

Original Article

Methadone Maintenance Patients' Knowledge, Attitudes, Beliefs, and Experiences Concerning Treatment for Hepatitis C Virus Infection

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Hepatitis C virus (HCV) knowledge, attitudes, beliefs, and experiences (KABE) of 64 HCV antibody positive methadone maintenance treatment (MMT) patients were assessed in conjunction with acceptability of an on-site semi-structured HCV education session, HCV RNA diagnostic testing, HCV treatment motivational assessment, and initiation of HCV treatment. The KABE interviews were conducted in 2006 and 2007 in an urban New York State MMT clinic in affiliation with a NIDA-funded HCV research project. The majority had basic knowledge of HCV disease, but poor understanding of

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HCV testing and treatment. While the majority of participants expressed fear of HCV treatment side effects, 88% accepted HCV RNA testing and 78% expressed willingness to start HCV treatment with the majority of chronically infected choosing to start HCV treatment medications. Study limitations and implications are discussed.

Keywords hepatitis C; treatment; knowledge; attitudes; beliefs; experiences; methadone; opioid; substance use; psychiatry

Introduction

Throughout the world, but particularly in industrialized countries, such as North America, Europe, and Australia, hepatitis C virus infection (HCV) is endemic in injection drug users (IDUs) (Amon et al., 2008; Dore, Law, MacDonald, and Kaldor, 2003; Hagan et al., 2007; Roy et al., 2002; Shepard, Finelli, and Alter, 2005). Based on current data from the World Health Organization (WHO), it is estimated that approximately 2.2% of the world population are HCV-infected with the highest prevalence noted in the African and Eastern Mediterranean regions with HCV infection exceeding that of HIV in Egypt (Lavanchy, 2009). Approximately 4 million persons in the United States are HCV-infected (Perez, Farrington, Pecorano, Hutin, and Armstrong, 2004), with an estimated seroprevalence between 75% and 90% in long-term (1–5 years) IDUs and 18% to 38% in short-term (<3 years) IDUs (Amon et al., 2008; Diaz et al., 2001; Garfein et al., 1998; Hahn et al., 2002; Murrill et al., 2002; Thorpe et al., 2000, 2002). Over 3 million Americans have injected heroin and over 200,000 are in methadone maintenance treatment (MMT) with an estimated 150,000 to 180,000 (75–90%) of these MMT patients infected with hepatitis C virus (Amon et al., 2008; Krantz and Mehler, 2004; Rounsaville and Kosten, 2000).

The revised National Institutes of Health (NIH) HCV consensus panel (NIH, 2002) and the American Association for the Study of Liver Disease (AASLD) HCV practice guidelines (Strader, Wright, Thomas, Seeff, and American Association for the Study of Liver Diseases, 2004) recommend an individualized approach to HCV treatment regardless of substance use history and strongly encouraged ongoing substance user treatment, such as MMT programs. There is increasing evidence that patients with current or former substance use disorder (SUD) can successfully complete HCV treatment (Backmund, Meyer, Von Zielonka, and Eichenlaub, 2001; Dalgard et al., 2002; Jowett et al., 2001; Sylvestre, 2005). Continued evidence demonstrates the safety and feasibility of providing treatment for chronic HCV infection to MMT patients (Bonkovsky et al., 2008; Mauss, Berger, Goelz, Jacob, and Schutz, 2004; Sylvestre, 2002; Van Thiel, Anantharaju, and Creech, 2005). Continued research and development of HCV treatment within the context of the MMT setting has great potential to result in a significant increase in HCV-infected MMT patients obtaining appropriate HCV evaluation and treatment. However, numerous barriers continue to impede HCV treatment for patients with SUDs (Edlin et al., 2001; Hagan et al., 2001; Stein, Maksad, and Clarke, 2001; Stroove et al., 2005), such as the complexity of treatment and fear of its associated side effects, provider uncertainty about treating drug users, and problems related to adherence (Litwin, Soloway, and Gourevitch, 2005; Morrill, Shrestha, and Grant, 2005; Sylvestre, 2005).

The seroprevalence of HCV antibodies in the injection drug-using population has been estimated to range from 53 to 96% (Crofts, Jolley, Kaldor, van Beek, and Wodak, 1997; Hallinan, Byrne, Amin, and Dore, 2005; McCarthy and Flynn, 2001; Novick and Kreek, 2008) and as high as 67 to 96% in patients enrolled in MMT programs with associated treatment completion rates of 28 to 94% (Novick and Kreek, 2008). The HCV antibody seroprevalence rate in the MMT clinic population utilized in this study was estimated at 83% (Batki, Cornell, and Peek, 2002). The MMT programs are effective

at reducing injection drug use and have been shown to reduce HIV risk behaviors and transmission (Ferrando and Batki, 2000; Kwiatkowski and Booth, 2001; Metzger et al., 1993; Moss et al., 1994; Sorensen and Copeland, 2000; Thiede, Hagan, and Murrill, 2000). Less is known about the impact MMT may have on HCV risk behaviors, transmission, and willingness to undergo medical treatment. Willner-Reid, Belendiuk, Epstein, Schmittner, and Preston (2008) had evaluated HCV and HIV risk behaviors of MMT participants in a U.S. urban clinic finding that HCV antibody positive patients were more likely to engage in safer drug use and sex-related practices during the MMT treatment. Munoz-Plaza et al. (2008) conducted interviews of MMT HCV-infected and non-infected patients regarding their perceptions of HCV disease with results that indicated there was extensive negative peer-based communication about HCV treatment, fear of side effects, and misperceptions regarding the disease and its treatment, indicating a significant need for improved education targeting HCV at risk individuals.

