CASE PRESENTATION

• A 45 year old man awoke the day prior to admission 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 a fever of 103.5° F. In the ED his temperature was 98° F, 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

When To Suspect Epiglottitis

• “Worst sore throat of my life”
  – With minimal findings on exam
  – Hoarse/muffled voice
  – Severe odynophagia
Adult Epiglottitis

• Adults --more indolent (days v hours) and less toxic appearing
• Dx made by direct laryngoscopy
• Bacteriology--H. influenzae/parinfluenzae, S. pneumoniae, Gp A strep
• Abx--3rd generation cephalosporin
• Intubation not required as it is children
• Steroids of no benefit

Case Presentation

• A 32 year old sexually active woman presents with the acute onset of dysuria, urgency and frequency.

Questions

• What is the differential diagnosis?
• Assuming a UTI, what is the etiologic agent?
• Should cultures be done? If so, what is “significant bacteriuria”?
• What is the “drug of choice”?
• What is the optimal duration of therapy?

UTI -- Signs/Symptoms

• Cystitis  
  – Dysuria  
  – Urgency  
  – Frequency  
  – Suprapubic pain  
  – Suprapubic tenderness
  
• Pyelonephritis  
  – Fevers  
  – Chills  
  – Flank pain

Etiology of UTI

• OUTPATIENT  
  – E. col – 75-90%  
  – Staphylococcus saprophyticus – 5-15%, mainly in younger women  
  – Klebsiella, Proteus, Enterococcus
• NOSOCOMIAL  
  – E. col, Klebsiella, Proteus, Enterococcus  
  – Pseudomonas, Citrobacter, Enterobacter
• OTHER  
  – Mycoplasma hominis, Ureaplasma urealyticum--??

UTI--Signs/Symptoms

• Signs/Symptoms not specific for UTI  
  – Cystitis/pyelonephritis  
  – Vaginitis-candida, trichomonas, bacterial vaginosis  
  – STds-herpes, chlamydia, gonorrhea
• Combinations of Sxs very suggestive  
  – Dysuria and frequency without vaginal discharge or irritation = 90% probability of cystitis

Case Presentation

• A 32 year old sexually active woman presents with the acute onset of dysuria, urgency and frequency.
Should cultures be done?

1. YES
2. NO

What is significant bacteriuria?

1. $10^2$ organisms/ml
2. $10^3$ organisms/ml
3. $10^5$ organisms/ml

What is the drug of choice for therapy of UTIs?

1. Ampicillin/Amoxicillin
2. Keflex
3. TMP-SMX (Bactrim/Septra)
4. Ciprofloxacin
5. Nitrofurantoin

Susceptibility of E. coli Urinary Isolates

- The Surveillance Network (TSN) -- Over 250 clinical microbiology laboratories in US
- 350,000 - 416,000 isolates tested:
  - TMP-SMX -- 17.5% resistance
  - Ampicillin -- 38% resistance
  - Nitrofurantoin -- 0.8% resistance
  - Ciprofloxacin -- 2.3% resistance

Susceptibilities of Urinary Isolates

- Resistance to TMP-SMX is increasing
  - In some areas, resistance as high as 20%-25%--know your #s
  - Resistance is over estimated
    - Only culture failures
    - Inpatient cultures
- Some (IDSA) have recommended alternate therapy if resistance > 10%-20%
Should TMP-SMX be Used Empirically?

- Controversial
- Reasonable if:
  - Not allergic
  - Not treated in the last 3 months
  - Prevalence of resistance less than <20%
- HOWEVER
  - Natural history is 50% cure even with resistant strains

Other Antibiotics for UTI

- Nitrofurantoin
  - Very active against E.coli (>95%)
  - Less active against other GNR’s and no activity against pseudomonas and proteus
  - High levels in the urine, but no tissue penetration
  - Short T1/2 and should be given 7 days instead of 3 days

Other Antibiotics for UTI

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  - Short T1/2 and should be given 7 days instead of 3 days

ANTIBIOTICS FOR THERAPY OF UTIs

- Fluoroquinolones--ciprofloxacin, levofloxacin, ofloxacin, gatifloxacin
  - Active against most enteric gram-negatives and S. saprophyticus
  - Achieves high urine and tissue levels
  - Can be given for 3 days
  - Concern--development of resistance
- NOT MOXIFLOXACIN

