# Attitudes towards Hepatitis C and Treatment Willingness in Injection Drug Users: A Follow-up Interview Study

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## Abstract

Many injection drug users are infected with hepatitis C virus (HCV), yet few are treated. With opiate maintenance treatment, expected life length increases, and the incitement increases to treat HCV in order to avoid long term complications. The aim of the present study was to investigate attitudes towards HCV and HCV treatment willingness among opiate-dependent injection drug users at Malmö needle exchange program, through interviews just before entering opiate maintenance treatment and after 6 months in opiate maintenance treatment. Heroin-dependent injection drug users were recruited from Malmö needle exchange program October 2011 – April 2013. They had a structured baseline interview (N=83), led by social workers. After 6 months, all patients who successfully entered opiate maintenance treatment and were still enrolled (N=56) had a follow-up interview. Correlations with treatment willingness were calculated using Pearson's Chi-Square test. Change over time was determined by McNemar Test. A majority at both baseline and follow-up wanted more information about HCV, but HCV-positive subjects did not feel affected by their HCV status. No significant change in treatment willingness was found after 6 month in opiate maintenance treatment, neither were any factors significantly associated with treatment willingness found. We conclude that there is need for inclusion of more information about and easy referral to HCV therapy as part of opiate maintenance treatment.

**Keywords:** Needle exchange; Hepatitis C; Treatment motivation; Opiate maintenance treatment

## Introduction

The prevalence of hepatitis C virus (HCV) among injection drug users (IDUs) varies greatly around the world from 36% to 95% [1-6]. At the needle exchange program (NEP) in Malmö, 91% tested positive for HCV 1990-1993, and in the same study HCV infection kept spreading despite free access to clean injection tools. The prevalence 1997-2005 at the same NEP was 60% [7]. The HCV incidence at Malmö NEP has recently been decreasing; however, the prevalence is still high. In 2013, the HCV prevalence among new participants at the NEP was 46% in men and 86% in women.

Complications of HCV infection include hepatic cirrhosis and hepatocellular cancer (HCC). An estimated 10-15% of HCV infected patients will develop HCC within 20 years. Virtually all HCCs develop from cirrhotic livers, with an annual rate of 1-4% [8]. Around 15-25% will heal spontaneously within one year after infection [8].

Hepatitis C is commonly treated with interferon therapy for 6-12 months [9], however new interferon-free treatment regimens with less side effects have been evolving lately. Active injection drug use is usually considered a contraindication to HCV therapy due to high risk of reinfection [10], but also non-injected drug administration is a relative contraindication because of risk for poor treatment compliance. These regulations are however discussed. For example, there was no significant difference in adherence to HCV treatment between those with a longer or shorter period of abstinence before initiating treatment in a study with 71 methadone maintained patients [11]. In one study, 26 patients maintained on heroin received antiviral treatment. Despite a high rate of concomitant drug use, co-morbidity and treatment side-effects, the adherence rate was 92%, with 20 patients achieving end-of-treatment viral response and 18 a sustained viral response [12]. History of mental illness is often regarded as a contraindication to treat HCV infection, but several studies have concluded that psychiatric co-morbidity does not influence treatment adherence negatively [11,13,14]. However, depression commonly develops or aggravates during interferon-α treatment, making psychosocial support important [12].

For heroin dependence, opiate maintenance treatment (OMT) with methadone or buprenorphine is well established and evidence based [15]. Due to more patients enroll in OMT, fewer deaths occur from heroin overdose, and with a longer

life expectancy HCV will presumably become a larger source of morbidity and mortality [16,17], and has thus come to gain interest from researchers.

The percentage of patients in OMT having HCV treatment is low, while interest in treatment has been shown to be relatively high. Among HCV infected patients attending opioid substitution programs or community health centres in Australia and Canada, 13% and 16% had received HCV treatment [18,19].

