Barriers to Treatment Among New York City Residents with Chronic Hepatitis C Virus Infection, 2014

ABSTRACT

Objective. New, highly effective hepatitis C virus (HCV) medications recently changed the landscape of HCV treatment. Access to treatment, however, is limited. The New York City Department of Health and Mental Hygiene conducted an enhanced surveillance project to better understand the reasons patients are not treated for HCV.

Methods. In June 2014, we randomly selected 300 adults who were reported through routine surveillance as having a positive HCV ribonucleic acid test result and who had seen a medical provider since June 2012. We collected information on demographics, treatment, and barriers to treatment from these 300 patients and their providers by telephone, fax, mail, and medical record review.

Results. Of 179 providers, 74 (41%) cited co-occurring conditions and 50 (28%) cited patients not keeping follow-up or referral appointments with specialists as common barriers to treatment. Forty providers (22%) reported that they do not prescribe HCV medications and instead refer patients to specialists for treatment. Of 89 patients citing barriers to treatment, 30 (34%) cited co-occurring conditions, 26 (29%) cited concerns about side effects, 21 (24%) indicated not feeling sick, 15 (17%) cited waiting for a better treatment regimen, and 12 (13%) cited medication costs or insurance issues. Only 11 providers and 10 patients denied any barriers to treatment.

Conclusion. Increasing the number of New York City residents with HCV infection who are treated and cured will require programs to increase provider capacity, change provider behavior in treating patients with substance use and medical conditions, improve patient awareness of new medications, provide patient navigation and care coordination support through treatment, and initiate advocacy and policy work.
The hepatitis C virus (HCV) is the most common cause of blood-borne infection in the United States. The National Health and Nutrition Examination Survey (2003–2010) estimates that nearly 3 million people are infected with chronic HCV. The New York City Department of Health and Mental Hygiene (DOHMH) estimates that 146,000 people are living with chronic HCV in New York City. Chronic HCV infection can lead to serious complications, including liver cirrhosis, hepatocellular carcinoma, and death. Those born between 1945 and 1965 account for more than 80% of all people infected with HCV in the United States. The burden of HCV disease is also high among injection drug users and people with human immunodeficiency virus (HIV).

The goal of HCV treatment is to cure HCV infection through sustained virologic response to prevent morbidity and mortality from HCV-related liver and extra-hepatic diseases. Prior to December 2013, HCV treatment included interferon, which has unpleasant side effects and numerous contraindications. HCV treatment now consists of several all-oral interferon-free regimens with cure rates higher than 90% and few contraindications. Many people with medical conditions that were contraindications to older regimens are now good candidates for treatment. New treatments are simpler to take and have fewer and less severe side effects than interferon-based regimens; however, they cost more than $80,000 per treatment course. In addition, many patients with HCV infection face other barriers to initiating HCV treatment, including lack of insurance, high insurance copays, restrictive insurance policies that limit coverage based on liver disease severity, lack of awareness of programs that cover care costs for uninsured or underinsured individuals, difficulty accessing specialists, misconceptions about treatment, and concerns about side effects.

The objective of this study was to examine why—from both a patient and provider perspective—a sample of New York City residents with HCV infection are not prescribed HCV treatment.

METHODS

We conducted a survey of 300 New York City residents with chronic HCV infection and their providers in 2014. Hepatitis C is reportable under the New York City Health Code. The New York City DOHMH has received data on positive HCV antibody tests with a high signal-to-cutoff ratio since 1991, positive HCV ribonucleic acid (RNA) and genotype tests since 2000, and negative HCV RNA test results since 2014. More than 95% of HCV results are reported electronically.

DOHMH uses a disease surveillance and case management system, Maven, to collect, link, and de-duplicate all HCV laboratory reports for each patient.

