Opioids, Hepatitis C Virus Infection, and the Missing Vaccine

See also Zibbell et al., p. 175.

Hepatitis C virus (HCV) is the leading infectious disease killer in the United States, causing more deaths than all 60 other infectious diseases that the Centers for Disease Control and Prevention (CDC) track, combined. The CDC continues to document increases in new HCV infections in the United States despite lacking a comprehensive national hepatitis surveillance program. In this issue, Zibbell et al. (p. 175) present 10 years of data from the National Notifiable Diseases Surveillance System showing a 133% increase in reported acute cases of HCV—more than doubling over this period. They also show that the proportion of infections attributed to injection drug use (IDU) has increased: from 75% in 2011 to 84% in 2014. Using data from the Treatment Episode Data Set-Admissions (TEDS) system, the article also examines trends over the same 10-year period in the percentage of admissions to substance use treatment facilities that report IDU by drug type. The report adds an important ecological perspective to the growing and confluent HCV and opioid epidemics. Each of these epidemics—HCV and opioid use—has been separately characterized as a public health threat, but together they have created the equivalent of a "perfect storm," resulting in a public health crisis of unusual magnitude. We discuss here the bad and good news regarding this perfect storm and the need for additional response.

SUBSTANCE USE TREATMENT

Increases in TEDS-reported admissions to substance use treatment facilities that were attributed to opioid injection is on the whole good news—but it is coupled with bad news. The number and client mix of TEDS admissions represent neither the total national demand for substance use treatment nor the prevalence of substance use disorders in the general population. The Substance Abuse and Mental Health Services Administration reports that among the 21.7 million Americans estimated to have a substance use disorder in 2015, only 11% received treatment (bit.ly/2mPrRGl). As the authors note, the medical and social consequences of opioid use as a public health threat are multiple, all with profound economic impacts. Moreover, the threat of HIV is not trivial: prescription opioid sales, opioid overdose deaths, and HCV are harbingers for incident HIV.[1]

Additional good news is that evidence for, and access to, effective treatment of opioid use disorders may be increasing, although this may not be reflected by TEDS data. TEDS data underestimate the number of people who are getting treatment and do not differentiate between facilities that offer only behavioral treatment and those that provide effective pharmacotherapies, like methadone or buprenorphine. We know that agonist therapies for opioid use disorder prevent HCV by reducing craving, use, and injection frequency, and that retention in opioid agonist treatment is associated with drastic reductions in mortality risk.[2] Two federal regulations were enacted in 2016 with the intent to expand access to effective office-based agonist treatment. The Obama administration increased the patient limit for practitioners prescribing buprenorphine from 100 to 275 patients, and Congress passed the Comprehensive Addiction and Recovery Act, which extends the privilege of buprenorphine prescribing to physician assistants and nurse practitioners. Also in 2016, the American Board of Medical Specialties recognized addiction medicine as a medical subspecialty, which, along with a growing number of addiction medicine fellowships, aims to increase the physician workforce trained to prevent, treat, and manage addiction in medical practice. These initiatives strengthen the US response to the opioid epidemic, but it is unclear if even these steps will be enough to make a dent in the wide treatment gap between those with opioid use disorder and the need for evidence-based treatment. Nor is it clear if these initiatives will affect the disparities seen in this gap by racial/ethnic groups and the unmet need in rural areas.[3]

HEPATITIS C VIRUS INFECTIONS

HCV infection rates continue to increase, especially among younger age groups—a

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population that is difficult to engage and link to care—and all racial/ethnic groups. They remain consistently highest among American Indian/Alaska Native people, whose rates are more than double those of non-Hispanic Whites. Tracking acute HCV infections is not an ideal way to conduct HCV surveillance, because HCV is largely asymptomatic and case detection is dependent on identifying signs and symptoms of acute liver inflammation and appropriate testing. Underreporting for HCV as a result of underresourced surveillance and underestimation of cases adds to the complex challenges of truly understanding and responding to HCV as a public health threat, especially in rural areas. Another element in this perfect storm is its potential to (as the authors say) "thwart the nation's efforts to control morbidity and mortality associated with HCV infection," consequently undermining the National Academies of Sciences, Engineering, and Medicine's ambitious national strategy for the elimination of hepatitis B and C and the CDC's Viral Hepatitis Strategic Plan for 2016 through 2020.

PREVENTIVE HEPATITIS C VIRUS VACCINE

Zibbell et al. note the need for integrated approaches to prevention and care, which include syringe service programs (SSPs), addiction pharmacotherapies, and comprehensive HCV testing with linkage to care and treatment of HCV-infected people who inject drugs to reduce HCV prevalence and incidence. Curative therapies for HCV introduced in 2014 have revolutionized HCV care; in addition to SSPs and effective treatment of opioid addiction, HCV treatment has increased the potential to stem the rising HCV epidemic.

Significantly missing from this three-pronged approach to the elimination of HCV as a public health threat is the critical need for a preventive HCV vaccine. Incidence rates of HCV among people who inject drugs, which have been 20% for many years, are now cresting over 30% in some areas (K. Page, unpublished data, 2017). SSPs remain illegal in many states; there are significant geographic disparities, especially for rural areas,[4] and successful implementation of SSPs in areas that heretofore have not had such programs is challenging.[5] Standard-of-care pharmacotherapies for opioid use disorder remain woefully out of reach for many people who inject drugs who cannot afford them, or where social and civic leaders insist on less effective abstinence-based or non-addictive treatments.[6] Additionally, medical providers and insurance plans often deny curative HCV treatment to persons who use drugs. To achieve 100% HCV coverage, SSPs and drug treatment programs will need to be at least tripled, and HCV treatment rates will need to equal or exceed HCV incidence rates.

REACHING THE GOALS

Effective prevention and elimination of HCV will require many tools, but without a vaccine, we are unlikely to reach the goals proposed by the National Academies of Sciences, Engineering, and Medicine or the CDC. Adding a prophylactic vaccine has the potential to significantly accelerate this process by almost double, and with reduced costs.[7] Only one infectious disease in humans has been eliminated without a concomitant vaccine—yaws, a highly localized infection with a treatment that costs pennies. To date, only one HCV vaccine candidate has been entered into clinical efficacy trials (NCT01436357; https://clinicaltrials.gov). The need for a vaccine has never been greater, but funding and attention to this public health threat are dwarfed by research resources directed elsewhere and the inaccurate view that effective HCV treatment has "solved the HCV problem." The storm is still just brewing—we have a generation of young adults rapidly contracting HCV. Let's continue to advocate for better prevention with all available tools and new ones, including HCV vaccine development. It is the only way to avoid a second baby-boomer HCV epidemic. AJPH

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