This study assessed HCV knowledge, attitudes, beliefs, and experiences (KABE) in HCV antibody positive MMT participants and assessed readiness to consider HCV treatment after a 30-min HCV disease/treatment education session. The study assessed HCV disease/treatment knowledge, provided accurate HCV information in a one-on-one format, offered immediate serological testing to confirm chronic HCV disease, and provided a direct link to HCV treatment in a single visit. This study also assessed the number of participants who, after receiving HCV education, chose to enroll in a NIDA-funded controlled trial of on-site (located in an MMT clinic) versus off-site (located in an urban gastroenterology clinic) HCV treatment (ClinicalTrials.gov Identifier NCT 00148031). The objective of this report is to describe KABE in HCV-infected MMT patients, as well as to examine the impact of a single HCV education session associated with the opportunity to receive serological HCV RNA testing and standardized HCV treatment from an on-site research team has on MMT patients' willingness to engage in HCV treatment.

Methods

Subject Eligibility and Data Collection Procedures

The study participants were patients at an urban hospital-affiliated MMT clinic in Central New York. Participants had to have a documented positive HCV antibody test result prior to study entry. Subjects were recruited from July 2006 through August 2007 using posters, fliers, and recruitment fairs at the MMT location. Participants provided written consent and study procedures were approved by SUNY Upstate Medical University and Crouse Hospital Institutional Review Boards. Following written consent, the MMT clinic record was reviewed for the documentation of a positive HCV antibody test. If such documentation was not available in the MMT record, the subject was offered the opportunity to have this test conducted by the research project at no cost to the patient. Once the HCV antibody titer was verified, the researchers proceeded with conducting the HCV KABE questionnaire. This questionnaire was administered by research staff with extensive training in HCV disease and treatment recommendations. All respondent data were analyzed using SPSS 16.0 package for windows (SPSS Inc., Chicago, IL, USA).

KABE Questionnaire

The KABE questionnaire included sections assessing demographic characteristics, drug use history, contact with health care providers, awareness of HCV diagnostic test results (i.e., genotype, viral load, or liver biopsy), history of hepatitis A and B vaccination, HCV

disease and treatment knowledge, HCV treatment experiences (if applicable), attitude/beliefs regarding HCV disease, and willingness to consider HCV treatment. Questions were designed mainly to be answered with “yes,” “no,” or “unsure.” Most questions were framed as multiple choice and a few were open ended, including questions regarding HCV treatment fears and HCV treatment side effects.

A master’s level nurse practitioner with extensive training in HCV disease and treatment provided a 30-min semi-structured HCV educational counseling session. Each counseling session followed a written format to ensure consistency of the provided information. PowerPoint slides were used to aid in the counseling session. The discussion was interactive, allowing the counselor to assess the subject’s understanding of key points prior to moving forward with the next topic. The discussion was tailored to the educational level of the subject, which ranged from 5th grade to master’s level with a mean education level of 12 (± 2) years.

HCV Educational Session

The educational session included an explanation of HCV disease, basic liver functions, the meaning of terms, such as fibrosis and cirrhosis, HCV disease progression, HCV risk factors and harm reduction methods, hepatitis A and B disease, and vaccination. HCV epidemiology and the impact of racial background on HCV treatment outcomes were discussed. The session also discussed HCV testing; particularly, the meaning and significance of the HCV antibody test and quantitative HCV viral load result, and presented information regarding the optional liver biopsy procedure and the meaning of the biopsy results. The goal of the HCV treatment was discussed providing an explanation of standard HCV treatment medications (pegylated interferon and ribavirin), effectiveness of treatment, and length of treatment based on genotype. Potential medication side effects were reviewed in detail, including such issues as flu-like symptoms, which can mimic withdrawal symptoms. Side-effect management options were also discussed. The subject was encouraged to ask questions and seek clarification.

HCV Contemplation Ladder

Following completion of the educational session, the subject was asked to rate their level of readiness to consider HCV treatment by choosing a number from 0 to 10 on an HCV Treatment Contemplation Ladder. This measure was modified from the Contemplation Ladder designed by Biener and Abrams (1991) as a measure of readiness to consider smoking cessation. Each rung of the ladder represents a ladder stage with an affiliated number starting with zero on the bottom rung and 10 on the top rung. Each rung represents a stage of readiness to consider HCV medical evaluation. The bottom rung indicates no thought of seeking HCV medical evaluation and the top rung represents readiness to take action to attain HCV medical care. Each rung represents an ascending level of readiness.

