Infectious Disease in Oncology

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Objectives

• Discuss the significance of infection in the oncology population
• Discuss the bacterial, viral, fungal and other infectious organisms commonly found in oncology patients
• Discuss the treatment and challenges associated with infections
• Discuss drug-resistance organisms
Infectious disease

- Impact of chemotherapy and disease on the immune system

- Protective mechanisms
  - Skin
  - Natural flora
  - Immune system
  - Good Hygiene
• Possible routes for invasion into the body
  – GI tract
  – Skin lesions/wounds
  – IV access
  – GU tract
  – Surgical incisions
  – Respiratory system
• Identification of organism
  – Cultures
    • Blood, tissue, urine, sputum, wound, stool

• Blood cultures should be drawn both peripherally and from IV access (central lines)
Organisms

• Bacteria

• Virus

• Fungus
Staphylococcus aureus

• Usually skin infection

• Cultured from wounds, sputum, blood

• Treatment:
  – Vancomycin 1 gram IV q 12 hours, adjust for renal
  – Multiple choices for PO medications
Staphylococcus epidermis

- Usually from the skin

- Treatment:
  - Vancomycin 1 gram IV q 12 hours, adjust for renal
  - Cefepime 1 gram IV q 8 hours
  - Levaquin 500 mg po daily
  - Amoxicillin-clavulanate 875 mg po BID
Streptococcus Pneumoniae

Infection from skin, sputum as bacteria attaches to sinus causing pneumonia

Most common cause of bacterial meningitis

- Penicillin G 8 – 12 million units/day IV divided q 4 – 6 hours
- Levaquin 500 mg po daily x 7 days
- Cefipime 1 gram IV q 8 hours x 7 days
Gram-Negative infection  
Gram-Positive infection
Gram Negative Organism

• Escherichia coli – stool common source
  – Contamination from not washing hands
  – Most common cause of urinary tract infections in hospital settings

• Can treat with po medications such as Levaquin 500 mg po daily
Anaerobe

• **Clostridium difficile**
  • Major cause of diarrhea, colitis
  • Used to be primarily in the hospital setting, now in the community
  • Currently isolating patients for C. diff. until stool specimen comes back negative, change patient to another room and high clean patient’s old room

• Treatment
  – Flagyl 500 mg po BID for at least 10 days
  – Vancomycin 1 gram IV q 12 hours
Fungal Infections

• Candida albicans – usually oral
  – Diflucan 200 mg PO loading then 100 mg po daily uncomplicated oral candidiasis, can give up to 400 mg PO daily

• Asperilliosis – lungs
  – IV treatment with Amphotericin or Ambisome
Herpes Virus

- Herpes Simplex 1 – oral lesions, can have oral genital transmission
- Herpes Simplex 2 – genital herpes
- Human Herpes Virus 3 – Varicella Zoster, commonly called ‘chicken pox’
- Human Herpes Virus 4 – Epstein Barr Virus, ‘infectious mononucleosis’
- Human Herpes Virus 5 – Cytomegalovirus, can also cause mononucleosis
- Human Herpes Virus 6 – Roseola
- Human Herpes Virus 7 – similar to 6, can also cause Roseola
- Human Herpes Virus 8 – found in Kaposi’s Sarcoma, may also be a cause of lymphoma in patients with AIDS
Herpes

• Treat with
  – Acyclovir 800 mg po twice daily
  – Valtrex 1000mg po twice daily
  – Famvir 500 mg po three times daily for zoster

  – Treatment in neutropenic patients essential to prevent dissemination of
Cytomegalovirus

- Can present with pharyngitis, pneumonia, retinitis, encephalitis, peripheral neuropathies
- Chest x-ray: interstitial infiltrates predominately in lower lobes
- Diagnosis:
  - Biopsy with culture – can be very slow
  - Lab – elevated IgM four fold increase
Treatment

• Acyclovir 800 mg po TID x 7 days, longer if neutropenic
• Valtrex 1000 mg po BID x 7 days
• Ganciclovir IV or PO, expensive
Resistant Organisms

• Research and development problems

• Societal views on illness and therapy
  – Want a ‘pill to fix them’
  – Non-compliance with treatment regimen
  – Over use, inappropriate use

• Over-treatment, inappropriate prescribing of antibiotics for viral infections
Resistant – Gram Positive

• Methicillin-resistant Staphylococcus aureus (MRSA)
• Vancomycin resistant enterococci (VRE)
• Vancomycin resistant staphylococcus aureus (VRSA)
• Vancomycin intermediate/resistant Staphylococcus aureus (VISA)
• Penicillin (ceftriaxone) resistant Streptococcus pneumoniae

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Resistant – Gram Negative

• Pseudomonas aeruginosa
• Citrobacter

• ESBL – extended spectrum beta-lactamases
  – Escherichia coli
  – Klebsiella
Prevention

• Handwashing!!!!
• Clean water sources
• Personal hygiene
• IV access – change every 72 hours
• Emphasis in the community as well as the hospital setting for a clean environment
• Encourage good handwashing
• Encourage responsible use of antibiotics
Thank you!