

Research Article

The Implication of Excessive Illicit Drug and Alcohol use on the Liver and a Possible Link to the Rising Incidence of HCV Infection in Farmington, New Mexico

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Abstract

Background: Patients engaged in substance abuse are prone to getting infected with Hepatitis C Virus (HCV), commonest in excessive Illicit Drug Use (IDU); and with heavy consumption of alcohol, the liver becomes more vulnerable, causing more severe liver injury, which promotes disease progression to cirrhosis and increases the risk for liver cancer. Some on-going research suggests that even moderate use of these substances may trigger liver damage in HCV-infected patients. Almost one-third of individuals with substance abuse with clinical symptoms of liver disease have been infected with HCV, which is four times the rate of HCV infection found in others who do not have liver disease. People with more severe liver disease are considerably more likely to test positive for HCV infection than those with less severe liver disease. Furthermore, several studies have indicated that heavy consumption of alcohol, rather than the types consumed, and illicit drugs accelerates the progression from chronic HCV to cirrhosis and liver cancer in affected individuals.

Objective: The objective of this study is to reveal the implication of excessive illicit drugs and alcohol use on the liver with emphasis on a possible link to the rising incidence of HCV infection in Farmington, a city in the San Juan County of New Mexico.

Method: Cross-sectional analysis of individuals that qualified as being drug or alcohol-dependent using our set parameters, and have used these substances excessively with evidence of sequelae is adopted in this study. Flyers were sent randomly to residents requesting for their consent to participate in the study, with our targets clearly stated. Sixty-five people indicated their interest initially, but we ended up recruiting 54 participants for the study. This was conducted between June and November 2021. Information was obtained using simple interview techniques, telephonic following the pattern of our structured generic and self-administered questionnaires. Selected blood works were done on one of the visits to the city with a team of health workers while relevant available results were obtained from participants and adopted for the study.

Results: Fifty four people participated in the study cutting across all race and ethnic groups. Age range is between 18 and 70-year-old and show a significant number of males, 38 (70.4%) engaged more in substance abuse, tested positive more for HCV and are more prone to liver damage; as against 16 female participants, (29.6%) with reduced susceptibility to the sequelae. Racial distribution shows a predominance of cases of substance abuse among the Hispanic/Latinos at M-16.7% and F-7.4%, closely followed by White, non-Hispanics at M-13.0% and F-5.6%. Alcoholic beverages commonly implicated in liver damage are the distilled spirits comprising of vodka, whiskey, rum, brandy and gin, followed by the regular beer. Excess consumption refers to four drinks or more in a day or 15 drinks or more in a week in men; and 3 drinks or more in a day, or 8 drinks or more in a week in women. Cocaine, heroin, methamphetamines and marijuana are among the most commonly abused and hence implicated in HCV infection and subsequent liver damage.

Conclusion: These findings strongly corroborate the submission that illicit drug users, regardless of age, gender or race, are prone to HCV infection especially in prolonged and injudicious usage. This is also in line with a national survey conducted in 2018 and published in a 2018 edition of the American Journal of Public Health where it was stated that the national increase in acute HCV infection is related to the country's opioid epidemic and associated increases in IDU.

Keywords: Illicit drug use; IDU alcohol abuse; Opioid; Farmington county; HCV; Liver damage

Introduction

Hepatitis C virus infection is fast becoming the most common chronic blood-borne infection in the United States among the other acute or chronic forms of hepatitis and consequently a major cause of morbidity and mortality. Many studies put the risks of HCV to only

Injection Drug Use (IDU), but as much as this can be accepted as the primary risk factor for HCV transmission and the leading cause of incidence in the United States, an estimated 70% to 90% of persons in the United States who have injected drugs for 10 years or more are infected with HCV; however, limited epidemiologic data suggest an additional risk from non-injection (snorted or smoked) use of cocaine [1]. An estimated 2.4 million Americans are living with HCV based on 2013-2016 annual average, with an estimated 44,700 new cases of acute HCV in 2017. In fact, new cases of acute HCV have increased rapidly in the US since 2010 and have most often been associated with injection drug use [2,3]. In 2018, a total of 3,621 cases of acute hepatitis C were reported to CDC. After adjusting for under-ascertainment and under-reporting, an estimated 50,300 acute hepatitis C cases occurred in 2018. Left untreated, hepatitis can lead to cirrhosis, a progressive deterioration and malfunction of the liver. It can also lead to a type of liver cancer called hepatocellular carcinoma. In fact, HBV and HCV infections are related to about 65 percent of liver cancers worldwide.