In a study from an opiate dependence treatment program in San Francisco (N=110), 34% of the patients knew about HCV treatment, and men were five times more likely than women to know of some HCV treatment. Fifty-four percent of the sample became "definitely interested" in HCV treatment after being informed about risks and benefits, why methadone programs were stressed as important in increasing access to HCV treatment through educating patients about treatment options [20]. Among 100 self-reported HCV-positive current IDUs in Sydney, the knowledge about HCV treatment was poorer than the knowledge about HCV infection. Between 70 and 80% of the IDUs reported that they would consider HCV treatment when informed about its' requirements and side effects. The authors conclude that the findings support the development of specific education programs regarding HCV treatment for current IDUs [21].

Willingness to receive HCV treatment among patients in OMT has been associated with not being co-infected with HIV, not having injected drugs recently and experiencing symptoms of HCV infection, and those not willing have reported lack of information of HCV and treatment of the infection, absence of symptoms and perceived side effects as reasons [18]. A qualitative, Australian study on 77 drug users currently or recently in drug treatment (mostly OMT) identified some barriers to HCV treatment; lacking knowledge and awareness of HCV and treatment options; having heard stories about treatment side effects; and low interest in HCV treatment in those not bothered from HCV-related symptoms [22].

A speculation that has been discussed earlier [21] is that HCV is not of great concern for active IDUs whose lives are often chaotic and shaped by short term needs for money, drugs or shelter, but that physical health including chronic viral infections becomes more important when enroll in OMT. However, no studies investigating the effect of OMT on HCV treatment willingness were found. Motivational interviewing as a possible way into HCV treatment for patients in OMT has been evaluated in a pilot study (N=4) from Israel [23], but we have not found any large scale studies on this subject.

Given the background of OMT increasing the incitements for HCV treatment from an expected survival point of view, we wanted to investigate the attitudes towards HCV and HCV treatment among IDUs. The purpose of this study was firstly to assess the *attitude towards HCV* among heroin dependent persons at Malmö NEP starting OMT. The attitudes included

perceptions about routes of contamination, course of the disease and treatment, but also wish for more information and concern about HCV infection. A second aim was to investigate the level of treatment willingness and how the attitudes above correlate to *willingness to start HCV treatment*. Additionally we wanted to assess whether age, gender, addiction severity, having overdosed or seen another person overdosing, psychiatric illness and suicide attempts had any impact on treatment willingness. We hypothesized that recruitment from the NEP to OMT would improve the awareness of HCV and the willingness to start HCV treatment.

## Materials and Methods

The study was based on structured interviews conducted among IDUs recruited at the NEP in Malmö, Sweden from October 2011 to April 2013 with a five months interruption due to preparation of new premises. The study was part of a larger randomized controlled trial, Malmö Treatment Referral and Intervention Study (MATRIS), aiming to refer patients at Malmö NEP with heroin as their main drug to evidence based OMT.

Malmö NEP opened in 1987 and has 700-1,000 visitors annually. More than 4,500 persons have enrolled since the start, and around 75% of participants are male. Prerequisites for enrolment in the NEP are self-reported injection drug use, age $\geq$ 20 years, signs of recent venepuncture, and consent to HIV testing [7]. The injected drugs in Sweden are mainly amphetamine and heroin, and among the population at Malmö NEP amphetamine is traditionally the most common main drug, followed by heroin [24]. However, recently, internal data from the NEP indicate that heroin has become the most common main drug at the NEP – in 2013, 51% reported opiates compared to 48% stimulants.

Potential participants to MATRIS and to this study were recruited from Malmö NEP. Inclusion criteria were having heroin as main drug at the NEP and being resident in the Skåne County. There was no systematic selection within the group with heroin dependence. According to preliminary data from a post hoc study of attrition and feasibility from MATRIS made by our group, the referral method was significantly more likely to succeed in older patients and patients attending the NEP more frequently.

Patients were considered eligible if they were enrolled in the NEP and had visited the NEP at least twice, the latter in order to avoid bias from patients enrolling the NEP solely to be included in this study. For inclusion, patients also had to show identification. Exclusion criteria were inability to understand Swedish and give informed consent; severe psychiatric instability including risk of suicide or homicide; current OMT; minimum time exclusion from OMT (the first three months after exclusion from an OMT program, as stated by the Swedish legislation), or documented opiate dependence for less than one year (to sort out those who did obviously not meet the

requirements for OMT in Sweden).

