

Delays in Fibrosis Staging on Worsening Liver Function



Sierra D. Sossamon, MS¹, Austin T. Jones, MPHTM², Stacey Rhodes, MD¹, Lisa Moreno-Walton MD, MS, MSCR, FAAEM¹

¹Louisiana State University Health Science Center, Section of Emergency Medicine

²Tulane University SPHTM, Department of Epidemiology

Introduction

- Hepatitis C virus (HCV) claims more American lives than the next 60 reportable infectious diseases combined.¹
- The majority of the estimated 3.5 million people infected with HCV are burdened with chronic hepatitis - a disease that leads to cirrhosis, hepatocellular carcinoma, and liver failure.²
- Following confirmatory HCV testing, a leading barrier to initiate treatment is the requirement to undergo disease staging.
- In a study of 875 patients at University Medical Center New Orleans (UMCNO) Emergency Department (ED), severe delays in transient elastography averaged 6.5 months among people with chronic HCV.³
- Our study objective was to assess delays in hepatic fibrosis staging on decline in liver function.
- We hypothesized that delays in fibrosis staging negatively impact patient outcomes, including liver function.

Methods



This is a retrospective cohort study of 904 chronically infected HCV individuals diagnosed by UMCNO ED between March 1, 2015 and August 1, 2017. Those who received subsequent hepatic fibrosis staging were included.



Exposure is defined as time from chronic HCV diagnosis to fibrosis staging. Outcomes are changes in liver function measured by AST to Platelet Ratio Index (APRI) and Fibrosis-4 (FIB4) Index.



Measures of hepatic function were collected at time of HCV screening, time of fibrosis staging, and start of HCV therapy (if achieved).

Analysis was performed using multivariable linear regression producing risk differences, adjusting for insurance and history of intravenous drug use.

Variable	Original Intervention n=904
Age, years, median	55
Race	
Asia	1
Native American/Pacific Islander	2
Black or African American	634
White	221
More than one race	28
Hispanic/Latino	3
Insurance Status	
Medicaid/LA Health Care Connections	543
Medicare	168
Private Insurance	72
Uninsured	86
Other	35
History of Intravenous Drug Use	
Yes	477
No	427

Table 1. Demographics of study participants. Study criteria includes all participants found to be chronically infected with HCV in the UMCNO ED between 2015-2017 and received fibrosis staging.

HCV Continuum of Care

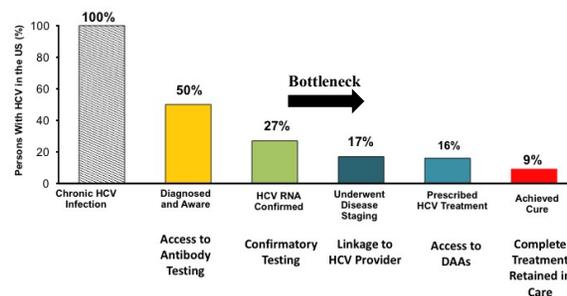


Figure 1. Hepatitis C elimination: challenges with under-diagnosis and under-treatment. DAAs are defined as Direct-acting antivirals (DAAs) which are a class of drugs used to treat hepatitis C.⁴

Results

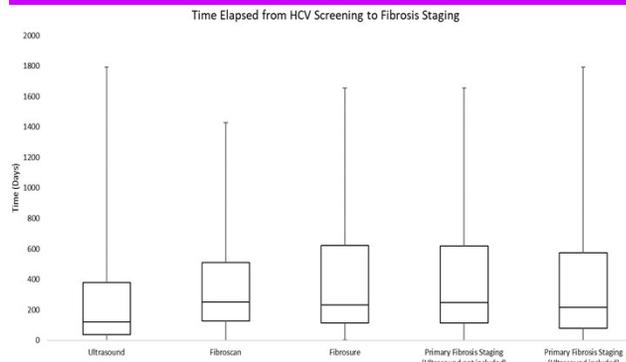


Figure 2. Time elapsed from HCV Ab screening to various methods of fibrosis staging.

Measures of Liver Function

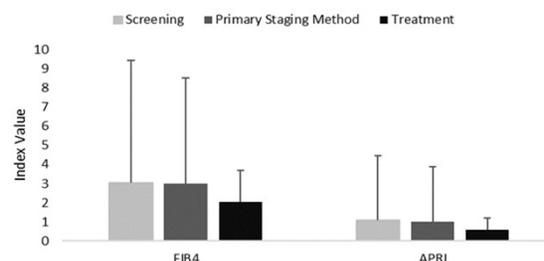


Figure 3. Delays in HCV care on hepatic function. The FIB 4 score is a non-invasive liver fibrosis assessment based on patient age, platelet count, AST and ALT values. The APRI Index (AST to Platelet Ratio Index) determines the likelihood of hepatic fibrosis and cirrhosis in patients with Hepatitis C.

Delays in Care	Unadjusted Model Risk Difference [95% CI]	P-value	Adjusted Model Risk Difference [95% CI]	P-value
APRI				
Time from Ab Screening to Fibrosis Staging	1.13 [1.01, 1.28]	0.04	1.14 [1.01, 1.28]	0.03
Time from Ab Screening to Treatment Start	1.11 [0.91, 1.35]	0.30	1.12 [0.91, 1.37]	0.28
FIB-4				
Time from Ab Screening to Fibrosis Staging	1.21 [1.10, 1.33]	<0.001	1.22 [1.11, 1.34]	<0.001
Time from Ab Screening to Treatment Start	1.11 [0.95, 1.29]	0.19	1.12 [0.96, 1.30]	0.17

Table 2. Delays in HCV care on hepatic function. Linear regression models were used to produce risk differences, reported by change per 6-month delay. Adjusted model includes history of intravenous drug use and insurance status.

Conclusions

- There was a statistically significant relationship on decrease in hepatic function with increasing delay from HCV antibody screening to fibrosis staging.
- Patients who receive RUQ ultrasound may receive fibrosis staging earlier than those staged by fibroscan or fibrovue tests.
- Relationships between delays in care on hepatic dysfunction indicates an area necessitating further clinical studies to better understand whether the requirement for fibrosis staging negatively affects outcomes for patients with HCV.

References

- Ly KN, Hughes EM, Jiles RB, Holmberg SD. Rising mortality associated with Hepatitis C virus in the United States, 2003-2013. *Clinical Infectious Diseases*. 2016;62(10):1287-1288. doi:10.1093/cid/ciw111
- Lee M, Yang H, Lu S, et al. Chronic Hepatitis C Virus Infection Increases Mortality From Hepatic and Extrahepatic Diseases: A Community Based Long-Term Prospective Study. *J Infect Dis*. 2012;206:469-477. doi:10.1093/infdis/jis385.
- Jones, A.T., Moreno-Walton, L., Okeke-Eweni, K.R., Miller, J., Soderstrum, D. and Kissinger, P. Integrating Opt-Out Hepatitis C Screening with Emergency Services for High Risk Populations. *American Journal of Tropical Medicine and Hygiene* 2019; 101:547.
- Terrault, Norah. (2019). Hepatitis C elimination: challenges with under-diagnosis and under-treatment. *F1000 Research*. 8. 54. 10.12688/f1000research.15892.1.