Infectious Complications of Injection Drug Use

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No conflicts of interest to disclose.

Learning Objectives

• Describe common acute and chronic infections associated with injection drug use and recent trends in their epidemiology
• Understand barriers to prevention and treatment of infections in people who inject drugs
• Describe the cascade of care for hepatitis C and challenges to the goal of viral elimination

What strategies have you found particularly helpful to providing comprehensive medical management to PWID?

“It sucks, nothing works, I have treated entire addicted families. Thinking of quitting. 50% of my infected inpatients today were heroin related.”

Peak HIV Deaths

Acute

Chronic

Skin/soft tissue
Sepsis/serositis
Endocarditis
Osteomyelitis
Encephalitis
Hepatitis C
Hepatitis B
HIV

Acute Serious Infections in OUD Rising

The estimated incidence of infective endocarditis in PWID is

Incidence in the general population.


Rudasill, et al. JACC 2019

Endocarditis: Marker of the Epidemic

90%
Leadership Preventive Medicine Residency

- No substance use
- Substance use by discharge diagnosis
- Substance use by composite

IE Cases by Year

Epidemic of the Young

What happens to these patients?

- Longer hospital stays
- Many leave against medical advice (AMA):
  - 4-17%
  - Difference between patients undergoing surgery vs. not

What happens to these patients?

- Longer hospital stays
- Many leave AMA
- Few go home with IV antibiotics/home health care
- Mixed data on readmissions, with caveats

IE in PWID
N=27,432
Mean Age 38.3

IE in non-PWID
N=96,344
Mean Age 50.7

Rudasill et al. JACC 2019

Mean Number of Days

IE in PWID
IE in non-PWID

Rudasill, et al. 2019


Gray et al. BMC Infect Dis 2018.

Mean Age

IE in PWID
IE in non-PWID


Gray et al. BMC Infect Dis 2018.

Mean Age

IE in PWID
IE in non-PWID

What happens to these patients?

- Longer hospital stays
- Many leave AMA
- Few go home with IV antibiotics/home health care
- Mixed data on readmissions, with caveats
- Overall mortality?

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mortality</th>
<th>Comparison to non-PWID</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIDMC^1 2004-2014</td>
<td>102</td>
<td>25.5%</td>
<td>(during study period 10yrs)</td>
</tr>
<tr>
<td>UVA^2 2006-2016</td>
<td>76</td>
<td>21.8%</td>
<td>(90d) No difference w/ non-PWID-IE cohort</td>
</tr>
<tr>
<td>DHMC 2018-2019</td>
<td>38</td>
<td>21%</td>
<td>(during study period 1y)</td>
</tr>
<tr>
<td>National Readmissions Database^3 2010-2015</td>
<td>27,432</td>
<td>6.8%</td>
<td>(not clearly defined) 9.6%</td>
</tr>
</tbody>
</table>


What about surgery?

Outcomes in PWID requiring surgery for IE

- 3-6 months after surgery, PWID were 10x more likely to die or require reoperation
- Timing coincides with time of highest risk for return to drug use after detoxification in OUD

HR 3.8 for valve-related complications
Mean age 38 ± 11

HR 6.2 for reinfection
Mean age 59 ± 14

What are we missing?
Addressing addiction: essential and missed opportunities

- No naloxone prescriptions provided
- 49% readmitted
- Of which: 28/50 (56%) had ongoing documented active injection drug use
- 7.3% of IDU-IE patients in national database readmitted within 180 days explicitly for “drug abuse”

<table>
<thead>
<tr>
<th>Table 1: Appointments and Plans for Follow-Up Treatment Documented in Discharge Summary (n = 108)</th>
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<tbody>
<tr>
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<tr>
<td>Inject IV treatment</td>
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<tr>
<td>Inpatient ED treatment</td>
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<tr>
<td>Opioid agonist therapy plan</td>
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</table>


How do we move forward?

Models for Integrating Addiction Care

Cost Considerations

- Mixed data on increased cost of DUA-related endocarditis hospitalizations vs. non-DUA related

Insurance Status of PWID Undergoing Valve Surgery for IE

- Medicare or Uninsured
- Other


Far-Reaching Implications

- 7.3% of IDU-IE patients in national database readmitted within 180 days explicitly for “drug abuse”

“Our failure to deliver comprehensive care to the IDU-IE population has potentially harmed thousands of patients while costing the health care system as much as $57 million (from 2010-2015).”
Stigma: Reduces access to care. Reduces likelihood of staying engaged in care. Influences medical decision making.

Higher acuity at time of hospitalization

Stigma?
Fear of legal repercussions?
Fear of withdrawal?

How might this really matter?

5-year survival in recurrent IE surgical therapy 91.7% vs medical therapy alone: 38.9%
"Where does one draw the line?"

"We are not obligated to endlessly supply new operations, valves, or organs if the person is a poor steward of the resources charged to his care."