Patients willing to participate in the study had a baseline interview (N=83) within a week. The baseline interviews were conducted by social workers (the 3rd and 4th authors) trained in case management, and carried out at the NEP. The interview included 20 questions about HCV status, whether the responders had undergone treatment for HCV infection, knowledge about routes, course and treatment of the infection, and attitude towards HCV infection. Most questions were yes/no-questions or multiple choice questions. The baseline variables used in the statistical analysis were substance use variables, demographic data and variables related to clinical severity: Use in the past 30 days of heroin, methadone, Subutex/Suboxone, other opiates, alcohol, benzodiazepines, cocaine, amphetamine, and cannabis, respectively; age; gender; use of psychiatric medication; suicide attempts; and having had an opiate overdose.

The participants were then assessed by a doctor to see whether they fulfilled the requirements for substitution treatment (see above). After 6 months, all patients who successfully entered OMT and who were still enrolled (N=56) had a follow-up interview concerning HCV, with the HCV-specific questions identical to the ones asked at baseline, and carried out by the same interviewers.

Before the baseline interview, the respondent received oral and written information about the study, and signed a form for written informed consent. No financial compensation was offered for participation in the study. The study was reviewed and approved by the regional Ethics Committee of Lund University, Sweden (file number 2011/450).

All statistical analyses were performed using SPSS version 21. Correlations between treatment willingness and variables from the interview at either baseline or follow-up were calculated using Pearson's Chi-Square test. Change over time from baseline to follow-up was determined by McNemar Test. P-values of <0.05 were considered statistically significant.

## Results

### Population characteristics

Out of 83 patients enrolled in the baseline interview, 62 (75%) were male and the mean age was 37.8 years. Fifty-six (67%) answered the 6-month follow-up interview and the remaining 27 had been excluded, decided to discontinue participation or had not participated long enough to be interviewed for the follow-up.

When asked for HCV status at baseline, 66 (80%) reported positive, 15 (18%) negative and 2 (2%) did not know. Forty-six (70%) reported that they had been diagnosed at the NEP. Out of the 66 patients who reported being positive for HCV at baseline, 15 (23%) reported having been further assessed for this, 46 (70%) had not and 5 (8%) did not know. Two subjects (3%) reported having received treatment for HCV infection. One of these patients was still enrolled at the 6-month follow-up and then reported not having received any HVC treatment. At follow-up (N=56), the reported HCV status was positive in 43 cases (77%), negative in 7 cases (12%) and uncertain in 6 cases (11%).

### Attitudes towards hepatitis c at baseline and follow-up

Fifty-six persons participated in both the baseline and the follow-up interviews. The number of patients who reported having some knowledge about HCV treatment changed from 75% at baseline to 84% at follow-up (p=0.27). At baseline the sources of information reported was acquaintances (70%), the health care system (33%), the NEP (33%) and TV, radio and newspapers (9%).

Hepatitis C was conceived potentially deadly by 45 (80%) and 49 (88%) at baseline and follow-up respectively (p=0.29). At baseline 40 persons (71%) believed that HCV infection could or sometimes could heal spontaneously, compared to 47 (84%) at follow-up (p=0.02). Twenty-two (39%) and 32 (57%) at baseline and at follow-up respectively, believed that the infection could or could sometimes heal when discontinuing drug use (p=0.04). The belief that treatment always cures HCV infection was 14% at baseline and 18% at follow-up (p=0.77). The patients were asked about whether or not various routes of infections were correct or incorrect (Table 1), and there was no statistically significant difference between the answers at baseline and follow-up.

Thirty-three subjects (59%) at baseline – and the same number at follow up, 33 (59%) – wanted more information about HCV (p=1.00).

Of the 43 persons who reported being HCV positive at follow-up, 36 (83%) did not think their infection affected their lives at baseline, compared to 37 (86%) at follow-up (p=1.00). Talking to friends and family about HCV was reported in 3 (7%) cases at baseline and in 6 (14%) at follow-up, the remaining did not or not very often (p=0.36). Changes from baseline to follow-up are presented in Table 2.