HCV Quantitative Viral Load

Following completion of the educational portion of the study, subjects were given the option to have a HCV RNA quantitative viral load blood test completed in order to assess for chronic HCV disease. This test was not a mandatory part of the study and the test was billed through the subject’s own medical insurance. If medical authorization was needed, the research nurse practitioner obtained this prior to conducting the test. If the subject chose to have the test completed, a follow-up visit was scheduled to review the result. At

the follow-up visit, the research nurse practitioner discussed the positive or negative HCV viral load test result and its meaning. If the subject was interested in considering HCV treatment due to a positive viral load result, the researcher offered the opportunity to receive assessment for eligibility to participate in a NIDA-funded controlled trial of on-site versus off-site HCV treatment. Researchers emphasized that participation in the HCV treatment was strictly voluntary and would have no influence on the patient's MMT treatment status. If the subject was not interested in the research study opportunity, the researcher provided information and, if desired, referral assistance to a local gastroenterology clinic providing HCV medical care. If the viral load result was negative, the research NP reviewed preventive measures and encouraged routine follow-up with a primary care provider (PCP).

Results

Demographics

The demographic characteristics of the 64 participants are summarized in Table 1. They were predominantly male (55%) and white (77%). The mean age of participants was 42 (± 12) years. Eighty-three percent of participants had medical insurance with Medicaid (60%) being the primary source of insurance. Forty-three percent of participants were divorced or separated with a large minority never married (38%). Most (68%) lived independently with 17% living with family, 11% in structured residences, and 2% homeless. Close to half (45%) reported no personal income and only 17% were currently employed. Twenty-four percent were receiving SSI or SSD and 14% were receiving public assistance.

Table 1
Demographic characteristics—*N* (%)

| | |
|--|-----------------|
| Age (mean yrs \pm SD) | 42 (± 12) |
| Male | 35 (55) |
| Race | |
| Caucasian | 49 (77) |
| African-American | 11 (18) |
| Native American or Hawaiian/Pacific Islander | 2 (3) |
| Mixed/other | 1 (2) |
| Ethnicity | |
| Hispanic | 12 (19) |
| Medical insurance | 53 (83) |
| Medicaid | 38 (60) |
| Private | 10 (16) |
| Medicare | 3 (5) |
| No insurance | 11 (17) |
| Married | 11 (17) |
| Independent living | 43 (68) |
| Income source | |
| Employment | 11 (17) |
| SSI/SSD | 15 (24) |
| Public assistance | 9 (14) |
| No income/other support | 28 (45) |

Table 2
Drug use characteristics—*N* (%)

| | |
|---|---------------|
| History of IV drug use | 58 (91) |
| Age first injected drugs (mean yrs \pm SD) (<i>N</i> = 58) | 24 (\pm 8) |
| History of snorting drugs | 60 (94) |
| Any positive urine drug screening test results: past 90 days: | |
| Opioids | 33 (52) |
| Cocaine | 30 (48) |
| THC | 15 (24) |
| Benzodiazepines | 16 (25) |

Drug Use Characteristics

Table 2 presents drug use characteristics of this population. Almost all (91%) reported a history of injection drug use with an average age of first injection being 24 (\pm 8) years. Over 90% also reported intranasal drug use. MMT chart review of observed urine drug testing in the 90 days prior to study entry demonstrated that over half (52%) had positive opioid urine test results and close to half (48%) had positive cocaine results.

HCV Diagnosis, Counseling, and Testing

The mean age when a subject was first told of a positive HCV antibody titer was 36 (\pm 11) years. This is a 12-year difference from the mean age of first injection drug use in this cohort. Given the statistic that one in five IDUs become HCV infected within 2 years after starting to inject (Amon et al., 2008), this implies that participants in this study may have had HCV disease for several years prior to receiving testing. Few (30%) have ever received any form of counseling from a health care provider regarding HCV disease or HCV treatment and the largest single source (14%) of such counseling came from providers in a substance abuse treatment or criminal justice facility. Eight percent of all participants reported that a MMT counselor provided them HCV education and 6% received this information from their PCP. Only a minority of subjects reported that a primary care or GI health care provider had ever asked them about drug, alcohol, or mental health problems in the context of addressing HCV infection.

Although 45% of the participants reported that their PCP was aware of their HCV diagnosis, only 34% had ever been referred to a GI specialist for treatment evaluation and only 25% had ever attended an appointment with a GI specialist. Sixteen percent of the participants were currently receiving some form of HCV medical follow-up care with 11% receiving the care from a PCP and 5% seeing a GI specialist. Knowledge regarding HCV disease-specific test results was very low; only 5% were aware of HCV genotype and 3% were aware of HCV viral load. Only 6% of participants had ever obtained a liver biopsy (see Table 3).