"Deciding what is deserved or undeserved is a moral judgment that we, as physicians, are not in a position to make."

"A vast number of medical conditions, including heart diseases and infectious disease, may result from exposure to well-known environmental factors. Does the willingness of a patient to be exposed to those factors disqualify him from receiving indicated medical or surgical treatment?"


Michael DiMaio, MD
Tomas A. Salerno, MD

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Increased drug use linked to doubling of syphilis rate

- Between 2013-2017 syphilis incidence increased by:
  - 156% among women
  - 65.7% among men

Methamphetamines, heroin, injection drugs, sex with person who injects drugs

- Reported use of all drugs doubled during study period
- Injection drug use: 4 → 10.5%
- Use of drugs increased in men who have sex with women
- Injection drug use: 2.8% → 6.3%

Kaid RE et al. MMWR 2019.

Viral transmission of blood-borne pathogens

- Rule of “3s”
  - HBV: ~30%
  - HCV: ~3%
  - HIV: ~0.3%


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Figure 1. Contact tracing network, human immunodeficiency virus (HIV) outbreak, Scott County, Indiana, 2015. Each blue...
Wejnert, et al. MMWR 2016


- 9% of ~40,000 new HIV diagnoses in US 2016 attributed to PWID
- 13% (2,431) of AIDS diagnoses in 2016 among PWID


Implications of Opioid Misuse in HIV

- Prescribed ART
- Adherent to ART
- Virally suppressed
- Condomless sex

Ding, et al. 2005

Among HIV Patients and Providers

- Of 373 physicians, 17% agreed with at least one of:
  - “Treating IV drug users seems futile.”
  - “When given a choice, I would not treat intravenous drug users with HIV infection.”

Ding, et al. 2005
Implicit Bias

Attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner.

114% Increase in new Hepatitis B Cases in Appalachia 2006-2013

Prevalence of HCV among PWID in the US: 70-77%

HIV
EtOH
Natural History of HCV after 20 years

Treating HCV Prevents Mortality

Rapid Evolution of HCV Regimens easier to tolerate, higher SVR, all oral regimens
Prevalence of HCV among PWID in the US: 70-77%\(^1\)

Only 60-70% of patients in opioid treatment programs offered screening\(^2,3\)

Fewer patients with OUD initiate treatment than those without

Less than 10% of PWID evaluated for HCV infection initiate therapy\(^4,5\)
Treating HCV in PWID

- AASLD and IDSA guidelines do NOT consider current illicit drug use a contra-indication
- Outcomes of therapy in PWID no different than people who do not use drugs

- Meta-analysis of reinfection after interferon-based therapy in PWID
- Overall 2.4 per 100 person-years
- People reporting IDU after SVR: 6.4 per 100 person-years
- Less clear with DAAs
- C-EDGE COSTAR preliminary data: 4 per 100 person-years

Practicalities: Caring for PWID with HCV

- Multidisciplinary teams shown to have improved success
- Many advantages to co-locating opioid treatment with HCV care
  - Primary care w/treatment by primary physician and/or availability of specialist on-site or via telehealth
  - Opioid treatment programs
- DOT data limited w/DAAs but may be helpful

“Cure-As-Prevention”

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WHO Global Health Sector Strategy on Viral Hepatitis, 2016-2021

**Goals for 2030:**
- Reducing new hepatitis C infections by 80%
- Reduce deaths due to hepatitis C by 65%

How does injection drug use play in?

- Globally, estimated 2/3 of PWID infected with HCV
- 23% of global new cases
- 8% of total global disease burden
- 32% of global HCV deaths

**How? Combined Interventions Necessary**

- Blood safety and infection control measures
- Enhanced harm reduction strategies for PWID
- Antivirals for people chronically infected
- Screening

Implementing all interventions would avert 1.5 million HCV-related deaths and 15 million new infections by 2030. (Reaches mortality target by 2032)
How? Combined Interventions Necessary

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Modeling required 40% of PWID worldwide to have access to harm reduction services (syringe exchange, opioid substitution therapy).

Currently, only 1% of PWID live in nations where both of these are available

In Summary

- Injection drug use is associated with a wide range of acute and chronic infections
- Acute infections with serious consequences among PWID have risen significantly, and treatment is associated with many challenges
- HIV incidence had been decreasing until ~2012, and now at least leveling off, with concerns that opioid epidemic may lead to increases
- HCV incidence rising significantly in association with the opioid epidemic
- We will need to expand access to addiction treatment and harm reduction to reverse the trends

Questions?

“Compassion”

“Empathy”

STIGMATIZING LANGUAGE
- Opioid abuser
- IV Drug User or Abuser (IVDU/IVDA)
- Dirty (referring to test results)
- Clean (referring to recovery)

NONSTIGMATIZING LANGUAGE
- Person with substance use disorder
- Person who injects drugs (PWID)
- Urine tested positive for ___
- In recovery