Duration of Therapy for UTI’s

- Three days for uncomplicated UTI in otherwise healthy, non-pregnant woman
- TMP-SMX/FQ = 3 days; Nitrofurantoin = 7 days
- Older women, those with S. saprophyticus infx and those with Sx’s for >6 days should receive 7 days of Rx
- Diabetes, pregnancy, immunocompromise, early recurrence after short course therapy, men -- should not receive short course therapy

UTI in Men

- Etiology more varied than in women. E. coli most common, but Senata, Klebsiella, Pseudomonas and enterococcus also frequent
- Because of variability, culture indicated
- Significant bacteriuria is 10^3/ml
- Ciprofloxacin reasonable empirically, but base on culture (but NOT nitrofurantoin)
- Often associated with prostatic focus – a minimum of 7 days and many recommend 10-14 days
CASE PRESENTATION

• A 38 y/o woman with known MVP presented with 2 wks of fever and malaise. 4/4 BC’s were positive for viridans streptococci. Treatment with IV PCN resulted in defervescence in 4 days. One week later she developed fevers to 101˚F.
• PE - murmur unchanged, no splenomegally or evidence of emboli

CASE (cont)

• Workup
  – BC’s - negative
  – UA - no hematuria
  – CXR and EKG - normal
  – ECHO - unchanged
  – WBC’s - 10,600 with normal differential
  – Indium scan - negative
• Transferred to UCSF cardiothoracic surgery for valve replacement

What would you do at this point?

1. Stop antibiotics and re-culture
2. Add low dose gentamicin for synergy
3. Change antibiotics to Ceftriaxone
4. Change antibiotics to vancomycin
5. Proceed with surgery as she has clearly failed therapy

CASE (cont)

• Penicillin was changed to vancomycin
  and the patient became afebrile in 24 hours

CHARACTERISTICS OF DRUG FEVER

• No specific fever pattern - continuous (10%), remittent (26%), intermittent (21%), hectic (14%)
• Relative bradycardia in only 11%
• Leukocytosis (>10,000) in 22%
• Eosinophilia in 22%
• Rash in 18%
• Previous history of drug fever in 11%
• Lag period for antimicrobials - 6 days

Case Presentation

• A 66 year old woman with chronic LE edema secondary to CHF presents with the acute onset of a red, warm swollen and tender left foot. Erythema and tenderness extend to the mid-tibial area.
What is the most likely etiology?

1. S. aureus
2. Gp A strep
3. E. coli
4. Mixed-staph, strep, gnr's, anaerobes
**Etiology of Cellulitis**

- **Outpatient** — Usually caused by Strep. pyogenes (Gp A strep), less commonly by S. aureus and rarely by other strep (Gp B,C,G)
- **Nosocomial** — may include gram-neg organisms (E.coli, klebs, pseudomonas, enterobacter) as well as staph (including MRSA) and strep
- **Decubitus/Diabetic/Vascular Ulcers** — polymicrobial including staph, strep, enterococcus, enteric gram-negatives, pseudomonas, anaerobes
- **Animal Bites** — Pasteurella multocida (< 24hours); staph, strep, “mouth” anaerobes later
- **Human Bites** — aerobic and anaerobic mouth flora as well as Eikenella corrodens

**Therapy of Cellulitis**

- **Outpatient**
  - 1st generation cephalosporin (Keflex®), penicillinase-resistant penicillin (dicloxacillin) or amoxicillin-clavulanic acid (Augmentin®)
  - Clindamycin for penicillin allergic patient
- **Significant resistance of S. aureus to macrolides (erythro) and azalides (azithro/clarithro)**
- **Duration of therapy**
  - Standard 7-14days
  - Recent data suggests 5 days as good as 10 days
- **Nosocomial**
  - Vancomycin/ add a 3rd (ceftriaxone) or 4th generation (cefeprime) cephalosporin if don’t respond

**Case Presentation**

- A 35 year old woman with mild asthma and 3 young children, all of whom have had URIs, had rhinorrhea and nasal congestion 10 days prior to presentation. Early in the course she used Afrin® for symptomatic relief. She initially improved, but for the last 3 days she has clinically worsened with headache, nasal congestion and purulent nasal secretions.