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Nearly 50 percent of the cases are caused by HCV alone [2-4]. During the next 40 to 50 years, 1 million people with untreated chronic HCV infection will likely die from complications related to their HCV. Since 2012, there have been more deaths due to hepatitis C than all 60 of the other reportable infectious diseases combined.

It is essential to highlight the group at risk of HCV infection generally before narrowing down to the subject matter. These include:

- People with HIV infection
- Current or former People Who Use Injection Drugs (PWID), including those who injected only once many years ago
- People with selected medical conditions, including those who ever received maintenance
- Hemodialysis [4,5].
- Prior recipients of transfusions or organ transplants, including people who received clotting factor concentrates produced before 1987, people who received a transfusion of blood or blood components before July 1992, people who received an organ transplant before July 1992, and people who were notified that they received blood from a donor who later tested positive for HCV infection [6].
- Health care, emergency medical, and public safety personnel after needle sticks, sharps, or mucosal exposures to HCV-positive blood
- Children born to mothers with HCV infection
- HCV is transmitted primarily through parenteral exposures to infectious blood or body fluids that contain blood. Most common exposures include:
 - Injection-drug use (unequivocally and currently the most common mode of HCV transmission in the United States). Opioids are by far the most implicated illicit drug of abuse at the moment in the U [1-4]. Opiates and opioids are often used interchangeably but they are different. While opiates are narcotics derived from the opium poppy plant and hence naturally occurring or referred to as natural opioids, (such as heroin, morphine and codeine); opioids are not naturally occurring narcotics but still refer to all natural, semisynthetic and synthetic narcotics, (examples include methadone and fentanyl), and hence the term, "all opiates are opioids but not all opioids can be classified as an opiate" [6]. Other forms of illicit drugs commonly used apart from the opioid narcotics and mostly IDUs are cocaine and crack cocaine, methamphetamine, ketamine and hallucinogens (LSD, PCP, mushrooms, salvia). Others are ecstasy, inhalants (spray paints, markers), natural and synthetic marijuana.
- Birth to an HCV-infected mother

Other less frequent but possible mode of transmission includes:

- Sex with an HCV-infected person (although, said to be less inefficient means of transmission when compared with HIV infected men who have sex with men [MSM] and consequently, have increased risk of sexual transmission)
- Sharing personal items contaminated with infectious blood,

such as razors or toothbrushes

- Other health-care procedures that involve invasive procedures, such as injections
- Unregulated tattooing
- Receipt of donated blood, blood products, and organs (although now rare in the United States since blood screening became available in 1992)
- Needle stick injuries in health-care settings

Abuse of alcohol on the other hand could be referred to as heavy drinking when taken too much or too often and implicated in direct liver damage or accelerate liver damage in coexisting illicit drug user that is now infected with HCV. It should be reiterated that heavy drinking refers to the consumption of four drinks or more in a day or 15 drinks or more in a week in men and 3 drinks or more in a day, or 8 drinks or more in a week in women [7]. In some instances, however, a single binge drinking could also result in liver impairment or outright damage due to idiosyncrasies.

Please take note of the following:

One drink is;

1. 12 ounces of regular beer
2. 8-9 ounces of malt liquor, known to contain more alcohol than regular beer
3. 5 ounces of wine
4. 1 ½ ounces of distilled spirits like vodka or whiskey.

Patients and Methods

Participants in this study includes randomly selected resident of Farmington County most of who would prefer to remain anonymous. The Covid-19 pandemic and the recurrence in forms of different variants at different times had restricted in-person visits to select the participants. Flyers were however sent out inviting interested individuals for the study on their terms over a period of 3 months. 54 out of the initial 65 individuals that indicated interest in the study were eventually evaluated. The study was designed as a cross-sectional prospective study of individuals that have qualified as being drug or alcohol-dependent and have used these substances excessively with evidence of sequelae, (i.e., HCV infection and liver damage). The study was conducted between July and December 2021. Information was obtained using simple interview techniques, telephonic and the use of self-administered generic questionnaires comprising of 30 items divided in 3 parts and a combination of direct open-end questions and multiple-choice questions. Recent blood works indicating HCV infections were accepted from some of the participants while others were done on site after obtaining consent on one of the visits to the city by a team of health workers. Some records were also pulled from established patients in our facility who qualified for the study.

