Real-World Effectiveness of Sofosbuvir-based Regimens for Treatment of Hepatitis C Genotypes 1-3: BC Hepatitis Testers Cohort (BC-HTC)

BC Centre for Disease Control
An agency of the Provincial Health Services Authority

Maryam Darvishian[1, 2], Mei Chong[1], Alnoor Ramji[3], Eric M. Yoshida[3], Zahid Butt [1, 2], Stanley Wong [1, 2], Amanda Yu[1], Nazrul Islam [1, 2], Hasina Samji[1, 2], Nuria Chapinal[1], Darrel Cook[1], Maria Alvarez[1], Mark Tyndall[1, 2], Mel Krajden[1, 2], Nav

[1] BC Centre for Disease Control, Vancouver, BC; [2] University of British Columbia, Vancouver, BC; [3]BC Cancer Agency, Vancouver, BC, Canada.

Introduction

About 71 million people have chronic hepatitis C (HCV) worldwide and the majority of individuals with chronic infection are at high risk of liver-related morbidity (e.g. cirrhosis and hepatocellular carcinoma) and mortality.

Introduction of sofosbuvir-based regimens from December 2013, such as sofosbuvir/ledipasvir (SOF/LDV) combination therapy against HCV genotype 1 and sofosbuvir/ribavirin (SOF/RBV) combination therapy against HCV genotype 3 resulted in high sustained virological response (SVR) rate.

Despite the high efficacy of sofosbuvir-based regimens in trials, multiple factors namely treatment duration, viral load, and patient's characteristics such as presence of cirrhosis and history of previous HCV treatment could affect SVR rate .

The current evidence is mainly from trials and limited population based real-world data is available. So in this study we used data from the BC Hepatitis Testers Cohort (BC-HTC) to evaluate the real-world effectiveness of sofosbuvir-based regimens against HCV genotype 1 (GT1), 2 (GT2), and 3 (GT3) among a diverse HCV-infected population.

Methods

The BC Hepatitis Testers Cohort (BC-HTC):
Includes all individuals tested for HCV or HIV at the BCCDC Public Health Laboratory, and all cases of HBV, HCV, HIV, and active tuberculosis reported by public health since 1990. Linked with BC Ministry of Health administrative data (medical visits, hospitalizations, prescription drugs), cancer diagnoses and deaths. Matching based on personal health number.

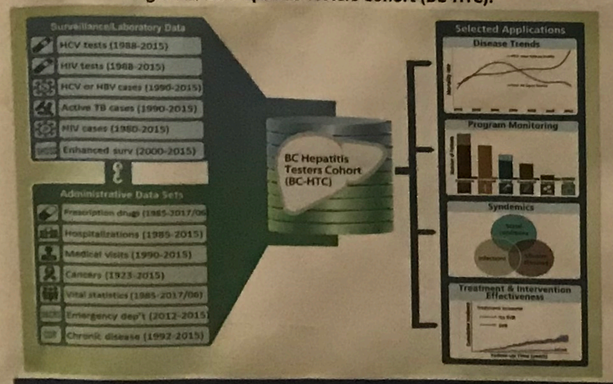
Population and exposure:
All individuals who filled at least one prescription for HCV treatment until June 31, 2017 in routine clinical care in BC and had at least 24 weeks of follow-up in PharmaNet to assess treatment completion and 12 weeks of follow-up to assess SVR.

Treatment regimens
GT1: ledipasvir/sofosbuvir (LDV/SOF), ledipasvir/sofosbuvir+ribavirin (LDV/SOF/RBV), and sofosbuvir/peginterferon + ribavirin (SOF/PEG/RBV).
GT2 and GT3: sofosbuvir + ribavirin (SOF/RBV) ,SOF/PEG/RBV, and Velpetasvir + Sofosbuvir (SOF/VEL).

Outcome
Sustain virological response (SVR) assessed at 12 weeks post treatment based on intention to treat approach.

Statistical methods: Logistic regression was used to identify factors that were associated with SVR rate.

Figure 1. BC Hepatitis Testers Cohort (BC-HTC).

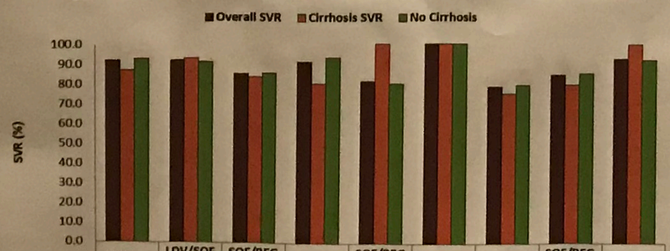


Results

Table 1. Baseline characteristics of study participants by genotype and treatment regimen.

