Predictors of Loss to Follow-Up in Patients with Hepatitis C

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ABSTRACT

Background: Advancements in hepatitis C virus (HCV) treatment include rapidly changing medical management and shifting criteria for reimbursement of HCV antiviral treatment. These lead to unique challenges in maintaining patient follow up.

Methods: Retrospective chart review was used to identify risks factors for loss to patient follow up (LTFU). Patients with ambulatory visits for HCV care between March 2013 and March 2016 Beth Israel Deaconess Medical Center (BIDMC) were identified by ICD 9-10 codes. Patients were defined as LTFU if they had 1) no follow-up appointment scheduled nor kept an appointment within the prior 6 months and 2) had not been discharged nor reassigned to another provider. Logistic regression was used to assess the association between LTFU and variables related to demographics, health behavior and utilization.

Results: 256 patients were identified and 58 (23%) were LTFU. Comparing patients LTFU vs. non-LTFU, patients LTFU were younger (49 vs. 53), less likely to have Liver Center engagement (2 vs. 31%), more likely to have mild (26 vs. 16%) or undocumented (22 vs. 4%) liver fibrosis, and less likely to have achieved cure (19 vs. 62%). Patients LTFU were more likely to live either 0-9 miles or ≥35 miles from BIDMC and were more likely to have cancelled or missed their last appointment. Variables identified via univariate logistic regression (p≤0.20) were included in a multivariable model. Variables not significant included sex, race, language, education level, smoking status, HIV status, and insurance coverage. In the adjusted model, patients LTFU were less likely to be receiving HCV therapy (p<0.001) and were more likely to have an undocumented liver fibrosis stage (p=0.02). Compared to patients who lived 0-9 miles from BIDMC, patients 10-34 miles and 35-84 miles away were less likely to become LTFU, while those ≥85 miles away were more likely to become LTFU (p=0.03). Variables not significant (p>0.05) included age, injection drug use status, PCP at BIDMC, and disposition of last appointment.

Conclusion: Miles from BIDMC, lack of HCV treatment and lack of documentation of liver fibrosis stage are significant predictors of LTFU in patients engaged in HCV care. Findings are important in characterizing barriers to retention in HCV care and informing interventions to reduce LTFU.

BACKGROUND

- U.S. prevalence is 1.0-1.9% and increasing with the current "second wave" of HCV incidence in youth under age 30.
- Advancements in hepatitis C virus (HCV) treatment include rapidly changing medical management and shifting criteria for reimbursement of HCV antiviral treatment.
- These factors lead to unique challenges in maintaining patient follow up.

AIMS

1. Characterize the population of patients with diagnosed HCV seen in the Division of Infectious Diseases of BIDMC.
2. Determine if residential distance from BIDMC is significantly associated with loss to follow-up status for HCV patients when controlling for demographic, health care utilization and health status variables.

METHODS

Study location: Urban teaching hospital in Boston.

Study population: Outpatients seen in the Division of Infectious Diseases coded with hepatitis C over a three year period (March 2013 - March 2016).

Study design: Retrospective chart review of all patients with HCV with ambulatory visits in the Infectious Diseases clinic between March 2013 and March 2016. Patients were identified by ICD 9-10 codes associated with billing of their visits. Patients were categorized based on appointment history, chart review and provider input.

Statistics: Logistic regression in STATA/IC 14.1was used to assess the association between LTFU and variables related to demographics, health behavior and utilization. Variables significantly different (p≤0.20) in univariate analysis were included in multivariate analysis. Variables were considered significantly different in multivariate analysis if p≤0.05.

Variables:

Loss to follow-up: Patients were LTFU who met the following criteria:
1) had not kept an appointment within the prior 6 months
2) had no follow-up appointment scheduled
3) had not been discharged nor reassigned to another provider

Primary outcome: Residential distance from medical center
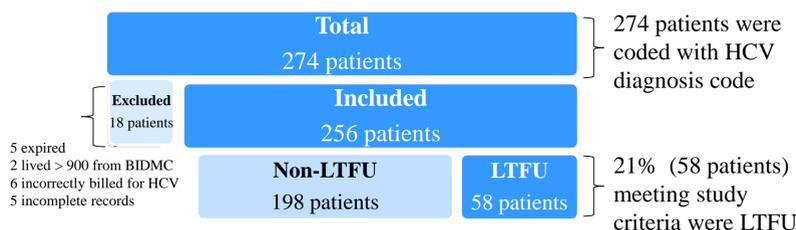

0-9 miles   Walking or public transportation
10-34 miles Less than 30 minute drive
35-84 miles 30-60 minute drive
≥85 miles   >60 minute drive

Secondary outcomes: Age, sex, race, preferred language, education level, smoking status, disposition of last appointment, PCP at BIDMC, HCV status, HIV co-infection, liver damage, intravenous drug use status, insurance coverage.