**The most likely diagnosis is?**

1. Another viral infection
2. Bacterial sinusitis
3. Allergic sinusitis
4. Rhinitis medicamentosa

**Acute Bacterial Rhinosinusitis (ABRS) --Pathophysiology**

- ABRS is a pyogenic complication of a viral URI; estimated that 0.2-2% of all viral URIs are complicated by ABRS
- Viral URI —→ mucociliary dysfunction —→ bacteria from nasopharynx colonize sinuses —→ bacterial invasion
**Time line**

- It takes about 7 days for bacterial invasion and symptoms to develop—**PATIENTS WITH SYMPTOMS FOR LESS THAN 7 DAYS DO NOT HAVE SINUSITIS AND DO NOT NEED ANTIBIOTICS**
- Most viral URI’s are improving or gone by day 7
- Typical scenario
  - URI—>improves—>then worsens
  - OR URI fails to improve/worsens in 7 days

**Clinical Diagnosis of ABRS**

- Multiple studies correlating signs and symptoms with ABRS, all limited by imperfect diagnostic criteria
- Best correlates
  - Purulent nasal discharge
  - Maxillary tooth or facial pain (esp if unilateral)
  - Unilateral maxillary sinus tenderness
  - Worsening of Sxs after initial improvement

**Without antibiotics, how many patients are well at 2 weeks?**

1. 10%
2. 25%
3. 33%
4. 50%
5. 66%

**How Beneficial are Antibiotics for Therapy?**

- Several randomized, double-blind trials that compare antibiotics to placebo and two meta-analyses
- Antibiotics are statistically more effective than placebo in decreasing/eliminating Sxs, but the effect small
  - 81% of treated and 66% of placebo responded at 10-14 days — an absolute benefit of 15%

**Bacterial Etiology of ABRS**

- **S pneumoniae** — 30-35%
  - Concern: intermed and high level resistance to PCN
- **H influenzae** — 15-25%
  - Concern: 30% β-lactamase (+)
- **Moraxella catarrhalis** — 5-10% (children)
  - Concern: almost all β-lactamase (+)
- Other — S aureus, anaerobes, GNRs, gp A strep
For the patient presented, what is the drug of choice?

1. Ciprofloxacin
2. Levofloxacin
3. Ampicillin
4. Telithromycin
5. Azithromycin

What is Appropriate Antibiotic Therapy?

- Cochrane Review of 49 randomized trials
  - 10 trials comparing penicillin/amoxicillin to non-penicillin (cephalosporins/macrolides)
  - 16 trials comparing non-penicillin regimens to amoxicillin-clavulanate (Augmentin®)
- CONCLUSION—CURRENT EVIDENCE SUPPORTS USE OF AMOXICILLIN

What is Appropriate Antibiotic Therapy?

- Antibiotic naïve in last 4-6 weeks:
  - Amoxicillin 40 mg/kg/d--1 gm TID
  - Augmentin XR 2gm BID
- Recent antibiotics
  - Fluoroquinilone--levofloxacin, moxifloxacin

Duration of Therapy

- Data inconclusive and most recommend therapy for 7-10 days
- One study with amoxicillin-clavulanate (Augmentin®) suggested 10 days was superior to 5 days
- A recent study comparing 3 and 6 day regimens of azithromycin to 10 days of Augmentin® showed equivalence
- Telithromycin--clinical and microbiologic (sinus punctures) cure 90% with 5 or 10 days of Rx

CASE

- A 42 yr old man with a previous h/o migraines presents with 2 weeks of low grade fever and diffuse myalgias. He calls to make an appointment because of sudden onset of headache.

CASE (cont)

- PE--T 101.2°F, no sinus tenderness, Gr I-II/VI SEM LSB (old), diffuse muscle tenderness, no focal neurologic findings.
At this point you would??

1. Rx symptomatically for a viral syndrome
2. Azithromycin
3. Get BCs
4. CT and lumbar puncture
5. Rx for migraine

CASE (cont)

- A prolonged fever is NOT "viral syndrome"
- Any one with a prolonged fever should get BCs
- 40% of patients with SBE present with myalgias and LBP as a prominent complaint

ID “Dictum”

- "A central nervous system event, especially in a young, otherwise healthy individual, is endocarditis until proven otherwise"

CASE PRESENTATION

- A 52 year old diabetic with a long history of LBP, presents with acute and severe worsening of pain 2 weeks after straining her back. She says she “feels warm” but has no thermometer at home. On exam, limited motion due to pain, her Temp is 100.6°F, there is no CVA or spinal tenderness. A UA has 5 WBCs/HPF

Your next step?

