic Hip or Knee Infection: A Hospital-Based Prospective Case-Control Study

- Prospective case control study comparing patients with PJI to patients randomly admitted to orthopedic floor
- Dental records obtained and reviewed by DDS
- Variables were high and low risk procedures and whether the patient received antibiotic prophylaxis
Conclusions

- Dental procedures do NOT increase risk of PJI
- Antibiotic prophylaxis does NOT decrease the risk of PJI infection

What TO DO??

- Prophylaxis NOT indicated for pins, plates, fixation devices, THA or TKA regardless of when the implant was placed
- Consider the consequences of infection in certain populations and GIVE PROPHYLAXIS:
  - Previous PJI, Hemophilia, IDDM
  - Immunocompromised
    - Inflammatory arthropathies (RA, SLE)
    - Immunosuppressive medications

Case

- A 35 yo woman is being evaluated for a 6 month h/o fatigue, arthalgias without arthritis and memory loss manifest as word-finding difficulties and forgetfulness. The workup has been thorough but frustrating for both you and the patient because answers have not been forthcoming. Finally, after an exhaustive internet search, she requests that Lyme disease serologies be performed. You reluctantly agree.

Case

- Serologies
  - CDC recommends 2-stage testing
    - Screening ELISA—very sensitive but not specific
      - If negative—>no further testing
      - If positive—>confirmatory test
    - Confirmatory Western Blot
      - IgM—can take several weeks to become positive
      - IgG—positive after the IgM
**Case**

- Serologies return:
  - ELISA screening test is equivocal
  - Confirmatory Western Blot is IgM (+) and IgG (-)

**Your Next Step Is**

1. Start doxycycline
2. Put in a PICC line and start ceftriaxone
3. Repeat serologies
4. Refer to ID
5. Curse the day you ordered the test

**Lyme Disease**

- Caused by spirochete *Borrelia burgdorferi*
- Transmitted by Ixodes tick
- Diagnosis made clinically in early stages (erythema migrans) and serologically in late stages
- Serologies have not been standardized
  - Most commercial labs reliable
  - "Notorious" laboratories

**Erythema Migrans**
Lyme Disease

- Caused by spirochete Borrelia burgdorferi
- Transmitted by Ixodes tick
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Clues to Diagnosis

- EM occurs 3-30 days after bite—most commonly in 7-10 days
- Early reactions that fade are due to the tick bite and are not EM
- Ticks must feed 24-36 hours to transmit organism
- Know prevalence in your area
  - East Coast 60-70% infected
  - West Coast ≤ 5% infected

Clinical Manifestations

Two Views:

“Lyme Literate” Physicians (ILADS)

Conventional Teaching

- Arthritis NOT arthralgias
  - Large, weight-bearing joints
- Carditis
  - 2nd and 3rd degree block
- Nervous System
  - Early-7th nerve palsy, lymphocytic meningitis, mononeuritis multiplex
  - Late-peripheral stocking glove neuropathy, encephalopathy-abnormalities in cognitive function and memory
Diagnosis of Late Manifestations
(Steere AC et al. Clin Infect Dis 2008;47:188)

- Sensitivity of 2-tier testing in late Lyme disease is 100% and specificity is 99%
- “Therefore, current thinking is that all patients with objective neurologic, cardiac, or joint abnormalities associated with Lyme disease have serologic responses to B. burgdorferi”

Back To The Patient

- Fatigue
- Arthralgias NOT arthritis
- Cognitive impairment
- 10 panel members practicing in highly endemic areas “have diagnosed only 7 patients over the past 5 years” (IDSA guidelines Clin Infect Dis 2006;43:1089)
- Serologies negative for IgG

Case Presentation

A 22 yr old comes to the office complaining of the acute onset of unilateral weakness of the right side of his face. Your diagnosis is Bell’s Palsy.

What is Your Therapy

1. Prednisolone
2. Acyclovir
3. Prednisolone + acyclovir
4. Nothing
Etiology of Facial Nerve Palsy

- 50% are idiopathic (Bell's Palsy)
- Herpes Simplex/Varicella Zoster
- Lyme disease (most common cause of bilateral FN palsy)
- Diabetes
- Sarcoid
- Trauma
- Tumors
- Other infections
  - CMV, EBV, HIV

Therapy of Bell’s Palsy

- Quite controversial
- Because of the association with herpes viruses the use of acyclovir has been felt to be beneficial
- Two well done prospective, randomized, controlled, blinded studies have been done

Therapy of Bell’s Palsy

- 839 patients enrolled within 72 hours of onset of symptoms
  - Placebo + placebo (206)
  - Prednisolone (60mg X 5 days then reduced by 10 mg/day) + placebo (210)
  - Valacyclovir (1000mg TID X 7 Days) + placebo (207)
  - Valacyclovir X7 Days + prednisolone X10 Days (206)
Placebo

Valacyclovir + placebo

Prednisolone + placebo

Prednisolone + valacyclovir

Therapy of Bell’s Palsy

- Case closed on therapy?? NO!!
- Other less powered studies and subgroup analysis suggest acyclovir might be beneficial in the most severe cases
  - minimal or no movement of facial muscles and inability to close the eye

Take Home Points

- Early treatment (within 72 hours of onset) recommended
- For most cases prednisolone for 10 days is adequate
- For severe cases (complete or near complete paralysis) prednisolone for 10 days + valacyclovir for 7 days is recommended