SPONTANEOUS CLEARANCE OF HEPATITIS C VIRUS IN A COHORT OF PATIENTS ENROLLED IN A HARM REDUCTION CLINIC IN NEW BRUNSWICK, CANADA: 2014-2018

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Those who spontaneously cleared their HCV infection were proportionally more often female, HIV positive and a resident of County B; however, these differences were not found to be statistically significant.

BACKGROUND

- Hepatitis C virus (HCV) is the most commonly reported blood-borne infection in New Brunswick.[1]
- Individuals with HCV infection have two natural history outcomes: Between 15-40% will achieve spontaneous clear (SC) of the virus, while the rest will develop chronic infection.[2-5] Chronic infection can have serious health and socioeconomic implications.[6]
- Factors positively associated with SC of HCV include: younger age, female sex, hepatitis B virus (HBV) co-infection, genotype 1 infection, and host IL28B CC genotype.[2-4]
- Factors negatively associated with SC of HCV include: Injection drug use (IDU), excessive alcohol consumption, and HIV coinfection.
- The likelihood of HCV SC plateaus at 12 months after infection. At this point, the infection will not likely clear without therapeutic intervention.[2]
- Anecdotally, a higher proportion of SC appeared to occur among those in county B in New Brunswick.

METHODS

- Data were extracted from the Hepatitis C positive and At-Risk (HEAR) database on all antibody-positive hepatitis C patients enrolled between April 2014 and May 2018 at a community-based harm reduction clinic.
- Data were presented as means and proportions, as appropriate. Patients were stratified into those with SC and those with chronic HCV infection, and logistic regression was performed to detect factors (age, biologic sex, HIV status, and residence in county B) potentially associated with higher rates of HCV SC.
- Inclusion of county B was related to anecdotal evidence that SC was higher in that area.
- To correct for the false discovery rate with multiple comparisons and small study population, p-values were adjusted to q-values using the Benjamini-Hochberg method. Statistical significance was a q-value < 0.05.

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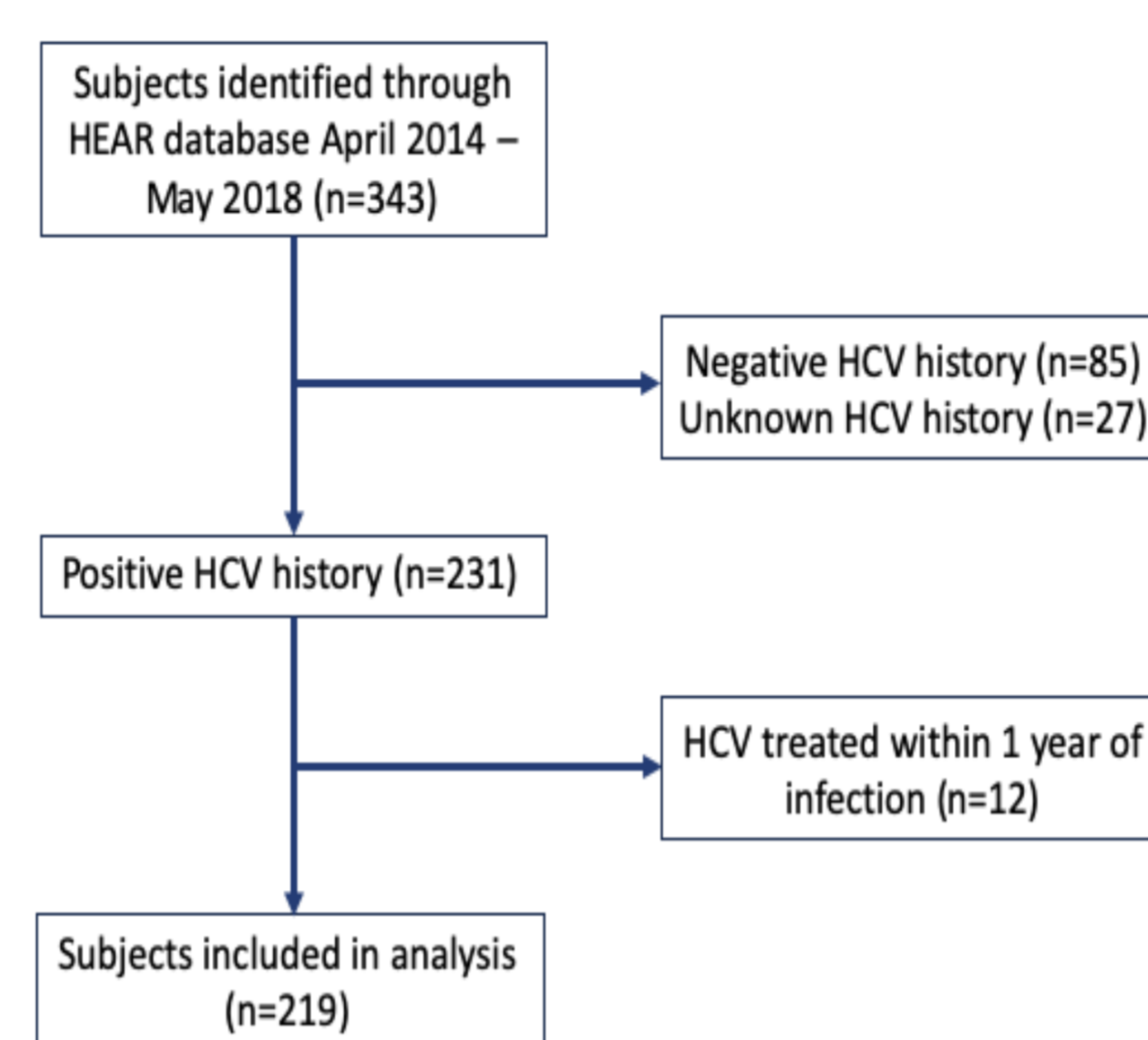
Figure 1: Flowchart of study inclusion.

