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Research Article

REDUCED HCV RECURRENT VIREMIA IN PEOPLE WHO INJECT DRUGS (PWID) AFTER TREATMENT INDUCED HCV CURE

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ABSTRACT

We evaluated the risk of recurrent viremia in active PWID after achieving a sustained virologic response as a result of treatment in a multidisciplinary care facility, with enhanced long-term follow-up. Rates of recurrent viremia in this setting were lower compared to when treatment was implanted in a traditional clinical setting - highlighting the efficacy of this model.

INTRODUCTION

Approximately 242,000 Canadians are living with the Hepatitis C Virus (HCV), and a significant proportion (60%) of this population are people who inject drugs (PWID) [Public Health Agency of Canada, 2011]. The highest rates of new and existing cases of HCV infections as seen in people who inject drugs [Grebely, 2010]. The risk of HCV is most prevalent within this population are they are most likely to inject with borrowed syringes [Jacka, 2014]. PWID represent 75% of new HCV cases in the developed world but after treatment, the risk of reinfection is still high in the PWID population as their ongoing injection drug use increases their chances of reinfection [Newman, 2013] As a result, treatment for HCV infection in the PWID population is often withheld [Grebely, 2006].

A recent meta-analysis containing 59 studies investigated the occurrence of recurrent viremia post after subjects had achieved a sustained virologic response (SVR). The studies were categorized into three main population groups: low risk (43 studies), high risk PWID (14 studies) and HIV/HCV co-infected patients (4 studies). SVR was defined as undetectable HCV RNA for 12 or 24 weeks after treatment, while recurrent viremia was defined as the presence of HCV RNA after treatment. Determination of recurrent viremia was possible as relapse of the HCV RNA from the same viral lineage and reinfection with a different viral strain were differentiated. The meta-analysis estimated the risk of recurrent viremia (RV) in HCV infected PWID population at up to 32/1000 person-years of follow-up (PYFU) [Simmons, 2016].

The aim of this study was to demonstrate that the risk of reinfection can be highly reduced using a multidisciplinary model of care with enhanced follow-up once HCV treatment is completed. This model of comprehensive care in a clinical setting allows social, medical, psychiatric, and social aspects of patients' lives to be addressed and monitored, while receiving medical care at the same time.

METHODS

Patient Selection

An observational, retrospective study was conducted among HCV infected patients seen at the Vancouver Infectious Diseases Centre (VIDC) since 2010, including all active PWID having received HCV therapy and having achieved a sustained virologic response (SVR) as a result of treatment. There was no specific age, race, or gender-related inclusion criteria. Active, mono-infect, PWID are described 'high risk' individuals in the context of recurrent viremia.

Model of Care

At VIDC, all patients have access to comprehensive multidisciplinary care aimed to address psychiatric, addiction-related, social needs in an integrated manner along with traditional medical care. If needed, all patients can have snacks, over-the-counter medication and vitamin supplements on a daily basis, as required. Personalized interactions with staff and nurses provide the ability to identify specific medical or social needs and have them appropriately addressed. In a typical clinic visit, patients are seen by the physician of record, and receive other support services as

needed. By offering patients these resources, we can foster an environment to encourage safer addiction behaviors. Another tool of engagement of patients within this model is the organization of a weekly support group for HCV-infected patients, facilitated by a member of the clinic staff. Patients participating in the group share their experiences, expectations, and achievements with other members of the group in a friendly and non-judgmental atmosphere. This allows for an open discussion about the factors contributing to the acquisition of disease and will allow the healthcare professionals to have a forum to educate patients about their illness, and ways of dealing with it in a productive manner. Topics discussed include all aspects of patient care including social issues, addiction management, and pathophysiology of the disease.

Data Collection and Synthesis

Data collected for patients that met the inclusion criteria included demographic variables, HCV infection status, treatment regimens, injection drug use history, follow-up duration, and incidence of recurrent viremia. Recurrent viremia was differentiated from relapse by comparing the viral lineage of past and current samples. The incidence of recurrent viremia was calculated as the number of recurrences per 1000 person years of follow-up (PYFU) and was reported with a corresponding 95% Wilson confidence interval (95% CI).

RESULTS AND DISCUSSION

Overall, 70 active PWID who achieved treatment-induced SVR were included in this analysis. High-risk PWID made up 43% (30) of this population while 57% (40) of individuals were active PWID, co-infected with HIV/HCV. The overall demographics were: mean age of 53 years, 85% male, 60% genotype 1, 57% HIV co-infected, 22% cirrhotic, 83% treatment-naïve, 63%/70% using heroin/stimulants, 58% on opiate substitution therapy.

With a mean of 5.5 PYFU, the rate of recurrent viremia was 13/1000 PYFU (95% CI, 0.031 - 0.157%), a rate 60% lower than recently reported in the medical literature. Of five cases of RV: the mean age was 52 years, and 100% male, 80% GT 1a, 100% HIV co-infected. Furthermore, 100% used amphetamines, 80% used heroin, and 60% were cirrhotic. Demographics and recurrent viremia statistics are summarized in Table 1.

Table 1 Demographic, drug use, and recurrent viremia statistics in active PWID that achieved treatment-induced virologic response

Population Characteristics (n=70)	
Median age	53
Male (%)	60 (86)
HIV/HCV Co-infect (%)	40 (57)
Cirrhotic (%)	15 (21)
Genotype 1 (%)	42 (60)
Injection Drug Use (n=70)	
Cocaine use (%)	49 (70)
Heroin use (%)	44 (63)
Other drug use (%)	16 (23)
Opiate Substitution Therapy (%)	41 (59)
Recurrent Viremia (RV)	
Mean PYFU	5.5 years
Incidence of RV	5
Rate of RV	13.0/1000 PYFU
Wilson Confidence Interval	95% CI, 0.031 – 0.157%

It is well demonstrated that the social determinants of health, such as housing, availability of social and welfare support, and stigma associated with HCV infection translate directly into reduced treatment uptake and adherence by the patients. This directly results in the traditionally observed lower rates of SVR among HCV - infected PWID [Grebely, 2013]. Our research demonstrates that with proper engagement of this population into care and facilitation of access to social services (disability applications, shared housing, and nutritional support), along with the provision of in-house addiction and psychological counseling services, proper engagement in care can occur and significant numbers of patients can be successfully treated for their HCV infection.

Within a cohort of 70 active drug users who achieved SVR, most were mixed drug users (using more than one drug at a time). With this difficult-to-treat, homeless, treatment naïve population, over a 5.5-year period, there were only 5 cases of recurrent viremia giving a recurrent viremia rate of 13.0/1000 PYFU, a rate drastically lower than those reported in recent reviews [Simmons, 2016]. We believe this can be attributed to the model of care provided at VIDC and the structured post – SVR follow – up schedule applied to all patients, which helps reduce ongoing risk behaviors that could transmit HCV infection.

All five patients with recurrent viremia had concurrent psychological disorders, and were co-infected with HIV. Three out of five were homeless. It may be that novel approached to acting on these condition, in addition to the care model we are already providing will serve to reduce rates of recurrent viremia.

In conclusion, our significant cohort of HCV-infected PWID successfully treated for their HCV infection demonstrates the importance of a multidisciplinary approach to achieve successful engagement in care and treatment in this difficult population. This model, we believe, will also help reduce the rate of recurrent viremia post-treatment that has been a great concern in addressing the HCV pandemic in vulnerable inner city populations. With the advent of all – oral regimens, even more PWID can be recruited into care and more effectively treated. The provision of medical care in a model such as ours will maximize the benefits of these highly effective (and also highly expensive) interventions.

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