Sample

We defined individuals with chronic HCV infection as having a positive HCV RNA test, being alive, residing in NYC, and having no reported negative HCV RNA test as of June 2014. Reported HCV laboratory tests (antibody, HCV RNA, and genotype) were used as proxies for medical provider visits. Patients meeting our definition of chronic HCV infection who had seen a medical provider in the two years before sampling (June 2012–May 2014), had a positive HCV RNA test at a year or more prior to sampling (June 2013 or earlier), and were aged 31–70 years were eligible for inclusion in our study.

Of the 109,093 patients known by DOHMH to have chronic HCV infection, 44,986 (41%) had a provider visit between June 1, 2012, and May 31, 2014 (Figure). Of these 44,986 patients, 9,795 were excluded because they had their first positive HCV RNA report after June 2013 and (1) may have been infected in the previous year and not at a disease stage advanced enough to qualify for treatment under current insurance restrictions or (2) may have been recently identified as chronic HCV patients and had not yet had time to complete a medical workup and be considered for HCV treatment. We also excluded 433 people aged 30 years or younger, because they were more likely to have acute infection, and 3,579 people older than 70 years of age, because they may have had a high rate of medical conditions that precluded treatment. A total of 31,179 patients were eligible for sampling.

Using simple random sampling with no replacement, we selected 300 (1%) of the 31,179 patients who were eligible for investigation based on staff resources and time constraints. If preliminary investigation during administration of the patient or provider questionnaires or medical record review revealed that an individual did not meet the eligibility criteria, data collection was halted and the individual was excluded. We further excluded individuals who were identified during investigation as in treatment for HCV; in post-HCV treatment (i.e., awaiting sustained virologic response or cure, as indicated by a negative HCV RNA test 24 weeks after finishing medication); or cured. We included patients who had prior unsuccessful HCV treatment.

We excluded 92 (31%) of the 300 patients from analysis for the following reasons: residing outside New York City (n=7), being deceased (n=13), inability to reach patient or provider (n=10), most recent
HCV RNA test result being negative (n=13), currently in HCV treatment (n=24), in post-HCV treatment (n=11), or cured (n=14). We analyzed data on 208 (69%) patients known to be HCV-infected and not in treatment at the time of the study.

Survey instruments
Survey questions, including those on co-occurring medical conditions, alcohol and drug use, and mental health issues, were informed by previous DOHMH case investigation survey instruments, advice from medical
professionals, and published studies. The surveys were reviewed by DOHMH colleagues familiar with the subject and pilot tested in 25 case investigations. Lessons learned during the pilot phase were incorporated into the final survey instruments. Data on co-occurring conditions were collected as part of the barriers to treatment question on both provider and patient surveys. Respondents could check conditions from a list and write in responses that were standardized for analysis.

Provider survey. During the study period from June through November 2014, investigators verified fax numbers of providers listed on the patient’s most recent laboratory report and faxed questionnaires to their providers to collect information on patient demographics, clinical items, and HCV care history. Providers were asked to return the surveys by fax or postal mail. In addition, we asked providers about obstacles to the patient’s initiation of treatment with the question, “If patient currently has barriers to initiating antiviral therapy for hepatitis C, what are they?” Providers used a checklist and a single free-response comment field to respond. If no response was received within five days, investigators telephoned the provider to administer the questionnaire orally. If providers mentioned that the patient was referred to a specialist, or if the patient mentioned a more recent provider, investigators attempted to interview that provider. If providers did not complete the questionnaire after repeated contact attempts, investigators reviewed the patient’s medical record to complete the questionnaire. Investigators sought to obtain all provider questionnaires and pursued difficult-to-reach providers and hard-to-access medical records throughout the study period. Of 300 patients selected, provider questionnaires were completed for 290 (97%) patients; 125 (43%) questionnaires were completed by telephone interview, 87 (30%) by chart review, and 78 (27%) by fax. None were returned by postal mail.