### Treatment willingness

When the 66 persons who reported being HCV positive at baseline were asked whether they wished to receive HCV treatment, 7 (11%) were willing now, 45 (68%) later, 5 (8%) were unwilling and 9 (14%) were uncertain. At follow-up, among the 43 persons who reported positive HCV status, 6 (14%) wanted

| Variable perceived a route of HCV infection | Baseline $N_{Yes\,vs\,no}$ (%) | Follow-up $N_{Yes\,vs\,no}$ (%) | p-value |
|---|---|---|---|
| Unprotected sex | 26 (46%) | 22 (39%) | 0.42 |
| Snorted cocaine | 3 (5%) | 8 (14%) | 0.18 |
| Blood | 56 (100%) | 55 (98%) | 1.00 |
| Shared needles | 56 (100%) | 54 (96%) | 1.00 |
| Kisses, saliva | 7 (13%) | 7 (13%) | 1.00 |
| Touch | 1 (2%) | 2 (4%) | 1.00 |
| Shared injection tools (except needles) | 53 (95%) | 49 (88%) | 0.29 |

N=56 at both baseline and follow-up. P-value calculated with McNemar test.
**Table 1:** Perceptions of routes of HCV infection, change from baseline to follow-up.

treatment now, 24 (56%) later, 6 (14%) were unwilling and 6 (14%) were uncertain. When categorizing willingness now and later as "yes" and unwillingness and uncertainty as "no", no significant change over time in treatment willingness could be shown among the 43 persons participating at both baseline (N=33, 77%) and follow-up (N=30, 70%) (p=0.18).

At baseline, 5 (8%) of the 66 patients positive for HCV did not want treatment for their infection. When correlating treatment willingness and factors from the baseline- and follow-up questionnaires concerning attitudes towards HCV, that we hypothesized would make the patients more inclined to treat their HCV infection, no significant correlations were found (Table 3).

When correlating use of heroin, methadone, buprenorphine (Subutex/Suboxone), other opioids, alcohol, benzodiazepines, cocaine, amphetamine and cannabis during the last 30 days with treatment willingness, none of them showed to be statistically significant. Neither did age, gender, use of psychiatric medication, suicide attempts, or having had at least one opiate overdose have a significant correlation with treatment willingness.

## Discussion

In this study 80% reported positive for HCV at baseline, which is corresponding with previous studies [1-6]. The NEP has a great role in diagnosing these as 70% of the HCV positive patients reported that they had been diagnosed at the NEP. The percentage of patients who reported having received treatment (3%) was lower than that of studies from Canada and Australia,

| Variable | Baseline (N$_{total}$=56) N$_{Yes vs no}$ (%) | Follow-up (N$_{total}$=56) N$_{Yes vs no}$ (%) | p-value |
|---|---|---|---|
| Belief in spontaneous healing | 40 (71%) | 47 (84%)[1] | 0.02* |
| Belief that the infection heals when discontinuing drug use | 22 (39%) | 32 (57%) | 0.04* |
| Belief that HCV infection may be deadly | 45 (80%) | 49 (88%) | 0.29 |
| Belief that treatment always cures HCV infection | 8 (14%) | 10 (18%) | 0.77 |
| Holding some knowledge about treatment | 42 (75%) | 47 (84%) | 0.27 |
| Wanting more information about HCV | 33 (59%) | 33 (59%)[2] | 1.00 |
| | | | |
| **Variable concerning HCV positive persons** | **Baseline (N$_{HCV}$=43) N$_{Yes vs no}$ (%)** | **Follow-up (N$_{HCV}$=43) N$_{Yes vs no}$ (%)** | **p-value** |
| HCV affecting life situation | 4 (9%)[3] | 5 (12%)[1] | 1.00 |
| Talking to friends/relatives about HCV | 3 (7%)[3] | 6 (14%)[2] | 0.36 |
| | | | |
| 1) N$_{missing}$ = 1. 2) N$_{missing}$ = 2. 3) N$_{missing}$ = 3. | | | |

N=56 at baseline and follow-up. Persons reporting HCV positive at follow-up N=43 at baseline and follow-up. Missing values coded as No. P-value calculated with McNemar test.* = statistically significant, p<0,05