HCV Knowledge

The nine statements summarized in Table 4 were asked in order to assess basic concepts regarding HCV. The statements pertained to transmission, symptom presentation, alcohol use, disease progression, and effectiveness of treatment. The questions were presented in a true or false format. The majority of subjects answered all nine questions correctly

Table 3
HCV diagnosis, counseling, and testing—*N* (%)

| | |
|--|----------------|
| Age when first diagnosed (mean yrs \pm SD) | 36 (\pm 11) |
| Ever received HCV counseling | 19 (30) |
| From PCP | 4 (6) |
| From MMT provider | 5 (8) |
| From GI provider | 1 (2) |
| From other (rehab/jail) | 9 (14) |
| Ever referred to GI clinic | 22 (34) |
| PCP aware of HCV status | 29 (45) |
| PCP or GI specialist asked about: | |
| Injection drug use | 23 (36) |
| Non-injection drug use | 20 (31) |
| Alcohol use | 26 (41) |
| Mental health problems | 29 (45) |
| Attended GI clinic appointment | 16 (25) |
| Referred by PCP | 11 (17) |
| Referred by MMT staff | 2 (3) |
| Currently under medical care for HCV | 10 (16) |
| PCP | 7 (11) |
| GI Specialist | 3 (5) |
| Aware of HCV genotype | 3 (5) |
| Aware of HCV viral load | 2 (3) |
| Obtained a liver biopsy | 4 (6) |

(see Table 4). Subjects were asked in an open-ended fashion to define cirrhosis and liver biopsy. Responses were coded as correct, incorrect, or no answer. Approximately one-third (36%) defined cirrhosis correctly implying some type of liver disease, 52% provided an incorrect response, and 12% were unsure. The majority (61%) was able to correctly define a liver biopsy as a test that checks severity of liver disease with 17% providing incorrect answers and 22% having no response. Ninety-four percent of participants knew that HCV disease could lead to liver failure and 80% knew that it could lead to liver cancer. Over half (67%) chose the correct answer that there was a 50/50 chance of eliminating the virus with completion of the treatment.

HCV Treatment

Seventeen of the 64 subjects (27%) were offered HCV treatment by a medical provider with only one (2%) participant actually starting the treatment and none had ever completed HCV treatment. None were undergoing HCV treatment at the time of the study interview. Subjects most commonly (19%) reported a lack of understanding as to why they were not offered treatment with 17% indicating that they were recently diagnosed and had not completed medical evaluations. Although a lack of symptom presentation does not exclude the possibility of significant fibrotic changes (Strader et al., 2004), 11% of subjects stated that they were not offered HCV treatment because they had no significant symptoms. Ten percent indicated that current drug or alcohol use were the factors for not receiving the treatment. Thirteen percent reported that they had not become candidates for treatment due

Table 4
HCV knowledge ($N = 64$)

| | True (%) | False (%) | Unsure (%) |
|--|----------|-----------|------------|
| HCV is transmitted through sharing of needles | 98 | 2 | 0 |
| HCV always makes people sick | 14 | 77 | 9 |
| A vaccine can protect against HCV | 20 | 56 | 24 |
| People with HCV can feel fine | 88 | 6 | 6 |
| People with HCV should avoid alcohol | 92 | 5 | 3 |
| A person with HCV can get a different strain of HCV | 84 | 2 | 14 |
| HCV can lead to liver cancer | 80 | 3 | 17 |
| HCV can lead to liver failure | 94 | 0 | 6 |
| What percentage of people who complete treatment eliminate HCV | | | |
| 10% | 27 | | |
| 50% | 67 | | |
| 100% | 6 | | |

to incomplete evaluations, severity of disease, or lack of chronic HCV disease. The most frequently cited reasons for not proceeding with HCV treatment were the fear of side effects (6%) and the belief that active drug use was a contraindication (5%). Refer to Table 5 for further information.

Hepatitis A and B Vaccination

The majority of participants had never completed the vaccination series for hepatitis B (66%) or hepatitis A (77%). Fourteen percent reported exposure to hepatitis B and 5% reported exposure to hepatitis A. Only four (6%) subjects reported that they had ever been referred by a health care provider to obtain hepatitis B vaccination and eight (13%) reported receiving a recommendation to obtain hepatitis A vaccination.

