The association between substance use and cirrhosis measured by transient elastography (TE) in an HCV monoinfected and HIV/HCV co-infected population

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Background

About 20 to 30% of patients living with HIV in Canada are co-infected with hepatitis C virus (HCV) [1]. Co-infected individuals experience more rapid progression of liver disease and development of cirrhosis than mono-infected individuals [2]. In the management of HCV infected and co-infected patients, evaluation of fibrosis stage is critical. Transient elastography (TE) offers a non-invasive method to measure liver stiffness (scores measured in kilopascals [kPa]) which serves as a marker for fibrosis [3,4].

People with substance use, especially injection drug use, are especially at risk for HCV infection and co-infection. In Vancouver, British Columbia among people who inject drugs, HIV and HCV seropositivity are approximately 27% and 84%, respectively [5].

Objective

We sought to determine whether a history of substance use among HCV+ and HCV/HIV+ patients confers a greater risk of liver cirrhosis measured by TE.

Methods

Study Participants

HCV and HIV/HIV co-infected adults (≥ 19 years old) referred for TE at a HIV/HCV outpatient clinic were recruited from October 2013 to August 2015.

Data Collection

Clinical and demographic data were collected by patient interview and HIV/ART-related factors from the BC Centre for Excellence in HIV/AIDS Drug Treatment Program. TE was performed on an Echosens™ FibroScan® 502 device according to the manufacturer's guidelines by a certified operator [6]. Liver cirrhosis (F4) was defined as TE score ≥12.5kPa [7].

Statistical methods

Categorical variables and continuous variables were compared using Chi-squared test or Fisher's exact test and Wilcoxon rank sum test, respectively. Multivariable logistic regression modelling was used to identify factors associated with cirrhosis. Level of significance set at $p<0.05$.

Results

Table 1: Characteristics of study cohort

Total N	298
Male - N (%)	235 (78.86)
Age, years - Median (Q1-Q3)	51 (46-58)
HIV/HCV co-infection - N (%)	197 (66.11)
HIV/HBV co-infection - N (%)	26 (18.12)
Time since HIV diagnosis, years - Median (Q1-Q3)	15 (10-20)
Time since HCV diagnosis, years - Median (Q1-Q3)	12 (4-19)
Pre-DAA treatment for HCV - N (%)	54 (68.12)

Figure 1: Cirrhosis and HBV co-infection

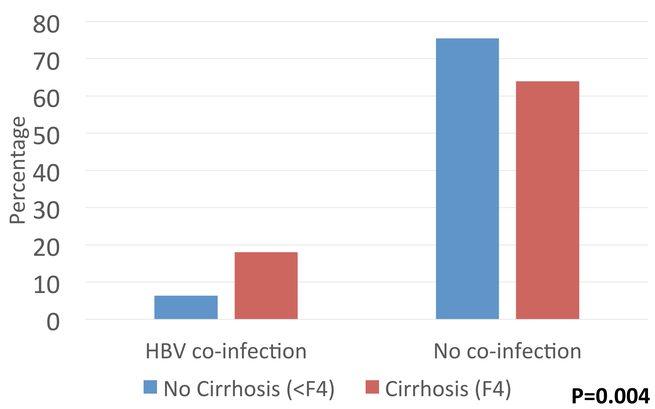

Figure 2: Cirrhosis and HCV treatment (Pre-DAA)

