Management of Infections in Intravenous Drug Users

Presented By:
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Conflict of Interest
• Dr. Polisetty has no conflicts to disclose

Objectives for Pharmacists and Pharmacy Technicians
1) Review common infectious diseases among intravenous drug users.
2) List treatment options available to treat infections among intravenous drug users.

Appropriate Terminology/Abbreviations
• PWID- Person who injects drug
• PWUD- Person who uses drugs
• Dependence
• Substance use disorder

Terminology that is not preferred in a clinical setting
• Substance abuse/misuse
• Addict/Addiction
• Drug User

Polling Question
What type of healthcare setting do you practice in?
A. Inpatient- Academic medical Center
B. Inpatient - Community Hospital
C. Emergency Room
D. Ambulatory Care Clinic
E. Community Pharmacy

Pre-Test Assessment
Which infectious disease is NOT generally associated with intravenous drug use?
A. Endocarditis
B. Skin and skin structure infections
C. Urinary tract infections
D. Hepatitis C
**Pre-Test Assessment**

What organism is NOT likely to cause skin and soft tissue infections in a patient who injects intravenous drugs?

A. *Staphylococcus sp.*  
B. *Pseudomonas Aeruginosa*  
C. *Mycoplasma*  
D. *Clostridium botulinum*

**Pre-Test Assessment – Pharmacists only**

Which of the following options can be considered for a 26-year-old patient with uncomplicated, right sided, native valve, MSSA infective endocarditis secondary to intravenous drug use?

A. Cefazolin plus gentamicin intravenously for 6 weeks  
B. Nafcillin plus gentamicin intravenously for 6 weeks  
C. Nafcillin alone intravenously for 6 weeks  
D. Ciprofloxacin plus rifampin for 2 weeks

**Infective Diseases Associated with IVDU**

- Infective Endocarditis (IE)  
  - IVDU is one of the minor Duke’s criteria for diagnosis  
  - Perivalvular abscesses  
  - Intracranial Mycotic Aneurysms (ICMAs)

- Skin and Soft Tissue Infections  
  - Staph infections.  
  - Abscesses  
  - Cellulitis  
  - Necrotizing fasciitis.  
  - Wound Botulism.

- Tetanus  
- Septic thrombophlebitis  
- Hepatitis C  
- HIV

**Risk Factors for Infections**

**Infectious risk factors**
- Poor hygiene  
- Contaminated needles  
- Sharing needles and other injecting paraphernalia such as cookers  
- Skin popping  
- Contaminated drugs

**Socioeconomic factors**
- Poor conditions (for example, on the streets or in squalid, drug den-type settings)  
- Poor nutritional status  
- Impaired immunity  
- Substance abuse disorder

**Public Health Problems Related to Intravenous Drug Use (IVDU)**

- Mortality in PWID is up to 22x higher than for the age-adjusted population.  
- The U.S. opioid epidemic has expanded and evolved from oral ingestion of prescription opioids to injection of illicitly-produced opioids such as heroin and fentanyl, and stimulants such as cocaine and methamphetamine.  
- As a result, sequelae of injection drug use including overdose have surged.  
- In 2017, fentanyl, cocaine, and meth were involved in nearly 75% of overdose deaths.
**Infective Endocarditis (IE) in Person Who Injects Drugs (PWID)**

- Proportion of IE hospitalizations from IVDU-IE increased from 7% to 12.1% between 2000 and 2013.
- Significant increase in the percentages of IVDU-IE hospitalizations among 15- to 34-year-olds (27.1%–42.0%).
- Between 1999 and 2016:
  - Greater than 55,000 deaths from endocarditis in the US
  - 10% occurred in PWID
- A referral to a program to assist in the cessation of drug use should be made for IVDUs.