1. Analgesics and bedrest–observe
2. Abd US
3. CT spine
4. MRI spine
5. Echocardiogram
FEVER AND BACK PAIN

• Pyelonephritis w/wo stone and obstruction
• PID
• Endocarditis
• Osteomyelitis/Discitis
• Epidural abscess

FEVER AND BACK PAIN

Epidural Abscess:
• Classic “4 stages”: focal pain—>radicular pain—>motor weakness/sensory deficit—>paralysis
• MRI best diagnostic test

ID “Dictum” #2

• Fever and back pain is an epidural abscess until proven otherwise

CASE STUDIES IN INFECTIOUS DISEASES

Richard A. Jacobs. M.D.,PhD

Case Presentation

• A 34 y.o. grade school teacher comes in with acute onset of sore throat over 2 days and low grade fevers to 100.8°F. He denies cough.
• PE: T 99.2°F, no adenopathy and a throat exam that looks like
Your Diagnosis is??

1. Streptococcal pharyngitis
2. Parapharyngeal abscess
3. "Viral" infection
4. Diphtheria

Etiology of Acute Pharyngitis

- **Bacterial** — 5-15% gpA strep
  - Gp C and G strep, gonococcus, Arcanobacterium hemolyticum, C diphtheriae, mycoplasma, chlamydia
- **Viral**
  - Rhinovirus, coronavirus, adenovirus, influenza, parainfluenza, HSV, EBV, CMV, HIV
- **Other**
  - Para/retropharyngeal abscess, epiglottitis, foreign body, Ludwig’s angina, thyroiditis, gastroesophageal reflux

How best to diagnose streptococcal pharyngitis

- Clinical
- Rapid strep tests
- Culture

Predictors of GABHS Pharyngitis

- **The Centor criteria**
  - Tonsillar exudate
  - Tender anterior cervical adenopathy
  - Absence of cough
  - History of fever

Diagnosis of GABHS

- **Culture**
  - Gold Standard
  - Sensitivity of 90%-95%
- **Rapid Antigen Test**
  - Sensitivity of 80%-90%
  - Specificity of > 95%
  - More expensive than culture
- **Centor criteria**
  - If 3 criteria present—32% with (+) culture
  - If 4 criteria present—56% with (+) culture

Recommendations

- **Centor criteria** useful if zero or one criteria present—low likelihood of disease—> no diagnostic tests or therapy needed
- If disease suspected on clinical (2,3 or 4 Centor criteria) or epidemiologic grounds, confirm by either culture or rapid antigen test and base therapy on results
Therapy of GABHS

- Penicillin V 250 mg tid or qid; 500 mg bid for 10 days
- Benzathine penicillin G 1.2 million units X 1
- Erythromycin 500 mg bid or macrolide for 10 days
- Recurrent GABHS pharyngitis -- clindamycin or amoxicillin-clavulanate for 10 days or benzathine penicillin G X 1 dose

Case Presentation

- A 45 year old woman presents with dysuria, urgency and frequency. She has had 3 previous UTI's in the last 4 months

Questions

- Does she need a urologic work up?
- What strategies are available to prevent recurrent infections?

Antibiotic Therapy for Recurrent UTI

- Prophylactic antibiotics
  - TMP-SMX—1/2 SS tab nightly or SS 3X/week
  - TMP — 100 mg nightly
  - Nitrofurantoin — 50-100mg nightly
  - Initiate if 2 infx/6mos or 3 infx/yr and cont X 6 mos
- Intermittent self-administration of antibiotics
  - (Gupta K et al Ann Int Med 2001;135:9)
- Postcoital antibiotics

Postcoital Antibiotic Prophylaxis for Recurrent UTI

(Stapleton A et al JAMA 1990;264:703)

- Prospective, randomized, controlled study of women with recurrent UTI's, not necessarily related to sexual intercourse
- Placebo v TMP-SMX (1/2 SS tab) within 2 hours of intercourse
- 2/16 in TMP-SMX (0.3 infx/pt-yr) v 9/11 in placebo gp (3.6 infx/pt-yr) developed infection. P = 0.0001