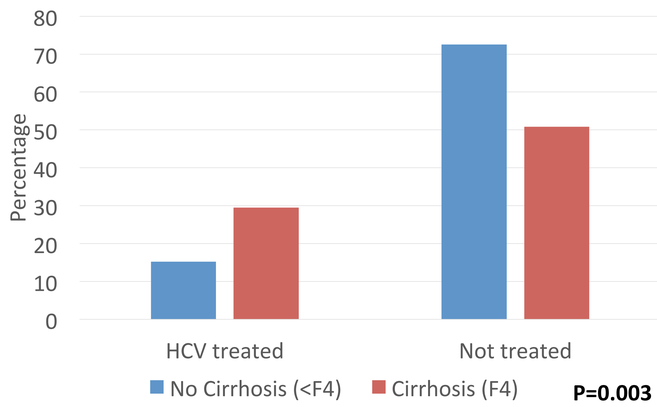

Figure 3: Cirrhosis and heroin use

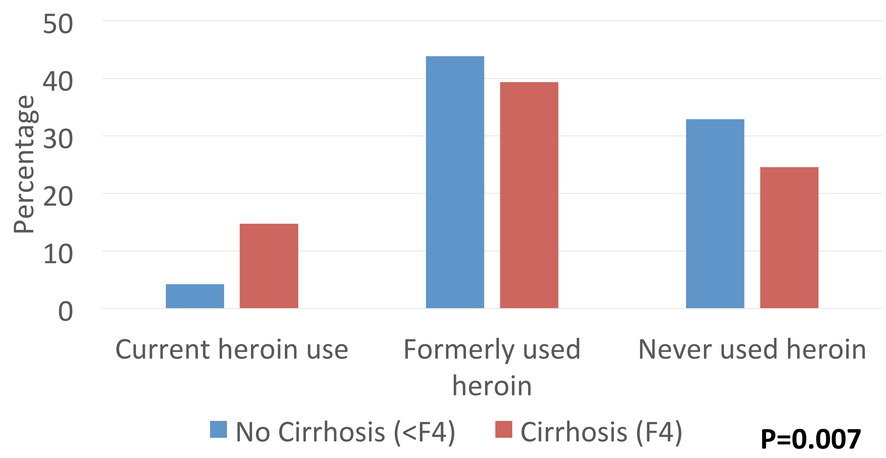

Table 2: Multivariate analysis of factors associated with cirrhosis (F4)

	Adjusted OR	95% CI
Current Heroin Use (current vs never)	8.87	2.70-29.12
Age at time of TE (per year)	1.06	1.02-1.11
HCV treated (yes vs no)	3.01	1.43-6.32
HepB co-infection (yes vs no)	3.44	1.32-8.95

In bivariate analysis, alcohol, marijuana, cocaine, crack and crystal meth were not associated with a greater risk of cirrhosis; nor was HIV coinfection (p>0.10 for all)

Conclusion

Substance use among HCV+ and HCV/HIV+ patients in this cohort was not associated with greater risk of cirrhosis with the exception of current heroin use. Cirrhosis was independently associated with older age, receipt of pre-DAA HCV treatment, and hepatitis B co-infection.

References

1. Trubnikov M., Yan P., Archibald C. Estimated prevalence of Hepatitis C Virus infection in Canada, 2011. *Canada Communicable Disease Report*. 2014; 40-19:429–436.
2. Graham CS, Baden LR, Yu E, et al. Influence of human immunodeficiency virus infection on the course of hepatitis C virus infection: a meta-analysis. *Clin Infect Dis* 2001; 33:562-9.
3. Castera L, Forns X, Alberti A. Non-invasive evaluation of liver fibrosis using transient elastography. *J Hepatol* 2008; 48:835-47.
4. de Ledinghen V, Vergniol J. Transient elastography for the diagnosis of liver fibrosis. Expert Rev Med Devices 2010; 7:811-23.
5. Hayashi K, Milloy MJ, Wood E, Dong H, Montaner JS, Kerr T. Predictors of liver-related death among people who inject drugs in Vancouver, Canada: a 15-year prospective cohort study. J Int AIDS Soc 2014; 17(1): 19296.
6. www.fibroscan.com
7. Castera L, Winnock M, Pambrun E, et al. Comparison of transient elastography (FibroScan), FibroTest, APRI and two algorithms combining these tests for liver fibrosis staging in HIV/HCV coinfected patients: ANRS CO13 HEPAVIH and FIBROSTIC Collaboration. *HIV Med* 2014; 15;30-39.

Conflict of Interest Disclosure: I have no conflicts of interest
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