PATIENTS LTFU

Figure 1. Proportion of patients LTFU with outpatient visits
March 2013 – March 2016

Total — 274 patients
274 patients — 274 patients were coded with HCV diagnosis code

Excluded 18 patients
5 expired
2 lived > 900 from BIDMC
6 incorrectly billed for HCV
5 incomplete records

Included — 256 patients

Non-LTFU 198 patients   LTFU 58 patients — 21% (58 patients) meeting study criteria were LTFU

UNIVARIATE RESULTS

Table 1. Patient Characteristics

Demographics	LTFU n = 58 (23%)	Non-LTFU n = 198 (77%)	p-value
Residential distance from BIDMC			0.032
0-9 miles	25 (43)	79 (40)	
10-34 miles	14 (24)	82 (41)	
35-84 miles	15 (26)	33 (17)	
>85 miles	4 (7)	4 (2)	
Average age, years (mean)	49	53	0.009
HCV-Related			
HCV status			<0.001
Uncured	62 (81)	62 (31)	
On Treatment	0 (0)	13 (7)	
Cured	11 (19)	123 (62)	
Liver damage			<0.001
Sub-clinical fibrosis	15 (26)	31 (16)	
Fibrosis without cirrhosis	23 (40)	95 (48)	
Cirrhosis	7 (12)	65 (33)	
Undocumented	13 (22)	7 (4)	
Intravenous drug use			0.138
Never	18 (31)	78 (39)	
Former	33 (57)	110 (56)	
Current	7 (12)	10 (5)	
Appointment-Related			
Disposition of last appointment			<0.001
Kept	30 (52)	154 (78)	
Cancelled	5 (9)	14 (7)	
No Show	23 (40)	30 (15)	
PCP at BIDMC			0.072
Yes	16 (31)	80 (40)	
No	36 (69)	118 (60)	
Liver Center Engagement			<0.001
Yes	1 (2)	62 (31)	
No	57 (98)	136 (69)	

Patients LTFU were:
- More likely to live either 0-9 miles or ≥35 miles from BIDMC
- Slightly younger (49 vs. 53 years old)
- Less likely to have achieved cure (19 vs. 62%)
- More likely to have mild (26 vs. 16%) or undocumented (22 vs. 4%) liver fibrosis
- More likely to have cancelled (9 vs. 7%) or missed (40 vs. 15%) their last appointment
- Less likely to have Liver Center engagement (2 vs. 31%)

Patients LTFU were not significantly different (p≤0.20) from patients non-LTFU in:
- Sex
- Race/ethnicity
- Preferred language
- Education level
- Smoking status
- HIV co-infection
- Insurance coverage of HCV prescription

MULTIVARIABLE RESULTS

Compared to patients who lived 0-9 miles from BIDMC
- Patients 10-84 miles away were less likely to become LTFU
- Patients ≥85 miles away were more likely to become LTFU

Patients LTFU were:
- Less likely to be receiving HCV therapy
- More likely to have an undocumented liver fibrosis stage

Table 2. Multivariate analysis for predictors of LTFU

Demographics	OR (CI 95%)	p-value
Residential distance from BIDMC		
0-9 miles	Reference	0.031
10-34 miles	0.45 (0.19, 1.09)	
35-84 miles	0.77 (0.28, 2.14)	
>85 miles	5.96 (1.10, 32.26)	
Age, years	0.98 (0.95, 1.02)	0.279
HCV-Related		
HCV status		
Uncured	Reference	<0.001
On Treatment	0.17 (0.08, 0.37)	
Cured	1.00	
Liver damage		
Sub-clinical fibrosis	Reference	0.021
Fibrosis without cirrhosis	0.54 (0.22, 1.37)	
Cirrhosis	0.36 (0.10, 1.27)	
Undocumented	3.13 (0.70, 13.89)	
Intravenous drug use		
Never	Reference	0.652
Former	1.36 (0.62, 2.99)	
Current	0.88 (0.21, 3.62)	
Appointment-Related		
Disposition of last appointment		
Kept	Reference	0.131
Cancelled	2.03 (0.52, 7.90)	
No Show	2.21 (0.99, 4.95)	
PCP at BIDMC		
Yes	Reference	0.401
No	1.41 (0.63, 3.17)	

CONCLUSIONS

- Miles from BIDMC, lack of HCV treatment and documentation of liver fibrosis stage are significant predictors of LTFU in patients engaged in HCV care
- Findings are important in characterizing barriers to retention in HCV care and informing interventions to reduce LTFU.