Infectious Disease Pearls
Joyce Sanchez, MD, FACP
49th Annual Winter Refresher Course for Family Medicine
January 30th, 2019

Learning Objectives
Describe updates in
- hepatitis C infection,
- skin/soft tissue infections,
- infectious diarrhea
- urinary tract infections, and
- sexually transmitted infections

Case 1
A 58 year old man with hepatitis C virus infection is treated with oral therapy using two direct-acting antivirals for 12 weeks. He tolerated the regimen well and his HCV viral loads at weeks 4 and 12 of therapy were undetectable. They remain undetectable 12 and 24 weeks after completion of therapy.

- CBC: platelets 110,000/mcL, otherwise normal.
- Chemistries: albumin 3.4 g/dL, alkaline phos 140 U/L, AST 60 U/L, ALT 85 U/L
- INR 1.2
- Serum alpha-fetoprotein: 8 ng/mL [<10]
- Prior to treatment, an abdominal ultrasound showed a nodular liver and splenomegaly. An upper endoscopy showed no varices. He is now seen in follow up.

Which of the following is most appropriate for this patient at this time?
A. HCV viral load testing every year for the next five years
B. Hepatic ultrasound every six months
C. Hepatic ultrasound plus serum alpha-fetoprotein every six months
D. Upper endoscopy every year
E. No further testing

No disclosures
Answer

B. Hepatic ultrasound every six months

Cured Hepatitis C and Cirrhosis

- Sustained virologic response at 12 and 24 weeks = cured of HCV
- Cirrhosis suggested by low platelets, albumin and elevated INR
- Screening for HCC recommended for patients with cured HCV and cirrhosis
- Serum AFP is not recommended due to higher false-positive rates and higher costs

Clinical Pearl

Routine hepatocellular carcinoma surveillance with hepatic ultrasound every 6 months is recommended in patients with cured hepatitis C and cirrhosis.

Case 2

A 50 year old man presents to clinic 12 hours after sustaining a bite on his hand from his pet dog while attempting to coax him into the garage while vacationing at a family lake house in northern Wisconsin. He immediately rinsed the wound with well water and placed gauze to the area. He has noticed some mild swelling and redness around the site of his bite for the past 6 hours. There is no joint pain in his hand. He is otherwise healthy and takes no medications. His dog is also healthy and up to date on rabies vaccination.

Physical examination reveals a gentleman in no acute distress. T 37 degrees C, P 85, BP 112/68. There is a 3 cm laceration on the dorsal aspect of his right hand with a 2 cm border of surrounding erythema and mild swelling. There is no fluctuance, crepitus, or synovitis.

Which of the following is the best management of this patient?

A. Trimethoprim-sulfamethoxazole
B. Amoxicillin-clavulanate
C. Clindamycin
D. Doxycycline
E. Continue wound care, no antimicrobials

Note: J. Sherman M. AASLD Practice Guidelines. Management of hepatocellular carcinoma. in update. Hepatology. DOI:0.1002/hep.20197
**Bite Wounds at Increased Risk for Infection**

- Immunocompromise
- Asplenia
- Advanced liver disease
- Preexisting or resultant edema
- Moderate-severe injuries, hand or face
- Penetration into periosteum or joint capsule

**Antimicrobial therapy for bite wounds**

- **First line:**
  - Amoxicillin-clavulanate
- **Alternative:**
  - Cephalosporins (such as cefuroxime) + clindamycin or metronidazole

**Clinical Pearl**

Preemptive antimicrobial therapy is indicated for animal bites that have a “high risk” of infection.

**Case 3**

A 42-year-old woman comes to urgent care for crampy abdominal pain, fevers, fatigue, and diarrhea for 2 days. She has been having non-bloody, watery diarrhea every 2-3 hours. She denies sick contacts and is otherwise healthy. Her LMP was 1 week ago. Her physical examination is notable for temperature of 38.2, pulse 90, BP 102/56. She has mild tenderness to palpation in both lower quadrants without rebound. Rehydration is initiated. A stool culture is obtained and positive for Shigella species.

Which of the following is the next best step in management?

A. Oral ciprofloxacin
B. Oral azithromycin
C. Oral trimethoprim-sulfamethoxazole
D. IV ceftriaxone
E. No antimicrobial is indicated

**Answer**

B. Amoxicillin-clavulanate
Community Acquired Diarrhea

Any of the Following
- Fever
- Bloody stools
- Dehydration
- Systemic illness
- Recent antibiotic use
- Day-care exposure

Supportive care

Stool culture

Shigella Treatment

› First line: Pending susceptibilities
  - Ciprofloxacin 500 mg BID x 3 days
  - Levofloxacin 500 mg daily x 3 days

› Alternatives
  - Azithromycin 500 mg orally daily x 3 days
  - Trimethoprim-sulfamethoxazole 160/800 mg BID x 5 days

Clinical Pearl

Fluoroquinolones are the antibiotic of choice for diarrhea due to shigella.