Non-antimicrobial Regimens to Prevent Recurrent UTI

- Intravaginal estriol
  - (Raz R and Stamm WE N Engl J Med 1993;329;753)
- Regular bladder emptying
- Abstention from sexual intercourse
- Cranberry juice
- Discontinuation of diaphragm use
Cranberry Juice and UTIs
(Di Martino et al. World J. Urol 2006;Jan 6:1)

• Anti-adherent properties NOT acidification
  – E coli fimbria produce 2 adhesins--mannose sensitive and mannose resistant
  – All fruit juices contain fructose--inhibits mannose-sensitive adhesins
  – Only Vaccinium berries (cranberry and blueberry) contain a unique high molecular weight polymer (proanthocyanidin) that strongly inhibits mannose resistant adhesins

A dozen clinical trials
– Small numbers
– Different preparations--juice, cocktail, capsules
– Different dosing regimens
• BUT, results encouraging and suggest possible clinical benefit in preventing UTIs

Asymptomatic Bacteriuria
(Clin Infect Dis 2005,40:643-IDSA Guidelines)

• Definition
  – Women-10^5 organisms in 2 specimens
  – Men-10^5 organisms in a single specimen

• Pyuria
  – Presence or absence of pyuria does NOT influence to treat asymptomatic bacteriuria

• Screening
  – Only if associated with poor outcomes and treatment prevents these outcomes
  – DO NOT ADVOCATE ROUTINE SCREENING

ELDERLY with asymptomatic bacteriuria?

1. TREAT
2. DON’T TREAT

PREGNANT WOMEN with asymptomatic bacteriuria?

1. TREAT
2. DON’T TREAT

Elderly

• Asymptomatic bacteriuria is common, transient and not associated with increased morbidity or mortality

DON’T TREAT
PREGNANT WOMEN
• 20-30 fold increase risk of pyelo
• Increase premature delivery
• Increase low birth weight infants
SCREEN AND TREAT

DIABETIC WOMEN with asymptomatic bacteriuria?

1. TREAT
2. DON’T TREAT

DIABETIC WOMEN
• Treatment did not decrease symptomatic UTIs, pyelo or progression of nephropathy
DON’T SCREEN OR TREAT

PREMENOPAUSAL, NONPREGNANT WOMAN with asymptomatic bacteriuria?

1. TREAT
2. DON’T TREAT

PREMENOPAUSAL, NONPREGNANT WOMEN
• No increase in mortality, chronic renal insufficiency or hypertension
• 8% risk of developing symptomatic UTI—As UTI is easily treatable, felt not worth treating 12 patients to prevent one infection
DON’T SCREEN OR TREAT

UROLOGIC INTERVENTIONS and asymptomatic bacteriuria?

1. TREAT
2. DON’T TREAT
UROLOGIC INTERVENTIONS

• Urologic procedures with mucosal bleeding associated with increased bacteremia and sepsis

SCREEN AND TREAT

Note: changing a Foley is low risk and does NOT require screening/treatment

ORGAN TRANSPLANT RECIPIENTS

• Insufficient data on screening and treatment, but most would treat, especially in renal transplant recipients

Case Presentation

• A 25 y.o. previously healthy farm worker sustained trauma to his penis 2 days prior to admission. He presented to a local ED where he was found to have a small necrotic area on his penis that progressed while he was in the ED. He was given a dose of ceftriaxone and transferred to UCSF.

What is your diagnosis?

1. Clostridial myonecrosis
2. Necrotizing fasciitis
3. Fournier’s gangrene
4. Synergistic necrotizing cellulitis
5. Who cares?—it doesn’t matter
Differential Diagnosis of Deep Tissue Infections

- Progressive Bacterial Synergistic Gangrene
- Synergistic Necrotizing Cellulitis
- Gas Gangrene
- Necrotizing Cutaneous Mucormycosis
- Anaerobic Cellulitis
- Fournier's Gangrene

- Incubation Period
- Onset (gradual/acute)
- Pain/Swelling
- Exudate (Thin/Thick/Dark/SS/Purulent/Seropurulent/Dishwater)
- Gas
- Odor (Sour/Sweet)

DEEP TISSUE INFECTIONS

- Consider polymicrobial
- Broad spectrum antibiotics
  - Vancomycin + flagyl + tobramycin
  - Flagyl + 3rd generation cephalosporin
  - β-lactam + β-lactamase inhibitor + tobramycin
  - Carbapenem
- Surgery