Willingness to Receive HCV Treatment

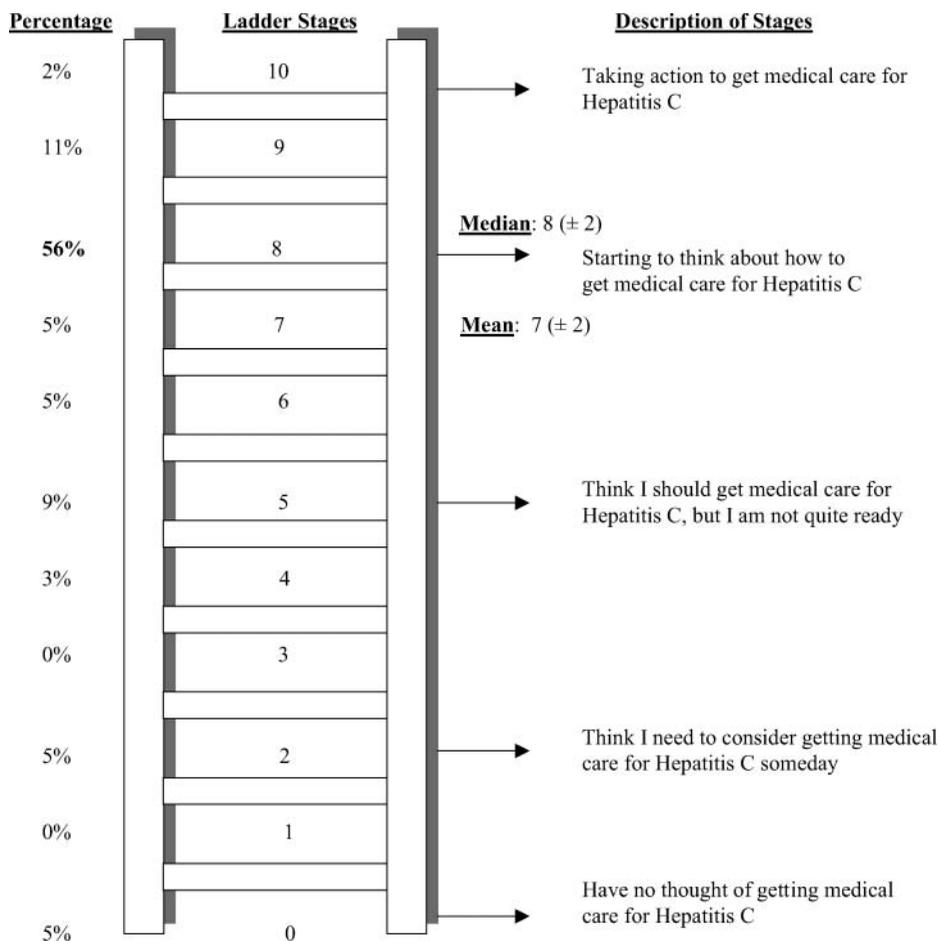
Even though 53% of participants expressed fear of the medication side effects, the majority of participants expressed willingness to receive HCV treatment even if it included weekly injected medication for 3 (82%), 6 (80%), or even 12 (72%) months (see Table 6). Over half (59%) reported treatment willingness even with the risk of fatigue and flu-like side effects and 63% were willing to risk the possibility of irritability or depressed mood associated with treatment. Seventy-two percent would consider treatment even if it meant having a liver biopsy. Participants who expressed interest in HCV treatment were asked why they would consider this difficult treatment. The most frequent answer was “to get healthy” (45%) with 29% indicating they wanted to eliminate the virus and 24% expressing fear of the disease or dying from the disease as the motivating factor. For those persons stating no interest in HCV treatment, the most common reason was the fear of the medication side effects (67%). The most frequently cited side-effect fears included depression/irritability (44%), flu-like symptoms (42%), and fatigue (19%).

Table 5
HCV treatment—*N* (%)

| | |
|-------------------------------------|---------|
| Ever offered HCV treatment | 17 (27) |
| Reasons not offered treatment | |
| No symptoms | 7 (11) |
| Active drug use | 5 (8) |
| Active alcohol use | 1 (2) |
| Active psychiatric symptoms | 3 (4) |
| Newly diagnosed | 11 (17) |
| Unsure why | 12 (19) |
| Other | 8 (13) |
| Ever started HCV treatment | 1 (2) |
| Currently receiving HCV treatment | 0 (0) |
| Completed HCV treatment | 0 (0) |
| Reasons did not start HCV treatment | |
| Fear of side effects | 4 (6) |
| Inconvenient | 2 (3) |
| Active drug use | 3 (5) |
| Medical problems | 2 (3) |
| Psychiatric problems | 2 (3) |
| Other | 2 (3) |

Table 6
Willingness to receive HCV treatment (*N* = 64)

| | Yes <i>N</i> (%) | No <i>N</i> (%) | Unsure <i>N</i> (%) |
|--|------------------|-----------------|---------------------|
| Willing to take weekly injected medication for 3 months | 52 (82) | 2 (3) | 9 (14) |
| Willing to take weekly injected medication for 6 months | 51 (80) | 5 (8) | 8 (12) |
| Willing to take weekly injected medication for 12 months | 46 (72) | 10 (16) | 8 (12) |
| Fear taking HCV medication due to side effects | 34 (53) | 30 (47) | — |
| Willing to take HCV medication if risk of flu-like side effects | 38 (59) | 14 (22) | 12 (19) |
| Willing to take HCV medication if risk of irritability or depression | 40 (63) | 16 (25) | 8 (12) |
| Willing to take HCV medication if had to have a liver biopsy | 46 (72) | 9 (14) | 9 (14) |
| Willing to take HCV medication if 80% chance of clearing the virus | 59 (92) | 2 (3) | 3 (5) |
| Willing to take HCV medication if 50% chance of clearing the virus | 51 (80) | 5 (8) | 8 (12) |
| Currently interested in receiving HCV treatment | 50 (78) | 4 (6) | 10 (16) |



NOTE: This document was altered from its original form to reflect contemplation to seek medical treatment in persons with Hepatitis C rather than smoking behaviors. **REF:** Biener, L., & Abrams, D.B. (1991). The Contemplation Ladder: Validation of a Measure of Readiness to Consider Smoking Cessation. *Health Psychology*, 10 (5), 360-365.