Patient survey. One week after initiating contact with the provider, investigators contacted patients by telephone to collect data on sociodemographics, medical care, health status, past experience with HCV medications, and perceived barriers to initiating treatment with the question, “Currently, what are your reasons for not starting antiviral treatment for your hepatitis C?” Responses were collected by interviewers using a checklist and a free-response comment field. If unable to reach the patient, investigators left up to two voice messages three days apart asking the patient to call DOHMH. For patients with a reported cellular telephone number, investigators sent a text message after the first voicemail. For patients unreachable by telephone, investigators mailed a copy of the questionnaire to the patient. After the interview, investigators offered to send an educational booklet and a list of local HCV support groups. Of 300 patients sampled, we obtained surveys for 112 patients (37%), 21 of whom were among those that met exclusion criteria after preliminary investigation. Of 208 patients not excluded, 91 (44%) completed questionnaires. Of the 117 (56%) non-interviewed patients, 94 (80%) were unreachable, 11 (9%) refused, five (4%) were incarcerated, and seven (6%) were not interviewed for other reasons. Of the 91 completed questionnaires, 80 (88%) responses were obtained by telephone and 11 (12%) were obtained by mail.

Statistical methods
We entered all data into a Microsoft Access database and performed sampling and analyses using SAS® version 9.2. We used Pearson’s $\chi^2$ tests to compare the sex and birth year cohort (1945–1965 vs. other) of the 91 patients who were interviewed with the 117 patients who were not interviewed to determine whether these two groups were significantly different, and we used Clopper-Pearson’s exact method to calculate 95% confidence intervals (CIs). We considered $\alpha=0.05$ to be significant.

RESULTS
Of the 91 interviewed patients, 54 (59%) were men and 73 (80%) were born between 1945 and 1965. Among the 117 non-interviewed patients, 84 (72%) were men and 85 (73%) were born between 1945 and 1965.

Of the 208 patients in the analysis, 102 (49%) were insured by Medicaid; 51 (25%) had private insurance, 14 (7%) had Medicare, 14 (7%) had both Medicare and Medicaid, six (3%) had no insurance, two (1%) had other insurance, and insurance information was unknown for 19 (9%) patients. One hundred fifty-three (74%) patients had discussed HCV treatment with their medical provider in the past year; of these, 45 (29%) were planning to start treatment soon. Genotype tests were reported to Maven for 85% of the 208 patients: 153 (74%) for genotype 1, 13 (6%) for genotype 3, and 10 (5%) for another genotype.

Eighty-nine of 91 (98%) interviewed patients and 179 of 208 (86%) providers answered the question on patient barriers to HCV treatment. One hundred two (57%) providers reported more than one barrier for their patients, and 44 (48%) patients reported more than one barrier to treatment.

Among 179 providers who answered the barriers question, 74 (41%) were primary care or internal
medicine providers, 52 (29%) were gastroenterologists or liver specialists, 23 (13%) were infectious disease specialists, and 30 (17%) had other specialties (e.g., substance abuse, correctional health). Providers cited co-occurring conditions as barriers to treatment for 74 (41%, 95% CI 34, 49) patients, including current use of alcohol or illicit drugs, medical conditions, and mental health issues (Table 1). Fifty providers (28%, 95% CI 22, 35) also cited patients not keeping follow-up or referral appointments to specialists as a barrier. Forty providers (22%, 95% CI 16, 29) reported that they do not prescribe HCV medications, and 39 providers (22%, 95% CI 16, 29) referred patients to providers who prescribe HCV medications. Of the 40 providers who reported not prescribing HCV medications, 26 (65%) were primary care or internal medicine providers.