Case 3 continued

You double check the patient’s other medications as you write the prescription for Levofloxacin. Her other outpatient medications include atorvastatin, escitalopram, aspirin, pantoprazole, and calcium carbonate + vitamin D.

Which of the following should be discontinued during her antimicrobial course?

A. Atorvastatin
B. Escitalopram
C. Aspirin
D. Pantoprazole
E. Calcium carbonate + vitamin D
Fluoroquinolones

- Oral absorption inhibited by divalent cations (magnesium, calcium, aluminum-containing antacids)
- Proton-pump inhibitors and H2-receptor antagonists do not have important effects on absorption of quinolones

Clinical Pearls
Calcium-containing medications markedly reduce bioavailability of fluoroquinolones and should be held.

Case 4
A 65 year old woman presents with dysuria and urinary frequency. She is allergic to sulfa. A urine dipstick test is positive for leukocytes and nitrites. Her creatinine is 2.0.

Which antimicrobial agent is first-line for uncomplicated urinary tract treatment in this patient?
A. Trimethoprim-sulfamethoxazole
B. Cephalexin
C. Nitrofurantoin
D. Ciprofloxacin
E. Fosfomycin

Answer
E. Fosfomycin
Empiric treatment of acute uncomplicated cystitis

First-line regimens:
- Good efficacy
- Minimal “collateral” damage to normal gut microflora ($\downarrow$ antimicrobial resistance)
- Fluoroquinolones and beta-lactams have more collateral damage to the normal microflora

Uncomplicated UTI

Risks outweigh benefits for patients with:
- Uncomplicated acute sinusitis
- Acute bronchitis
- Urinary tract infections
- Due to MSK and CNS side effects

Clinical Pearl
Avoid use of fluoroquinolones when other options are available due to musculoskeletal and central nervous system side effects.

Case 5
A 24 year old male graduate student presents with 4 days of dysuria and penile discharge. He denies other symptoms. He is sexually active with women and reports 4 partners in the past 12 months. He has past medical history of urethritis due to chlamydia infection treated with one dose of oral azithromycin 1 year ago. His physical examination is notable for mucopurulent discharge at the urethral meatus.
Which of the following is the best antimicrobial regimen for this patient?
A. Levofloxacin 500 mg orally once daily for 7 days
B. Ceftriaxone 250 mg IM in a single dose
C. Azithromycin 1g orally in a single dose
D. Azithromycin 1g orally in a single dose plus Ceftriaxone 250 mg IM
E. Doxycycline 100 mg orally twice daily for seven days

Answer
D. Azithromycin 1g orally in a single dose plus Ceftriaxone 250 mg IM

Clinical Pearl
Ceftriaxone and azithromycin should be administered together on the same day for genital gonococcal infections due to increased antimicrobial resistance.

Case 6
A 68 year old man with diabetes and peripheral arterial disease presents with 4 weeks of left foot pain, redness and swelling. He has a history of a poorly healing left plantar foot ulcer. A foot x ray 3 weeks ago showed nonspecific degenerative. At that time he was prescribed cephalexin for cellulitis and acetaminophen for pain. His pain and redness mildly improved. His physical examination is notable for temperature of 37.2, BP 102/60, P 98. He has a 0.5 by 0.1 cm plantar foot ulcer with mildly erythematous borders and dusky granulation tissue. The ulcer probes to bone.

Due to concern for osteomyelitis, an MRI is performed and shows periosteal reaction of the 2nd metatarsal and phalangeal bones adjacent to his ulcer. His CBC shows a WBC of 9,900 with 72% neutrophils. His ESR is elevated at 102 mm/hr. A swab of his ulcer is sent and gram stain shows 1+ gram negative rods and rare gram positive cocci in clusters. Blood cultures are preliminarily negative.
Which of the following is the next best step in management for this patient?
A. Admit to the hospital to start IV antibiotics
B. Obtain a radiolabeled WBC scan
C. Start oral levofloxacin
D. Start oral levofloxacin and trimethoprim-sulfamethoxazole
E. Obtain a bone biopsy

Answer
E. Obtain a bone biopsy

Osteomyelitis
- Antimicrobial regimen best directed by bone biopsy
- Swab of soft tissue not reliable
- Rarely causes sepsis
- Antimicrobials best held until after tissue is obtained to improve the yield of isolating an organism

Clinical Pearl
Unless the patient is septic, antimicrobials should be held in osteomyelitis until after a bone biopsy is obtained to guide antimicrobial therapy.