Figure 1. HCV treatment contemplation ladder ($N = 64$). Note: This document was altered from its original form to reflect contemplation to seek medical treatment in persons with Hepatitis C rather than smoking behaviors (Biener and Abrams, 1991).

Following completion of the HCV disease and treatment educational counseling session, participants were asked if they would currently consider starting HCV treatment; 78% expressed willingness. Results of the HCV treatment contemplation ladder (Figure 1) indicated a similar level of treatment consideration with a mean ladder stage of 7 (± 2) and a median of 8 (± 2). Ladder stages 7 and 8 indicate willingness to “start to think about how to get medical care for Hepatitis C.” Only 11% endorsed a ladder stage 9 and 2% ladder stage 10, which indicates willingness to take action to get medical care for HCV.

As noted in Table 7, 56 of the 64 participants (88%) chose to obtain a HCV RNA Quantitative viral load serological test of which 38 (59% of total and 68% of those tested) participants had a positive result. Thirty of the 38 (79%) participants who were serologically

Table 7
HCV treatment progression: frequency and percentage—*N* (%)

| | Yes | No | N/A |
|--|------------------------------------|---------|---------|
| Obtained HCV RNA quantitative test | 56 (88) | 8 (12) | 0 (0) |
| Positive HCV RNA viral load result | 38 (59) | 18 (28) | 8 (13) |
| Median result | 149,000 IU/ml | | |
| Mean result | 3.7 E6 IU/ml (\pm 9.8 E6 IU/ml) | | |
| Signed informed consent for HCV treatment study (total) | 30 (47) | 7 (11) | 27 (42) |
| Signed informed consent for HCV treatment study (positive HCV RNA viral load result) | 30 (79) | 8 (21) | N/A |
| Randomized to a treatment location (total) | 28 (44) | 36 (56) | N/A |
| Randomized to a treatment location (signed informed consent) | 28 (93) | 36 (7) | N/A |
| Of the 28 randomized | # randomized to each site | | |
| MMT site | 13 (20) | | |
| GI clinic site | 15 (23) | | |
| Attended initial HCV medical appointment (total) | 24 (38) | 4 (6) | 36 (56) |
| Attended initial HCV medical appointment (randomized) | 24 (86) | 6 (20) | N/A |
| Started HCV treatment (total) | 12 (19) | 12 (19) | 40 (62) |
| Started HCV treatment (attended medical appt.) | 12 (50) | 12 (50) | N/A |

proven to have chronic HCV chose to complete informed consents for the NIH HCV medical treatment trial offered at the MMT clinic. Twenty-eight (93%) of those participants were randomized to receive medical care at either the MMT clinic or a standard urban GI clinic. A similar number of participants were randomized between the two sites (refer to Table 7). Of the 28 who participated in the HCV treatment study, 24 (86%) attended their initial HCV medical evaluation and 12 (50%) started HCV treatment with pegylated interferon and ribavirin.

Discussion

Summary of Findings

Examination of the knowledge, attitudes, beliefs, and experiences of 64 opioid-dependent patients in an urban hospital-affiliated methadone treatment setting revealed that although the participants had a basic knowledge of HCV disease, knowledge about HCV testing and its treatment was incomplete and/or incorrect. Most subjects, at the time of the interview, did not know the difference between a positive HCV antibody test (indicative of exposure to HCV infection) and a positive HCV viral load (indicative of chronic HCV infection). They were, therefore, unaware of whether or not they were in need of evaluation for HCV treatment. Virtually none of the participants had ever started HCV treatment. After

receiving a semi-structured HCV education session, the majority of participants (78%) expressed willingness to consider evaluation for HCV treatment, which was verified by the HCV treatment contemplation ladder (mean score: 7—starting to think about how to get medical care for Hepatitis C). Offering on-site serological testing for chronic HCV to a group of MMT patients who had just received accurate educational information regarding HCV disease and treatment yielded a high level (88%) of participation. The majority (79%) of those with verified chronic HCV disease elected to be evaluated for HCV treatment within the context of a NIH HCV study in which standard HCV treatment with pegylated interferon and ribavirin was offered, of which, half (50%) progressed to starting HCV treatment.

Study Strengths and Limitations

This study has a unique study design that has not been previously conducted. Knowing that the majority of MMT patients are HCV antibody positive but are often unsure of their current serological status, (Batki et al., 2002; Crofts et al., 1997; Hallinan et al., 2005; McCarthy and Flynn, 2001), this study sought to enroll MMT patients with documented positive HCV antibody status, thus eliminating the concern regarding erroneous self-reporting of HCV status. Understanding that it is difficult to engage IDUs in medical care due to numerous competing priorities, this study was designed to assess the effectiveness of providing on-site (in a MMT clinic setting) HCV education, serological testing, and a direct link to HCV treatment in a single visit. If the participant has chronic HCV disease and desires to be evaluated for HCV treatment, she/he is offered the opportunity to enroll in a NIH HCV treatment study. If a participant desired treatment outside the context of the study, the researcher assisted with referral to the local GI clinic. Although the design of the study does facilitate recruitment into the NIH study, HCV treatment participation was strenuously reinforced as optional with the objective being to assess the impact of having an on-site link to HCV education and treatment.

