Can Treating Injection Drug Users Help Eradicate Hepatitis C?

Widespread treatment of hep C among this population would likely drive down transmission rates. But cost is a major barrier.

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Now that treatments for hepatitis C virus (HCV) are so effective and tolerable, talk of one day eradicating the virus has begun to move out of the realm of mere fantasy. But the sky-high cost of the drugs stands as a major obstacle to such a feat, as does the fact that a considerable proportion of people with hep C are unaware they have the virus. Additionally, the lack of an HCV vaccine complicates efforts to prevent the virus's spread.

Injection drug use, specifically the sharing of needles or other drug paraphernalia, or "works," is a major driver of hep C transmission around the world. Efforts to reduce the number of people living with the virus (known as prevalence) as well as annual transmissions (called incidence) would logically focus on this high-risk group.

Full eradication of hep C "is aspirational," says J.F. Dillon, MD, a professor of hepatology and gastroenterology at the University of Dundee in Scotland, "but that doesn't mean that we shouldn't aspire to do it. It is within our grasp if we are motivated enough and the communities work together."

Other benchmarks along the way to eradication could themselves indicate considerable success in curbing the epidemic. According to World Health Organization definitions from 1998, "control" of the virus generally means reducing prevalence, incidence or related sickness or death to "acceptable" local levels. Moving closer to eradication, there is "elimination," which means reducing incidence to zero in a particular area. Eradication requires that the virus is never again transmitted and that further interventions to keep incidence at zero are not needed. (The precise definitions of these terms are subject to debate.)

Smallpox, declared eradicated in 1980, remains the only disease to have achieved such status.

Harm reduction efforts including syringe exchange programs and opioid substitution therapy to treat addiction may have some effect on hep C rates, but research suggests that alone they are unlikely to make a huge dent. According to a paper Dillon recently published in Alimentary Pharmacology and Therapeutics, multiple studies based on mathematical modeling have projected

that using hep C treatment as prevention among injection drug users (IDUs) could indeed play a major role in eradicating the virus.

“If you assume that a single [IDU] with the virus could pass that on to between two and six other people, if you treat that one person before they pass it on, you’ve then [effectively] cured two to six other people,” says Dillon. “That’s hugely cost-effective.”

Until recent years, hep C treatment could last as long as a year and required weekly injections of interferon, a drug that is associated with flu-like side effects. Even then, cure rates were moderate at best. Prevailing wisdom held that IDUs could not successfully complete such an onerous drug regimen, so treatment was often withheld from them. But now, research increasingly shows that IDUs can do just fine on the current crop of highly tolerable, interferon-free hep C regimens, which require only eight to 24 weeks of treatment.

Cost also restricts who receives treatment. Because hep C treatments are so expensive, insurers and other entities paying for their use tend to restrict them to those who have more advanced liver disease. Treating hep C when someone has advanced liver fibrosis (scarring) or cirrhosis can indeed reduce many risks associated with liver disease and lower associated health care expenses. But those with such advanced disease, who may have been living with HCV for decades, likely pose less of a risk of transmitting the virus to others by that point.

In the United States, for example, an estimated three quarters of people with the virus are baby boomers, individuals born between 1945 and 1965. In theory, they largely contracted the virus through unsafe medical procedures during the mid–20th century and so are unlikely to pass the virus on to others today.

Particularly in high-income nations, people with HCV who are currently injecting drugs, who are typically younger than those with advanced liver disease, are the source of much of today’s transmissions.

“If we want to talk about elimination or control or treatment as prevention, the people that you want to target are the young at-risk injectors,” says Jason Grebely, PhD, an associate professor of epidemiology at The Kirby Institute at UNSW in Sydney. “Because that’s where the infections are occurring.”

According to a 2008 estimate, there are 16 million active IDUs worldwide, and perhaps half are chronically infected with HCV.

Natasha Martin, DPhil, an associate professor in the Division of Global Public Health at the University of California at San Diego, adds, “In settings, in particular some low-middle income countries where transmission routes other than injecting drug use may dominate”—such as unsterilized medical equipment or tattooing—“more research is needed to address the components necessary for elimination.”

Regarding the implementation of hep C treatment as prevention efforts among IDUs, Dillon

advocates what he calls “the big bang approach”: the rapid scaling up of treatment among a local population. Such an initially aggressive effort is vital to prevent active users who are cured of HCV from contracting the virus again through their ongoing injection drug use. By treating widely and therefore lowering the overall prevalence of hep C in one area’s network of IDUs, the individual risk of reinfection drops as well.

Targeting treatment to those most at risk of transmitting the virus is one way to gain the greatest public health impact from money spent on hep C drugs. A 2013 modeling estimate conducted by Grebely, Martin and others projected that if 25 percent of one area’s IDUs had hep C, treating just 1.5 percent of them per year could cut in half the prevalence of the virus in 15 years. In part because the risk of reinfections pushes back against the power of treatment as prevention, successfully halving the prevalence of HCV in an IDU population with a greater than 65 percent HCV infection rate would require treating 10 percent of those infected per year.

Given that, to date, projections about the potential impact of hep C treatment as prevention efforts are based only on such mathematical modeling, researchers such as Dillon who advocate for treating HCV among IDUs to achieve a wider public health benefit are in need of real-world evidence to support their theories. To that end, Dillon and his colleagues are gearing up to study how widely treating IDUs in a particular region in Scotland affects hep C prevalence and incidence among them.

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