WHEN TO SUSPECT DEEP TISSUE INFECTION

- High risk patient -- diabetes, trauma, surgery
- Wound necrosis
- Gas
- Exudate (foul smelling)
- Systemic symptoms/signs out of proportion to local findings
- Anesthesia of involved area

Case Presentation

- A 56 year old diabetic presents with an ulcer on the metatarsal-phalangeal area of the plantar aspect of the foot. There is surrounding cellulitis with a necrotic base to the ulcer, but no purulent material can be expressed and bone is not showing. He has no F/C.
Diabetic Foot Infections

- Mild -- ulceration with surrounding cellulitis
- Severe (life or limb threatening) -- involvement of deep structures with systemic symptoms
- REMEMBER
  - F/C/leukocytosis may be absent in diabetics with severe infx
  - High index of suspicion
  - Hyperglycemia may be only clue
  - Careful exam

Questions

- What is the likely bacteriology?
- What would appropriate therapy be?
- What is the best way to diagnose osteomyelitis?

Outcomes of Therapy - Diabetic Foot Infections

<table>
<thead>
<tr>
<th>Wound Healing</th>
<th>Clindamycin (n=25)</th>
<th>Cephalexin (n=27)</th>
<th>Total (n=52)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healed</td>
<td>10 (40%)</td>
<td>9 (33%)</td>
<td>19 (37%)</td>
</tr>
<tr>
<td>Improved</td>
<td>14 (56%)</td>
<td>18 (67%)</td>
<td>32 (62%)</td>
</tr>
<tr>
<td>Unimproved</td>
<td>1 (4%)</td>
<td>0 (0%)</td>
<td>1 (2%)</td>
</tr>
</tbody>
</table>

"The Diabetic Foot"
Outpatient diagnosis of osteomyelitis

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probe to bone test</td>
<td>66%</td>
<td>85%</td>
</tr>
<tr>
<td>Tc Bone scan</td>
<td>68-100%</td>
<td>18-79%</td>
</tr>
<tr>
<td>Indium WBC scan</td>
<td>80-100%</td>
<td>70-90%</td>
</tr>
<tr>
<td>MRI</td>
<td>98%</td>
<td>89%</td>
</tr>
</tbody>
</table>

Gold Standard is bone biopsy with culture and histology

Defining Bacteriology of Osteomyelitis in Diabetics

(Senneville E et al. Clin Infect Dis 2006;42:57)

- 81 episodes of osteomyelitis, off abx at least 4 wks
  - Pathogens in bone Bx found in swab only 30% of time
  - Concordance in 17%
    - S. aureus–42.8%
    - Gram-negative bacilli–28.5%
    - Streptococci–22.5%

Case Presentation

- A 35 year old man presents with a history of a URI for 7 days. Coryza and myalgias have resolved, but cough with production of moderate amounts of greenish-yellow sputum have persisted. He has not had fever and on exam, his lungs are clear.
Acute Bronchitis

- "Acute bronchitis is a common sequence of catching cold and is often nothing more than the extension downward of ordinary coryza...The cough is rough at first, cutting and sore...it comes on in paroxysms which rack and distress the patient extremely...At first the cough is dry but in a few days the secretions become muco-purulent and abundant, and finally purulent...In healthy adults, by the end of a week, the fever subsides and the cough loosens. In another week or ten days convalescence is fully established"

Natural History of Acute Bronchitis


- Cough typically persists for 10-20 days
- Purulent sputum reported in 50%
- Bronchial hyperreactivity in 40% that can last 5-6 weeks

Etiology of Acute Bronchitis

- 90% due to viruses -- influenza, parainfluenza, RSV, corona viruses, adenovirus, rhinovirus, human metapneumovirus
- 5-10% due to bacteria -- B pertussis, C pneumoniae, M pneumoniae
  - C. pneumoniae and M. pneumoniae more common in adults with chronic or persistent cough: present late in course with wheezing
  - Treatment does not change outcome of illness
  - B. pertussis presents late (36-48 days of cough) with cough that is often paroxysmal and disturbs sleep
- No evidence that S pneumoniae, H influenzae or M catarrhalis cause acute bronchitis