Study's Limitations. A limitation of this study is a small sample size of 64 participants from one urban MMT clinic, which may not be representative of other MMT patients in other geographic regions. However, the demographic profile of these participants is similar to other studies of US MMT populations (Munoz-Plaza et al., 2008; Strauss et al., 2007). Secondly, we did not include a comparator group of non-MMT HCV-infected IDUs in which their HCV knowledge base and level of interest in HCV treatment could be compared to the MMT cohort. This study design required a face-to-face interview and education session, which could lead to interviewer bias and the participant attempting to provide socially correct and interviewer-desired responses. This type of limitation was minimized by the design of the KABE questionnaire using yes/no or multiple-choice answers with minimal open-ended questions. The HCV educational session was conducted after completion of the questionnaire and further participation (i.e., HCV testing and participation in HCV treatment) was fully at the discretion of the participant. It should be noted that the HCV education session was not assessed for its level of acceptability, nor was the HCV contemplation ladder utilized to assess the effectiveness of the education session. The investigators were only able to report an association between the education session and subjects' readiness to consider engagement in HCV treatment using the HCV contemplation ladder and measuring the number of participants who proceeded with HCV serological testing, medical evaluation for HCV treatment, and ultimately initiation of HCV treatment. The authors are unable to

assign causality to the relationship between the education session and subjects' subsequent behavior.

Conclusions

HCV antibody positive MMT patients in this study demonstrated reasonably accurate basic knowledge of HCV disease, but had significantly poorer understanding of HCV diagnostic testing and treatment eligibility requirements. HCV genotype directly impacts duration of treatment and is a significant predictor of treatment outcome (NIH, 2002; Strader et al., 2004). A quantitative or qualitative HCV RNA viral load result is necessary in order to determine if a HCV antibody positive individual has progressed to a chronic disease state and is a candidate for HCV treatment (Strader et al., 2004). Few participants in this study had knowledge of their genotype or viral load status, nor were they aware of the difference between positive HCV antibody status (exposure to infection) and positive HCV viral load status (chronic infection). This information is critical to HCV treatment consideration. Furthermore, participants demonstrated a lack of understanding of HCV treatment requirements, such as the misconception that a lack of physical symptoms indicates a lack of disease progression or the misconception that drug or alcohol use is always a treatment contraindication. Contributing to this lack of accurate information is the lack of PCP involvement in HCV disease management or referral to GI specialty for further evaluation and treatment recommendations. Although study participants demonstrated very low current HCV treatment utilization, the greater majority expressed a desire for accurate HCV treatment information and willingness to consider HCV treatment despite having marked fear of treatment-related side effects. These findings are consistent with other studies examining IDUs willingness to engage in HCV treatment (Grebely et al., 2008; Mehta et al., 2008; Reynolds, Fisher, Jaffe, and Edwards, 2006).

IDUs need accurate HCV education (Best et al., 1999; Doab, Treloar, and Dore, 2005; Fabris et al., 2006); yet beyond education, HCV positive IDUs have difficulty navigating the increasingly complex health care system and require delineation of treatment options (Astone, Strauss, Munoz-Plaza, Hagan, and Des Jarlais, 2005; Reynolds et al., 2006). With this in mind, this study incorporated an assessment of current HCV disease/treatment knowledge with a one-on-one HCV education session followed by an opportunity for on-site serological testing and an opportunity to engage in HCV evaluation and treatment, if indicated and desired by the participant. The results yielded a very high level of interest in serological testing, even when testing was paid for by the participant's insurance or out of pocket. Furthermore, the greater majority (86%) chose to progress to HCV treatment evaluation and half (50%) then moved forward with initiating treatment.

Gupta, Romney, Briggs, and Benker (2007) conducted a single HCV educational session for 34 HCV-diagnosed patients in inner-city hepatology clinics in New York City, which also indicated that one-on-one education sessions increased participant willingness to consider HCV treatment. However, this study was small in number and did not provide assessment of progression to engagement in HCV evaluation or treatment. In general, HCV population studies and assessment of treatment engagement indicated that very few (14 to 28%) chronic HCV patients in community or VA settings initiate HCV treatment (Cawthorne et al., 2002; Falck-Ytter, Kale, Mullen, Sarbah, and Sorescu, 2002). Falck-Ytter et al. (2002) examined antiviral treatment in 293 urban chronic HCV patients and found that 13% were excluded due to current substance use, 11% declined treatment, and a minority 28% started treatment. This study's design of a single on-site education session associated with immediate serological testing and a direct link to HCV treatment in a

supportive MMT environment led to high engagement in evaluation of HCV eligibility (86%) and progression to HCV treatment (50%) as compared to standard results described in the general HCV population (Cawthorne et al., 2002; Falck-Ytter et al., 2002).