Of 89 patients citing barriers to treatment, 30 (34%, 95% CI 24, 45) cited co-occurring conditions, 26 (29%, 95% CI 20, 40) cited concern about side effects, 21 (24%, 95% CI 15, 34) indicated not feeling sick, 15 (17%, 95% CI 10, 26) cited waiting for a better treatment regimen, and 12 (13%, 95% CI 7, 22) cited medication costs or insurance problems (Table 2). Only 10 providers and six patients stated that the patient’s HCV disease was not advanced enough to require treatment. Only 11 providers and 10 patients denied any barriers. Patients also expressed concerns in their own words in response to the barriers question, including:

- I do not want to be a guinea pig for the new medication.
- I am scared about the side effects of treatments.
- I was referred to a hospital but missed the appointment.
- My insurance denied my request to start treatment because my liver damage has not progressed enough.
- I do not feel comfortable with my primary care provider. My doctor keeps pushing me to get another liver biopsy, but I do not want to do it. He also keeps pushing me to go to a specialist whom I do not like.
- The pills are too expensive. My daughter has hepatitis C, too, and I do not think she will be covered. I do not want to get cured if she cannot get cured too.

Table 1. Barriers to initiating hepatitis C virus (HCV) treatment among patients with chronic HCV infection, as reported by providers, New York City, June–November 2014

<table>
<thead>
<tr>
<th>Barrier to HCV treatment*</th>
<th>Number</th>
<th>Percent (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any co-occurring condition in patients</td>
<td>74</td>
<td>41 (34, 49)</td>
</tr>
<tr>
<td>Medical conditiond</td>
<td>37</td>
<td>21 (15, 27)</td>
</tr>
<tr>
<td>Mental health issue</td>
<td>34</td>
<td>19 (14, 26)</td>
</tr>
<tr>
<td>Current illicit drug use</td>
<td>23</td>
<td>13 (8, 19)</td>
</tr>
<tr>
<td>Current alcohol use</td>
<td>20</td>
<td>11 (7, 17)</td>
</tr>
<tr>
<td>Not keeping follow-up or referral appointments with specialiste</td>
<td>50</td>
<td>28 (22, 35)</td>
</tr>
<tr>
<td>I don’t prescribe HCV antiviral medicationsf</td>
<td>40</td>
<td>22 (16, 29)</td>
</tr>
<tr>
<td>I refer to a provider who prescribes HCV medications</td>
<td>39</td>
<td>22 (16, 29)</td>
</tr>
<tr>
<td>Patient has concerns about treatment side effects</td>
<td>25</td>
<td>14 (9, 20)</td>
</tr>
<tr>
<td>I am waiting for a better treatment regimen</td>
<td>23</td>
<td>13 (8, 19)</td>
</tr>
<tr>
<td>Patient has history of nonadherence to medications</td>
<td>14</td>
<td>8 (4, 13)</td>
</tr>
<tr>
<td>No barriersg</td>
<td>11</td>
<td>6 (3, 11)</td>
</tr>
<tr>
<td>Liver disease is not advanced enough to require treatment at this time</td>
<td>10</td>
<td>6 (3, 10)</td>
</tr>
</tbody>
</table>

*Providers were asked, “If patient currently has barriers to initiating antiviral therapy for hepatitis C, what are they?” Categories are not mutually exclusive. Only barriers reported by >5% of providers are shown. All responses were selected from a checklist except where noted.

A total of 179 of 208 (86%) providers gave at least one answer to the barriers question, including a write-in response of no barriers; 29 respondents left this section blank.

CIs calculated by using Clopper-Pearson’s exact method

Providers most commonly reported diabetes, renal disease, and hypertension.

Received as a write-in response from providers and standardized for inclusion in the table.

Seventy-four of 179 providers (41%) were primary care/internal medicine doctors, and 26 of 40 (65%) who cited this barrier were primary care/internal medicine providers.