**Table 2:** Change in attitude towards HCV from baseline to follow-up.

| Variable | Baseline (N$_{total}$=83) | | Follow-up (N$_{total}$=56) | |
|---|---|---|---|---|
| | N$_{Yes vs no}$ (%) | p-value | N$_{Yes vs no}$ (%) | p-value |
| Belief in spontaneous healing | 64 (77%) | 0.56 | 47 (84%)[1] | 0.72 |
| Belief that the infection heals when discontinuing drug use | 33 (40%) | 0.10 | 32 (57%) | 0.76 |
| Belief that HCV infection may be deadly | 67 (81%) | 0.85 | 49 (88%) | 0.89 |
| Belief that treatment always cures HCV infection | 10 (12%) | 0.43 | 10 (18%) | 0.25 |
| Holding some knowledge about treatment | 64 (77%) | 0.48 | 47 (84%) | 0.37 |
| Wanting more information about HCV | 45 (54%)[1] | 0.25 | 33 (59%)[2] | 0.08 |
| | | | | |
| **Variable concerning HCV positive persons** | **Baseline (N$_{HCV}$=66)** | | **Follow-up (N$_{HCV}$=43)** | |
| | N$_{Yes vs no}$ (%) | p-value | N$_{Yes vs no}$ (%) | p-value |
| HCV affecting life situation | 8 (12%) | 0.12 | 5 (12%)[1] | 0.63 |
| Talking to friends/relatives about HCV | 4 (6%) | 0.85 | 6 (14%)[2] | 0.44 |
| | | | | |
| 1) N$_{missing}$ = 1. 2) N$_{missing}$ = 2. | | | | |

**Table 3:** Potential factors associated with treatment willingness at baseline and follow-up.

where the numbers were 16% and 13% respectively [18,19].

A majority of the patients wanted treatment for HCV later, but the number wanting treatment promptly was low at both baseline and follow-up. Treatment willingness did not differ significantly between baseline and follow-up. At baseline 68% reported wanting treatment later, possibly indicating that they want treatment in order to avoid later complications (cirrhosis and hepatocellular cancer), but not now, potentially while they do not have symptoms. It is difficult to compare these results with previous research, since we haven't found any information about interest in HCV treatment promptly versus later or not at all. Cross tabulating treatment willingness with factors that might make the patients more inclined to treat their HCV infection gave no significant results. There was, however, a trend indicating a positive association between treatment willingness and believing that HCV infection heals when discontinuing drug use (p=0.10 at baseline) and wanting more information about HCV (p=0.08 at follow-up).

In previous research, reasons for patients in OMT not wanting HCV treatment are mainly having heard stories about side effects; absence of symptoms; and lack of information about treatment options [18,22]. These reasons might be applicable to our results: The number of patients reporting knowing something about HCV treatment increased significantly from baseline to follow-up six months later. The most common source of information was acquaintances (70% at baseline). One

hypothesis is that false information is circulating among IDUs and that patients may therefore believe they know things that are actually incorrect. Another theory is that the actual knowledge isn't increasing among those enrolled in OMT, but that awareness about health matters increases overall. Interestingly, among the patients participating at both baseline and follow-up were, at follow-up there were more responses suggesting the notion of HCV as a not so serious disease, although this was not significant (Table 4). A majority (59% at both baseline and follow-up) wanted more information about HCV, indicating that the health care system, especially the NEP and OMT facility, can potentially improve information to patients and offering treatment.

With so many HCV infected IDUs, being infected is in many cases considered more or less normal. That, in combination with lack of symptoms, and having other more acute worries, such as economy, debts, psychiatric illness and other addictions, is likely to be reasons why HCV infection is not a priority for these patients, as suggested by previous research [21]. At both baseline and follow-up, 88% did not think HCV infection affected their lives, which is likely to be part of the explanation why so few wanted treatment promptly. Few patients talked to their friends and family about their HCV, suggesting that the infection that does not affect their lives is not worth talking about. Still, over 80% considered HCV a potentially deadly disease, and 60% wanted more information about HCV, which indicates that IDUs are not unaware of or indifferent to HCV.