	Genotype 1			Genotype 2			Genotype 3		
	LDV/SOF N = 2952	LDV/SOF /RBV N = 36	SOF/PEG /RBV N = 73	SOF+RBV N = 278	SOF/PEG /RBV N = 16	SOF/VEL N = 27	SOF+RBV N = 415	SOF/PEG /RBV N = 60	SOF/VEL N = 55
	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)
Birth cohort: 1945-1964	2327(78.8)	32(88.9)	61(83.6)	217(78.06)	13(81.2)	22(81.5)	310(74.7)	46(77.7)	42(76.4)
Sex, Male	2022(68.5)	31(86.1)	58(79.4)	182(65.5)	6(37.5)	15(55.6)	264(63.6)	49(81.7)	34(61.8)
Age (years)									
≤49	417(14.1)	3(8.3)	9(12.3)	32(11.5)	2(12.5)	1(3.7)	79(19.0)	11(18.3)	10(18.2)
50-59	1071(36.3)	11(30.6)	38(52.0)	88(31.6)	7(43.7)	14(51.5)	180(43.4)	31(51.7)	24(43.6)
≥60	1464(49.6)	22(61.1)	26(35.6)	158(56.8)	7(43.7)	12(44.4)	156(37.6)	18(30.0)	21(38.2)
Median [IQR]	59 [54-63]	61 [54-63]	59 [55-61]	61 [56-65]	58.5 [56-65]	59 [55-66]	57 [51-61]	58 [52-60]	58 [53-61]
Treatment duration									
<8 weeks	23(0.7)	0(0.0)	0(0.0)	4(1.4)	1(6.2)	0(0.0)	9(2.2)	1(1.7)	0(0.0)
8 weeks	795(26.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	7(1.7)	1(1.7)	0(0.0)
12 weeks	1508(51.1)	20(55.6)	58(79.4)	207(74.5)	12(75.0)	24(88.9)	10(2.4)	29(48.3)	51(92.7)
24 weeks	626(21.2)	16(44.4)	15(20.5)	67(24.1)	3(18.8)	3(11.1)	389(93.7)	29(48.3)	4(7.3)
HCV-RNA viral load									
<236494 (Q1)	828(28.0)	12(33.3)	24(32.0)	110(39.6)	5(31.2)	14(51.8)	172(41.4)	27(45.0)	18(32.7)
236494- 956819(Q2)	690(23.4)	9(25.0)	14(19.2)	58(20.9)	4(25.0)	4(14.8)	91(21.9)	9(15.0)	16(29.1)
956819-2612530(Q3)	731(24.7)	8(22.2)	19(26.0)	52(18.7)	1(6.2)	4(14.8)	67(16.1)	14(23.3)	7(12.4)
≥2612530(Q4)	703(23.8)	7(19.4)	16(21.9)	58(20.9)	6(37.5)	5(18.5)	85(20.5)	10(16.7)	14(25.4)
Diabetes	311(10.5)	6(16.7)	6(8.0)	41(14.7)	3(18.7)	3(11.1)	49(11.8)	4(6.7)	5(9.1)
Cirrhosis	393(13.3)	14(38.9)	12(16.0)	45(16.2)	1(6.2)	2(7.4)	81(19.5)	5(8.3)	5(9.1)
DC	194(6.6)	7(19.4)	5(6.8)	21(7.5)	0(0.0)	2(7.4)	44(10.6)	2(3.3)	2(3.6)
HBV	210(7.1)	1(2.8)	3(4.1)	16(5.8)	0(0.0)	1(3.7)	31(7.5)	5(8.3)	3(5.4)
HIV	273(9.2)	3(8.3)	5(6.8)	13(4.7)	0(0.0)	2(7.4)	46(11.1)	4(6.7)	4(7.3)
Problematic alcohol use	774(26.2)	8(22.2)	17(23.3)	50(18.0)	1(6.2)	6(22.2)	137(33.0)	18(30.0)	12(21.8)
PWID/OST	879 (29.8)	9(25)	27(18.1)	66(23.7)	2(12.5)	2(7.4)	185(44.6)	14(23.3)	23(41.8)
Major mental illness	879(29.8)	11(30.6)	16(21.9)	84(30.2)	3(18.7)	5(18.5)	169(40.7)	19(31.7)	17(30.9)
Elixhauser comorbidity	1917(64.9)	25(69.4)	48(65.7)	180(64.7)	9(56.2)	14(51.8)	306(73.7)	38(63.3)	28(50.9)
Treatment experienced	706(23.9)	25(69.4)	23(31.5)	74(26.6)	3(18.7)	3(11.1)	157(37.8)	24(40.0)	12(21.8)
Materially most deprived (Q5)	664(23.0)	7(20.6)	12(16.4)	60(21.7)	1(6.2)	2(9.0)	112(27.5)	15(25.0)	10(18.9)

Figure 2. Overall and cirrhosis stratified SVR rates (%) for GT1 GT2 and GT3.