Table 1: Baseline characteristics of the study population.

Characteristic	Spontaneous Clearance		Unadjusted p-value [*]	q-value [*]
	Yes (n=19)	No (n=200)		
Mean age, years	33.6	38.9	0.295	0.295
% Female sex	63.2%	36.8%	0.021	0.052
% HIV-positive	12.5%	1.9%	0.105	0.175
% County B residents	31.6%	16.0%	0.156	0.195

[*] Unadjusted p-values calculated using logistic regression.
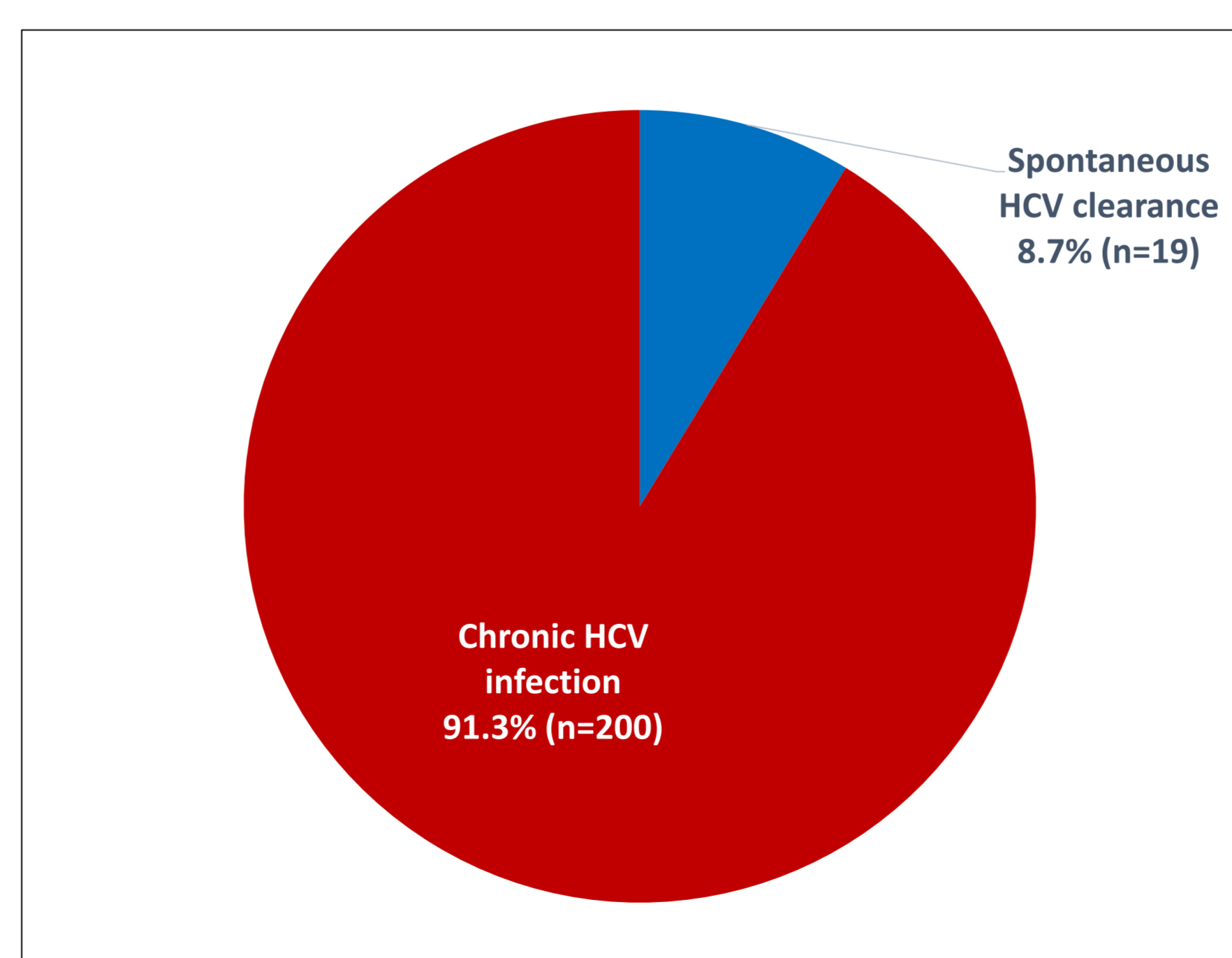[*] q-values calculated using the Benjamini-Hochberg method