CI = confidence interval
DISCUSSION

This investigation into reasons HCV patients in New York City have not been treated identified several barriers that have not been widely reported in the literature, particularly after the introduction of all-oral regimens. Providers reported alcohol, drug use, or medical conditions as key factors precluding treatment, identifying a potential gap in provider knowledge about current HCV treatment recommendations and contraindications and on the effectiveness of treatment in people with these co-occurring conditions. Nearly one-quarter of providers who reported patient barriers do not prescribe HCV medications. Of those who do not prescribe HCV medications, nearly two-thirds were primary care or internal medicine providers. Providers also reported that patients often do not keep follow-up or referral appointments with specialists; these patients are potentially lost to care. Twenty-nine percent of the patients who had discussed HCV treatment with their providers reported that they were planning to start treatment soon. Many patients, however, reported concerns about co-occurring conditions and not feeling sick, demonstrating the importance of increasing patients’ awareness about new treatments and monitoring liver health even if they feel well. Some patients expressed concern about the cost of medications and insurance obstacles, highlighting a serious policy challenge and a need to increase awareness of financial support for HCV treatment.

This study occurred during the first year of availability of all-oral, interferon-free regimens to treat HCV genotypes 2 and 3. In our survey, conducted from June through November 2014, 17% of patients and 13% of providers reported that they were waiting for a better treatment regimen. An interferon-free combination regimen was released in mid-October 2014 to treat genotype 1 infection. Thus, the provider-reported barrier of waiting for a better treatment regimen has since been eliminated for most patients. However, we expect the patient-reported barrier of waiting for insurance to cover a better regimen to become more common given the high price of the medication and treatment restrictions. Limitations enacted by Medicaid and managed-care organizations on access to new treatments vary by state and can be restrictive and at odds with recent national and international treatment guidelines, which recommend the initiation of HCV therapy in all patients who are willing and able to be treated.

This study indicates that many New Yorkers with HCV have barriers to treatment. It is important to identify solutions and create resources to overcome

### Table 2. Barriers to initiating hepatitis C virus (HCV) treatment among patients with chronic HCV infection, as reported by patients, New York City, June–November 2014

<table>
<thead>
<tr>
<th>Barrier to HCV treatmenta</th>
<th>Patient reports (n=89b)</th>
<th>Number</th>
<th>Percent (95% CIc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any co-occurring condition</td>
<td>30</td>
<td>34 (24, 45)</td>
<td></td>
</tr>
<tr>
<td>I have another medical condition that prevents me from going on HCV treatment.</td>
<td>17</td>
<td>19 (12, 29)</td>
<td></td>
</tr>
<tr>
<td>I have depression, anxiety, or another mental health concern.</td>
<td>11</td>
<td>12 (6, 21)</td>
<td></td>
</tr>
<tr>
<td>I drink alcohol.</td>
<td>2</td>
<td>2 (0, 8)</td>
<td></td>
</tr>
<tr>
<td>I use drugs.</td>
<td>1</td>
<td>1 (0, 6)</td>
<td></td>
</tr>
<tr>
<td>I have concerns about treatment side effects.</td>
<td>26</td>
<td>29 (20, 40)</td>
<td></td>
</tr>
<tr>
<td>I don’t feel sick.</td>
<td>21</td>
<td>24 (15, 34)</td>
<td></td>
</tr>
<tr>
<td>I am waiting for insurance to cover a better regimen.</td>
<td>15</td>
<td>17 (10, 26)</td>
<td></td>
</tr>
<tr>
<td>I have concerns about cost or insurance issues.</td>
<td>12</td>
<td>13 (7, 22)</td>
<td></td>
</tr>
<tr>
<td>I have no barriers e</td>
<td>10</td>
<td>11 (6, 20)</td>
<td></td>
</tr>
<tr>
<td>I have too many personal responsibilities right now to go on treatment.</td>
<td>7</td>
<td>8 (3, 16)</td>
<td></td>
</tr>
<tr>
<td>My doctor says that my liver is doing fine and that I do not need treatment.</td>
<td>6</td>
<td>7 (3, 14)</td>
<td></td>
</tr>
</tbody>
</table>

aPatients were asked, "Currently, what are your reasons for not starting antiviral treatment for your hepatitis C?" Categories are not mutually exclusive. Only barriers reported by >5% of patients are shown. All responses were selected from a checklist except where noted.
bEighty-nine of 91 (98%) interviewed patients who were HCV-infected and not in treatment provided at least one answer to the barriers question.
cCI calculated by using Clopper-Pearson’s exact method.
dPatients most commonly reported diabetes, renal disease, and heart disease.
eReceived as a write-in response from patients and standardized for inclusion in the table.