	LDV/SOF	LDV/SOF /RBV	SOF/PEG /RBV	SOF+RBV	SOF/PEG /RBV	SOF/VEL	SOF+RBV	SOF/PEG /RBV	SOF/VEL
	Genotype 1			Genotype 2			Genotype 3		
Overall SVR	92.0	91.7	84.9	91.0	81.3	100.0	78.8	85.0	92.7
Cirrhosis SVR	87.0	92.9	83.3	80.0	100.0	100.0	75.3	80.0	100.0
No Cirrhosis	92.8	90.9	85.3	93.1	80.0	100.0	79.6	85.5	92.0

Results

Table 2. Predictors of SVR in multivariate l

	Genotype 1			
	LDV/SOF	SOF/PEG+		
Age (years)				
50-59 (ref. ≤49)	1.06 (0.68-1.64)	-		
60+ (ref. ≤49)	1.08 (0.69-1.64)	-		
Sex				
Male (ref. Female)	**0.37 (0.25-0.54)***	-	0.44 (0.[illegible]1.23)	0.[illegible]2 (0.1[illegible]0.62)*
Treatment duration				
<8 weeks (ref. 12 weeks)	**0.03 (0.01-0.07)***	-	**0.11 (0.01-0.93)***	**0.04 (0.00-0.47)***
8 weeks (ref. 12 weeks)	0.81 (0.58-1.15)	-	-	-
24 weeks (ref. 12 weeks)	0.90 (0.60-1.34)	**0.17 (0.04-0.11)***	0.82 (0.30-2.25)	2.21 (0.60-8.16)
Cirrhosis				
Yes (ref. No)	**0.58 (0.39-0.85)***	2.11 (0.30-14.65)	**0.33 (0.11-0.93) ***	0.75 (0.40-1.42)
Diabetes				
Yes (ref. No)	0.88 (0.58-1.34)	-	-	-
Illicit drug use				
Yes (ref. No)	0.94 (0.67-1.32)	-	-	-
Problematic alcohol use				
Yes (ref. No)	1.01 (0.72-1.43)	-	-	-
Previous HCV treatment				
Yes (ref. No)	1.10 (0.76-1.60)	-	0.71 (0.28-1.79)	0.94 (0.55-1.60)
Elixhauser comorbidity index				
Yes (≥1) (ref . No (0))	**0.69 (0.49-0.98)***	-	-	-

Conclusions

- In this real-world cohort, high SVR rates with **LDV/SOF ± RBV** among GT1, and **SOF/VEL** among GT2 and GT3 infected patients and lower SVR with **SOF/RBV** and **SOF/PEG/RBV** among GT1, GT2 and GT3 are similar to the data reported from clinical trials and other real-world cohorts.
- Male gender, presence of cirrhosis, and treatment duration mainly less than 12 weeks were significant negative predictors of SVR.
- These data confirm the **high effectiveness** of **LDV/SOF** among GT1 and **SOF/VEL** among GT2 and GT3 patients in a real-world setting, and highlight the **sub-optimal** SVR of **SOF/RBV** and **SOF/PEG/RBV** for GT1, GT2, and GT3.

Disclosure

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For more information please contact Dr. Maryam Darvishian (maryam.darvishian@bccdc.ca)

Purpose

Peers4Wellness is an Indigenous peer-led con
research study. This work explores the feasibi
peer navigation as a springboard for building
model for supportive HCV care. The focus of t
involves Indigenous women (cis- and trans-ge
settings in British Columbia (BC), Vancouver ar

Background

The rates of Hepatitis C virus (HCV) are five time
higher among First Nations, Inuit and Métis (FNI
Indigenous peoples of Canada, compared to the
Indigenous counterparts. Nevertheless, FNIM ar
represented in HCV health care programs. Peer n
present a potential approach to address the gap
care for FNIM. This potential is underlined by two
peer navigation is emerging as promising practice
promoting health care engagement in a number
including HIV, and 2) the concept of peer navigati
relevant from an Indigenous perspective due to it
communal elements.

Rationale

The current landscape of peer navigation research
practice lacks an Indigenous focus as well as HCV f
study draws on peer navigation as a conceptual ap
provide an Indigenous way for supportive HCV care
overall goal of addressing the Indigenous under-en
with HCV health care. The gendered and geographi
this work is appropriate and timely: **Indigenous wo
the most burden of HCV in their communities.** The
crisis in BC renders it a priority setting for HCV resea
intervention. The urban (Vancouver) and remote (Fr
Valley) stratification will attend to the excepted varia
HCV care needs between these two settings.