Despite the disproportionately high prevalence of HCV among IDUs and MMT patients, engagement in HCV treatment continues to be infrequent. Our research demonstrates both a feasible and effective format to engage IDUs in the HCV evaluation and treatment processes in a MMT clinic environment. Both this study and several others (Best et al., 1999; Carey et al., 2005; Doab et al., 2005; Heimer et al., 2002; Stein et al., 2001; Strauss et al., 2007; Walley, White, Kushel, Song, and Tulskey, 2005) have shown that IDUs remain misinformed about HCV disease and its treatment and continue to experience barriers to treatment access (Edlin et al., 2001; Hagan et al., 2001; Litwin et al., 2005; Morrill et al., 2005; Stein et al., 2001; Stroove et al., 2005; Sylvestre, 2005). Drug treatment programs, particularly MMT programs due to their large pools of HCV-infected patients, are in a unique position to provide not only accurate HCV education but also to exert a proactive role in facilitating HCV evaluation and treatment opportunities. On-site HCV serological testing, viral load testing, and education and counseling with a direct link to HCV treatment provide a streamlined approach that may increase MMT patients' access to HCV treatment.

Conflict of Interest: All authors declare that they have no conflicts of interests in connection with any aspect of the research.

RÉSUMÉ

Les connaissances, attitudes, croyances, et expériences des patients au traitement d'entretien à la méthadone concernant le traitement de l'infection de virus de l'hépatite C (VHC)

Les connaissances, attitudes, croyances, et expériences (CACE) de 64 patients positifs pour l'anticorps du virus de l'hépatite C (VHC) et sous traitement d'entretien à la méthadone ont été évaluées en conjonction avec l'acceptabilité d'une session éducative de semi-structurée sur VHC, les tests diagnostique d'ARN du VHC, l'évaluation de la motivation au traitement du VHC et son initiation. Les interviews de CACE furent menées en 2006 et 2007 dans une clinique de traitement d'entretien de méthadone d'un centre urbain de l'état de New-York en affiliation avec un projet de recherche du VHC financé par NIDA (Institut National de la Toxicomanie). La plupart avait une connaissance de base de la maladie du VHC, mais une mauvaise compréhension du dépistage et du traitement du VHC, 88% ont accepté le dépistage d'ARN du VHC et 78% ont exprimé la volonté de commencer les médicaments de traitement de VHC dont la majorité sont chroniquement infecté. Des limitations et implications de l'étude sont discutées.

RESUMEN

El conocimiento, actitud, creencia, y experiencia del virus de hepatitis C en pacientes en el mantenimiento de metadona concerniendo el tratamiento del virus de hepatitis C

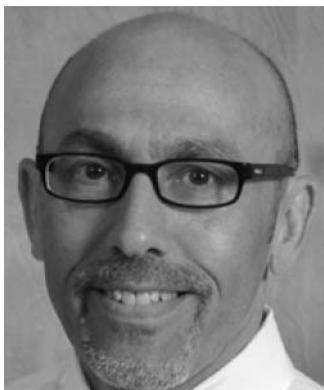
El conocimiento, actitud, creencia, y experiencia de el paciente en el mantenimiento de metadona y con el anticuerpo sesenta cuatro del virus de hepatitis C positivo fueron valorados en conjunción con con aceptabilidad de una sesión medida estructurada local de la

educación de HCV, de RNA de HCV probar diagnóstico, de tratamiento de HCV evaluación motivadora, y de la iniciación de tratamiento de HCV. Las entrevistas sucedieron entre 2006 y 2007 en clínica situado en Nueva York urbana. La mayoría tuvo el conocimiento básico de la enfermedad de HCV, pero pobre comprensión en la manera de probar y en el tratamiento de HCV. La mayoría de participantes expresó temor del tratamiento y los efectos secundarios, 88% aceptaron probar del RNA de HCV y 78% expresaron comenzar tratamiento con la mayoría siendo los pacientes infectado crónicamente. Las limitaciones del estudio e implicaciones son discutidas.

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Glossary

HCV antibodies: These are gamma globulin proteins produced by the body's immune system in response to exposure to hepatitis C virus in the blood.

HCV genotype: It is the genetic constitution of the HCV cell, in which there are six genotypes and many subtypes within each genotype.

HCV quantitative viral load: It is a serological marker, which measures the severity of a hepatitis C viral infection by calculating the amount of virus in the blood, and is indicative of chronic infection.

Hepatitis C virus infection (HCV): It is a blood-borne infectious disease caused by the hepatitis C virus affecting the liver, which is often initially asymptomatic, but can progress to chronic infection causing fibrosis, cirrhosis, and liver failure.

Methadone: It is a synthetic opioid used as daily maintenance for patients recovering from opioid addiction.

Methadone maintenance treatment (MMT) clinic: It is a medical clinic operated under federal regulation for the treatment of patients with opioid dependence.

Opioid: It is a chemical that works by binding to the opioid receptors in the central nervous system inducing analgesic effects, for which prolonged use can lead to physical and psychological dependence.

Pegylated interferon: It is a chemotherapeutic medication used in the treatment of hepatitis C virus infection.

Ribavirin: It is an anti-viral medication using in conjunction with pegylated interferon in the treatment of hepatitis C virus infection.

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