Figure 2: Proportion spontaneously cleared among sample.

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RESULTS

- A total of 219 individuals who have HCV antibody positive results were included (Figure 1). SC was identified in 8.7% (n=19) patients (Figure 2).
- Mean age was 38.5 (±12.4) years with 30.6% (n=67) being female and 94.8% Caucasian. Once stratified, SC had a higher proportion of females (Table 1).
- The majority of individuals resided in county A at 67.6% (n=148), followed by county B with 17.4% (n=38), county C with 9.1% (n=20).
- At the time of enrollment into the HEAR database, a median time of 2.4 years (range 0-25 years) had lapsed since their first HCV antibody positive result.
- Injection drug use (IDU) was reported by 38.8% (n=85) within the previous 12 months.
- Co-infection with HIV was noted in 2.9% (n=5) of patients, there were no documented co-infections with hepatitis B (HBV).
- Genotype 1a was identified in 54.3% (n=119) of patients, the next most common being genotype 3 at 15.1% (n=33). Genotype was unknown in 17.4% (n=38) of patients.
- In 73.7% (n=14) of cases, the patient was initially PCR-positive but later demonstrated an undetectable viral load consistent with SC.
- In this sample, two patients each had two independent episodes of spontaneous clearance but for the purposes of this study, only the first episode was used.
- Only 5 patients who demonstrated SC were genotyped. Two were genotype 1a and three were genotype 3.

DISCUSSION

- Proportionally, the study results corroborate well-documented patterns of HCV SC; however, these differences were not statistically significant in this study.
- Younger age likely increases SC probability due to a more robust immune response to HCV.[2,3]
- Female sex likely increases SC via a theorized mechanism whereby female sex hormones bind to immune cells differently than do male equivalents.[3]
- Although HIV co-infection was associated with higher rates of SC in this study, it was not statistically significant and other studies have shown HIV-negative status to be associated with SC.[2-4]
- It can be difficult for healthcare providers to obtain detailed information from this study population due to loss to follow-up, patient non-adherence, stigma, and other social determinants of health.
- The relatively small sample size, and subsequently low numbers for each variable, is a major study limitation. Compiling provincial and national registries and performing diligent data collection will allow for more powerful research in the field.