Case 7
- A 35 year old otherwise healthy man presents to clinic with fever, and fluctuant area in his right axilla.
- Temperature 37.5, BP 120/60, HR 90, RR 18
- Exam: 3 x 3 cm area of fluctuance under the right axilla with mild soft tissue erythema adjacent to the area of fluctuance

What is the best next step in management?
A. Incision and drainage
B. Incision and drainage, send fluid for cultures
C. Incision and drainage, send fluid for cultures, and start oral trimethoprim-sulfamethoxazole
D. Incision and drainage, send fluid for cultures, and start IV vancomycin
**Skin Abscess Management**

- Cutaneous abscess
  - I & D only (A-II)
- Adjunctive antibiotics
  - Severe, extensive
  - Progressive
  - Systemic symptoms
  - Immunosuppression
  - Failure to respond to I&D

**Clinical Pearl**

- Abscess size ≥ 2 cm in diameter is may be a useful threshold for guiding use of antibiotic therapy for adjunctive treatment of skin abscess.

**Case 8**

A 69 year old woman with a prior history of splenectomy is admitted for decompensated heart failure and altered mental status, with no localizing symptoms for infection. Physical examination reveals a woman who is oriented to person and place. She can barely finish a full sentence. T 37.6 degrees C, P 102, BP 98/52. Her JVP is 23 cm of water. She has rales half way up both bases. Her extremities show 2+ pitting edema to the knees. A bladder catheter is placed to measure strict input and output. Over the next day she notes some bladder urgency, and a urine specimen is obtained.

- WBC is 13,000 with normal differential
- Creatine 1.9 (baseline 1.3)
- Urine microscopy: 11-20 WBC/HPF, gram stain negative, few yeast.

She diureses 4 liters over the next 2 days and her mental status improves. On hospital day 3, her urine culture grows Candida albicans.
Which of the following is the best management for this patient’s candiduria?
A. Fluconazole
B. Amphotericin B bladder irrigation
C. Remove the bladder catheter
D. Check fungal blood cultures and start caspofungin
E. No treatment necessary

Answer
C. Remove the bladder catheter

Predisposing Factors for Candiduria

<table>
<thead>
<tr>
<th>Factor</th>
<th>Risk Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract devices</td>
<td>Older age</td>
</tr>
<tr>
<td>ICU admission</td>
<td>Female sex</td>
</tr>
<tr>
<td>Prolonged hospitalization</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>Concomitant bacteriuria</td>
<td>Nephrolithiasis</td>
</tr>
<tr>
<td>Broad-spectrum antimicrobials</td>
<td>Urinary Stasis</td>
</tr>
<tr>
<td>Urinary tract instrumentation</td>
<td>Bladder dysfunction</td>
</tr>
</tbody>
</table>

Candiduria: Indications for treatment

- Asymptomatic candiduria:
  - neutropenia
  - urological procedure
- Symptomatic
  - FIRST: Manage predisposing condition (removal of the bladder catheter)

Clinical Pearl
Discontinuation of bladder catheters is the first step in managing hospitalized patients with candiduria.

Case 9
A 50 year old man is hospitalized for alcohol withdrawal. On Hospital day 1, a PICC line is placed given difficulty obtaining intravenous access. He is initiated on a benzodiazepine taper. On hospital day 5, he develops fever and dysuria. On physical examination, his temperature is 39.0, blood pressure 98/55, pulse 102. His right sided PICC line entry site is clean, dry and intact without tenderness. He has mild right sided costovertebral angle tenderness. A UA is notable for 20-50 WBC; gram stain is notable for gram positive cocci in clusters. A urine culture is positive for S. aureus and susceptibilities are pending.
What is the best next step in management?
A. Oral trimethoprim/sulfamethoxazole
B. Oral levofloxacin
C. Intravenous vancomycin, then switch to oral agent based on susceptibilities
D. Intravenous vancomycin, remove PICC, obtain blood cultures
E. No antibiotics, as this is likely a contaminant

Answer
D. Intravenous vancomycin, remove PICC, obtain blood cultures

Staphylococcal Bacteriuria
› Causes of \textit{S. aureus} in the urine:
  - \textit{S. aureus} bacteremia “from above”
  - Nidus: bladder catheter, nephrostomy tube
  - Obstructive disease of urinary tract
› Management:
  - Eliminate source (lines, lines, lines!)
  - IV Vancomycin

Clinical Pearl
Urinary tract infections with \textit{S. aureus} warrant investigation for a hematogenous source.

For Your Reference

Thank you!
Questions?
jlsanchez@mcw.edu