CI = confidence interval
these barriers. Improving the skills and treatment capacity of providers who care for HCV-infected individuals could decrease the need for referrals and reduce loss to follow-up. Continuing medical education activities are widely used but not effective in changing provider behavior; thus, a multipronged approach combining continuing medical education activities, peer-to-peer learning, and telementoring is needed. For medical providers who do not treat HCV, linkage-to-care resources such as toolkits, site locators, and information about comprehensive care programs with patient navigators can help guide patients to an HCV treatment provider.

Increasing attendance to follow-up and specialist appointments and adherence to treatment can be achieved through appointment reminders and support by telephone, text, online, or in-person navigation services, as has been widely demonstrated for HIV infection and is beginning to be applied to HCV infection in New York City and elsewhere. Public health campaigns can provide information that new HCV medications are all oral, shorter in duration, and more tolerable and effective than old regimens. Public health campaigns can also promote the importance of monitoring liver health to detect changes in disease stage even in the absence of symptoms. Providers can be informed that most drug, alcohol, and mental health issues, and medical conditions are no longer clear contraindications to HCV treatment; with adequate resources, patients with such co-occurring conditions can be successfully treated.

Patient-reported concerns about the high cost of medications and insurance problems reflect restrictions imposed by health insurance providers, which are a major hardship and a national policy consideration that will take a concerted effort to resolve. In the meantime, these challenges can be met to some extent through patient navigators, care coordinators, medical assistants, and nurses who can assist with the processes of prior authorization and appeals and patient assistance program applications. These specialty supportive services, however, are not currently covered by traditional insurance reimbursements and are not available to all HCV patients who may need them.

Limitations
This study was limited by several factors. First, most investigations were conducted from June through October 2014, before the introduction of interferon-free oral therapy for genotype 1, the most common genotype among individuals in our study, which became available in mid-October. Second, patients with more stable life situations may be easier to reach for interview and also more engaged with medical care, which may make them more likely to initiate treatment. Thus, this research may have been subject to selection bias. However, we collected data from both patients and providers; moreover, differences between interviewed and non-interviewed patients by birth cohort and sex were not significant, suggesting that the impact of selection bias may be limited. Third, some providers with multiple practices or from large hospital systems were difficult to reach for interview. Questionnaires were sometimes completed by infection control staff members or by chart review rather than by speaking with the provider; therefore, some details about the patients’ care known only by the provider may not have been captured. Fourth, we received repeated oral or written answers to the question on barriers to treatment from providers and patients that were not available in our checklist, including “not keeping follow-up appointments” and “no barriers.” It is possible we undercounted occurrences of these responses. Additionally, the provider question on barriers to treatment was worded as, “If patient currently has barriers to initiating antiviral therapy for hepatitis C, what are they?” In retrospect, this question would have been better phrased in two parts, with the first asking, “Does the patient currently have barriers to initiating antiviral therapy for hepatitis C?” and, if yes, “What are they?” However, 86% of interviewed providers responded to the question, so the impact of the phrasing was likely limited.

CONCLUSION
This study provides information to guide interventions aimed at reducing barriers to HCV treatment. Programs to increase provider capacity, improve provider ability to care for patients with substance use disorders, improve patient and provider awareness of new medications, provide support to patients during treatment, and promote advocacy and policy work are all needed to increase the number of New Yorkers with HCV infection who are treated and cured.

The authors thank case investigation staff members for conducting patient and provider interviews, Sharon K. Greene for guidance on methods and results, Marcelle Layton and Sharon Balter for helpful feedback on the article, Margaret Millstone for editorial assistance, and Jay Varma for providing the idea for this study. Because this survey was part of data collected for routine public health surveillance, institutional review board approval was not required.
REFERENCES