The results from this study indicate that transferring active drug users to OMT is not enough to encourage treatment of HCV. The patients are interested in more information, and also HCV treatment later, but it doesn't seem to be of high priority. Currently, the treatment is demanding for the patient and is principally not an option if there is an ongoing non-injection substance abuse, which would probably exclude some of the patients in this study from HCV therapy. However, with expected new types of treatment in the near future, maybe more persons with drug addiction will be able to undergo HCV treatment.

In current OMT service in Malmö, patients are not systematically and actively informed about HCV and HCV treatment. Introducing information (about routes of infection, complications and treatment) as an integrated part of OMT, encouraging treatment and offering easy referral to HCV therapy might make some patients more inclined to start treatment. The setting of OMT constitutes a window of opportunity to reach patients otherwise unaware or indifferent of their physical health. The purpose of OMT service is not only to treat drug dependence, but also to notify problems concerning the patients' somatic health. This could be further stressed by encouraging the individual with more information, motivational interviewing etcetera, as supported by previous research [21,22]. It is also important to create structures in the health care system which facilitates quick and easy referral from OMT to HCV treatment. One suggestion could be information or motivational interviews carried out by for example a nurse at the OMT clinic, followed by a quick transfer to a meeting with a physician specialized in infectious diseases in order to decide whether the patient is a candidate for HCV treatment.

This study has a number of limitations. First, interviews were performed when initiating opiate maintenance treatment and only six month later, possibly a period too short to show any change. Second, starting maintenance treatment is a big step in itself, so that HCV infection might have little priority in the beginning. A later follow-up would be preferable. Additionally, twenty-seven out of the 83 participants did not undergo the follow-up interview. It is not possible to rule out that these patients would have replied differently. There was, however, no significant difference between responders and non-responders at follow-up, concerning gender (p=0.65 according to Chi-Square test), HCV-status at baseline (p=0.54), treatment willingness at baseline (p=0.32) and reported knowledge about HCV treatment at baseline (p=0.51). Another limitation is that the infection is self-reported, not verified by blood samples. However, we consider the patients' notion about being infected or not as more important than actual infection since the study focuses on patients' *perceptions* about HCV and HCV treatment. Also, the sample size may be too small to have sufficient statistical power; making it difficult to draw conclusions with few results with a p-value lower than 0.05 or even close to it.

## Conclusions

In conclusion, the patients in this study were not particularly

| Variable* | $N_{Yes\ vs\ no}$ (%) | Mean (range) |
|---|---|---|
| Use of heroin in the past 30 days | 77 (93%) | |
| Use of methadone in the past 30 days | 60 (72%) | |
| Use of Subutex/Suboxone in the past 30 days | 37 (45%) | |
| Use of other opiates in the past 30 days | 33 (40%) | |
| Use of alcohol in the past 30 days | 46 (55%) | |
| Use of benzodiazepines in the past 30 days | 64 (77%) | |
| Use of cocaine in the past 30 days | 26 (31%) | |
| Use of amphetamine in the past 30 days | 36 (43%) | |
| Use of cannabis in the past 30 days | 58 (70%) | |
| Gender (male) | 62 (75%) | |
| Current use of psychiatric medication | 16 (19%)[x] | |
| Suicide attempt | 22 (27%)[x] | |
| Opiate overdose | 49 (59%)[x] | |
| Age | | 37.8 (23-67) |

* None of the variables listed was significantly associated with treatment willingness.
x) $N_{missing}$ = 14.

N=83. Missing values coded as No. P-value calculated with Chi-Square test.

**Table 4:** Potential factors correlated with treatment willingness at baseline.

worried or occupied thinking about HCV. A majority were interested in HCV treatment but not at the moment, neither at baseline nor at follow-up. Still, 59% wanted more information about HCV, which indicates that IDUs are aware of HCV. The implications from these findings is that the parts of the health care system that interferes with drug users at high risk of HCV, and OMT clinics in particular, have an important task to fulfill concerning motivating and referring these patients to HCV treatment.

## Conflicts of Interest

The authors do not have any conflicts of interest related to this paper.

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