**Treatment of IE in PWID**

- **Common Microorganisms**
  - *S. aureus* including community-acquired oxacillin-resistant strains
  - Coagulase-negative staphylococci
  - β-Hemolytic streptococci
  - Fungi
  - Aerobic Gram-negative bacilli, including *Pseudomonas aeruginosa*

**Treatment of IE in PWID**

- For PWIVDUs with uncomplicated* right-sided *S. aureus* IE
  - Nafcillin (for MSSA) or Vancomycin (MRSA) IV for 6 weeks
  - Addition of gentamicin to nafcillin or oxacillin has been a standard
  - But growing body of evidence shows that this may be unnecessary and may cause harm
  - Current evidence suggests that either parenteral β-lactam or daptomycin short-course therapy is adequate for uncomplicated MSSA right-sided IE.
  - For both MSSA and MRSA infections, use of adjunctive gentamicin for the treatment of *S. aureus* bacteremia or right-sided NVE is discouraged

*No evidence of renal failure, extrapulmonary metastatic infections, aortic or mitral valve involvement, meningitis, or infection by MRSA

**HIV in PWID**

- 10% new HIV cases among PWID
- 1 in 26 women/1 in 42 men who inject
- New HIV outbreaks continue to emerge

**Skin and Soft Tissue Infections In PWID**

**Treatment Algorithm**

1) Staphylococcal infections caused by MSSA and MRSA
- Abscesses: Deep seated infections requiring surgical intervention or I&D
- Cellulitis: mild to moderate superficial skin infections
- Necrotizing fasciitis: Caused by Group A Strep, requires immediate surgical intervention
- Wound Botulism: Injection site gets infected with botulinum toxin
- Drug resistant infections are on the rise

**Hepatitis C Outbreak related to Injection Drug Use**

**Where Disease Eruption Is a Threat**

- Counties vulnerable to outbreaks of HIV and hepatitis C

**Sources for Disease Eruption and Prevention**

**Where Disease Eruption Is a Threat**

- Counties vulnerable to outbreaks of HIV and hepatitis C

**Sources for Disease Eruption and Prevention**


**Njoroge et al. JAMA. 2018**

**Wurcel et al. OFID. 2016**


**CID 2014;59(2):e10-52**
HIV and Hepatitis C

- In recent years, HCV epidemic has emerged among young PWID, particularly in rural and suburban settings.
- CDC and ACIP guidelines recommend that:
  - Person who uses drugs (PWUD) should be vaccinated against hepatitis A.
  - Person who injects drugs should be vaccinated against hepatitis B.
  - People who inject drugs should be tested for hepatitis B and Hepatitis C.

HIV and Hepatitis C

- The use of contaminated injection drug equipment is a primary transmission route for both HIV and hepatitis C.
- Sharing needles, syringes, or other drug injection equipment, for example, cookers.
- Access to comprehensive prevention services is essential:
  - Syringe Service Programs (SSPs).
  - Pre exposure prophylaxis.
  - HIV diagnosis and Treatment.

Outpatient Parenteral Therapy (OPAT) Considerations

- Drug stability at room temperature.
- Frequency of drug dosing.
- Access to ancillary equipment, including ambulatory pumps.
- Insurance coverage.
- Whether the patient has a history of intravenous drug use.

Concerns with OPAT in PWID

- Lack of insurance/social support.
- Lack of IV access.
- High drug clearance due to young age.
- In patients for whom parenteral antibiotic therapy is problematic, oral treatment may be a reasonable option.
  - 2 studies have evaluated the use of oral 4-week regimens (featuring ciprofloxacin plus rifampin) for the treatment of uncomplicated right-sided MSSA IE in IVDUs.

Literature Updates

- Partial Oral versus Intravenous Antibiotic Treatment of Endocarditis.

- Oral versus Intravenous Antibiotics for Bone and Joint Infection.

Steps to reduce Infections Associated with PWID

Inpatient Hospitalization is a unique opportunity to both treat opioid use disorder and prevent the infectious and other medical complications of injection opioid use.

- Medication to combat Opioid Use Disorder- MOUD.
  - Methadone, buprenorphine (suboxone) and naltrexone (vivitrol).
  - OPAT.
- Attempt to change behavior and treat the Substance Use Disorder (SUD) in order to prevent re-admissions.

Hoffman KA, Opioid use disorder and treatment: challenges and opportunities. BMC Health Serv Res. 2019;19(1):884.
Additional Resources

Post-Test Assessment

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Post-Test Assessment

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