Antibiotics and Acute Bronchitis

- Reviews and meta-analysis of 9 randomized placebo-controlled trials conclude no consistent benefit of antibiotics
- Recent trial comparing azithromycin to vitamin C found no difference in illness outcome or return to work.
  - Addresses concerns that earlier studies used antibiotics without activity against atypical agents implicated in acute bronchitis

Other Therapy for Acute Bronchitis

- β₂-agonist: recent Cochrane Review not well supported, even in those with airflow obstruction
- Steroids (oral/inhaled), mucolytics, antitussive agents: frequently given - not supported in the literature
Nonantibiotic Therapy of Acute Bronchitis

- Immunomodulating therapy
  - Vitamin C, zinc acetate/glucocinate, and echinacea variable results in URIs
- Extract of *Pelargonium sidoides* root looks promising
  - Used for Rx of TB and other respiratory tract infections in Europe and Mexico
  - Mechanism unclear--antibacterial and immunomodulating (increases TNF, interferon, NK killer cell activity); in vivo increases the ciliary beat frequency of respiratory epithelium

**Pelargonium sidoides for Acute Bronchitis** (Matthyse et al Phytomedicine 2003;10:Suppl 4;7-17)
- Double blind, randomized, placebo-controlled study of 468 adults with acute bronchitis within 48 hours of onset
- Measure BSS (bronchial severity score)—cough, sputum, rales/rhonchi, chest pain with cough and dyspnea
- At 7 days, BSS, duration of illness and inability to work all markedly better in treatment group
- Marketed in USA as Umcka (Nature’s Way, Springville, Utah)

**Pelargonium sidoides for non-gpA strep pharyngitis in child** (Bereznoy VV et al Altern Ther Health Med 2003;9:68)
- Randomized, placebo-controlled, double-blinded study of 143 children age 6-10
- Reduced severity of symptoms and shortened illness by 2 days

**Case presentation**
- You send the gentleman on his way with extract of *Pelargonium sidoides*, but he returns 3 weeks later with persistent cough.

**Your diagnosis is??**
1. Asthma 25%
2. Postviral bronchospasm 25%
3. Pertussis 25%
4. Gastroesophageal reflux 25%

- Catarrhal stage-(1-2 weeks)-URI Sxs
- Paroxysmal stage-(2-6 weeks)-paroxysmal cough, inspiratory "whoop", posttusive vomiting
- Convalescent stage (>2weeks)-paroxysms gradually decrease in frequency and intensity
**Pertussis**

- Difficult diagnosis to confirm
  - Culture may be (+) for first 3 weeks of cough
  - PCR may be (+) for first 4 weeks
  - After 4 weeks of cough, rely on serology
- Therapy shortens symptoms if started within 1 week of onset
- Therapy to prevent spread indicated if diagnosis made within 4 weeks
- Although organism burden low, if have contact with infants, pregnant or HC worker treat up to 8 weeks after onset

**Pertussis**

- Therapy—erythromycin (14 Days), clarithromycin (7 Days), azithromycin (5 Days)
- TMP-SMX (14 Days) for those intolerant
- Telithromycin and fluoroquinolones active in vitro, but no clinical experience

**Pertussis-Post-Exposure Prophylaxis**

- Close contacts of index case (face-to-face contact within 3 feet; share confined space for > 1 hour)
- Those at risk for severe disease—infants <12 months of age

**CASE PRESENTATION**

- A 68 y/o woman with Wegener’s Granulomatosis has been treated with high dose prednisone. She presents with 2 days of LLQ pain, fevers and chills.
- On exam, she has LLQ tenderness w/o rebound. WBC = 16,000 with 80% PMN’s and 15% bands. CT shows thickened sigmoid w/o definite abscess

**QUESTIONS**

- What is the likely bacteriology of this infection?
- Assuming the presence of β-lactamase producing anaerobes, what would be appropriate antibiotic therapy?

**ANTIBIOTICS ACTIVE AGAINST β-LACTAMASE PRODUCING ANAEROBES**

- Superb activity
  - Metronidazole (Flagyl®)
  - β-lactam + β-lactamase inhibitor (Unasyn®, Timentin®, Zosyn®, Augmentin®)
  - Carbapenems (Imipenem, Meropenem, Ertapenem)
  - Tigecycline (Tygacil®)
  - *Moxifloxacin (Avelox®)
- 50%-85% Activity
  - Clindamycin
  - Cefoxitin
- <50% Activity
  - 3rd generation cephalosporins