Result

Of the 54 patients who were eventually evaluated, 38 (70.1%) of them were males while 16 (29.9%) were females, with the age ranging from 18 to 70 years for both genders. The males had more years of exposure to the illicit drugs observed in these studies ranging from 2 to 10 years while the female's exposure was limited to between 1 to 6 years. This could directly mean that the male gender is more prone to getting infected with HCV going by this study's statistics and others

compared on the national level. 29 of the 38 males accounting for 53.7% of patients studied tested positive for HCV with the year of diagnosis after exposure to the illicit drugs ranging from 2 to 5 years while 9 of the 16 females evaluated accounting for 16.7% of the population studied tested positive for the HCV with year of diagnosis following exposure ranging from 1-3 years. More male patients come down with liver damage in both HCV positive and negative individuals at 18.5% and 5.6% respectively in a ratio 3.3:1 while female patients also recorded the same pattern of 3.5:1 but at a lower percentage of 13.0% and 3.7% respectively. Racial distribution shows a predominance of cases of substance abuse among the Hispanic/Latinos at M-16.7% and F- 7.4%, closely followed by White, non-Hispanics at M-13.0% and F-5.6%. The clinical syndrome of liver damage obtained include liver cirrhosis, liver failure and liver cancer (Tables 1-3).

The commonest and the least common single drug consumed in males apart from occasional cocktail is cocaine and jointly ecstasy, ketamine, and inhalants; accounting for 13.0% and 1.9% of the study population respectively. In females, marijuana accounts for the most drugs consumed at 5.6% of the study population while no account of ketamine use was reported in them. Both males and females had engaged in excessive consumption of distilled spirits comprising of vodka, whiskey, rum, brandy, and gin at a percentage of 27.8% in males and 7.6% in females while herbal concoction fortified with alcohol were the least consumed in both at 5.6% and 1.9% in male and female respectively (Tables 4 and 5).

A further probe to determine why the patients engaged in illicit drug use and alcohol abuse reveals that majority of the study population, both males and females succumbed to peer pressure to engage in substance abuse, 18.5% and 9.3% in males and females respectively while a large percentage claimed it was due to their being homeless and wandering on the streets; (M-11.1% and F-7.5%). A few of them on both sides could not ascertain any reason for engaging in illicit drug use and alcohol abuse, claiming they just found themselves in the act by chance. Racial distribution shows a predominance of cases of substance abuse among the Hispanic/Latinos at M-16.7%

Table 1: Demographic characteristics of people on illicit drug use.

	Male	Female	Total
Sex distribution No (%)	38(70.1)	16(29.9)	54(100)
Age range - (Years)	18-70	26-65	18-70
- Mean (SD)	37.5(± 2.9)	43.4(± 1.8)	39.1(± 2.0)
Duration of drug use			
Range (Years)	2-10	1-6	1-10
Mean (SD)	5.6(± 2.3)	3.2(± 0.8)	4.9(± 1.5)

Table 2: Racial distribution among substance users in Farmington County.

Race/ Ethnicity	Male	Female	Total
	No (%)	No (%)	No (%)
White (Non-Hispanic)	7 (13.0)	3 (5.6)	10 (18.5)
Hispanic/Latino	9 (16.7)	4 (7.4)	13 (24.1)
Black/ African American	4 (7.4)	2 (3.7)	6 (11.1)
Native American/Indian	6 (11.1)	3 (5.6)	9 (16.7)
Asian	5 (9.3)	2 (3.7)	7 (13.0)
Multiracial	4 (7.4)	1 (1.9)	5 (9.3)
Others(Pacific Islanders etc)	3 (5.6)	1 (1.9)	4 (7.4)

Table 3: HCV Seropositivity among illicit drug users.

Substance Abuse	HCV positive	Liver damage	HCV negative	Liver damage	Year diagnosed
	No (%)	No (%)	No (%)	No (%)	(Range)
Male	29 (53.7)	10 (18.5)	9 (16.7)	3 (5.6)	2-5
Female	9 (16.7)	7 (13.0)	7 (13.0)	2 (3.7)	1-3
Total	38 (70.4)	17 (31.5)	16 (29.7)	5 (9.3)	

and F- 7.4%, closely followed by White, non-Hispanics at M-13.0% and F-5.6%. Anecdotal evidence in the Farmington County revealed a steady rise in the incidence of illicit drug use in particular and concomitant increase in these population testing positive for HCV. This was compared to a study reported by the CDC which shows a continuous increase in acute HCV infection related to a growing opioid epidemic and associated injection drug use in the U.S between 2004 and 2014 (Table 6) (Figure 1).

Discussion

There is not much existing record showing the relationship between HCV infectivity following illicit drug use and alcohol abuse in the Farmington County until the pilot study carried was out and before this study eventually indicated the trend. This was further confirmed by a series of anecdotal evidence obtained following the series of results either presented or carried out during this study. There is enough reason to believe that the case has been on steady increase over the last few years as this was further buttressed by this study. When extrapolated with existing studies, regional and national, there is evidence that people exposed to illicit drug use are prone to infection by HCV. Surveillance data from four states (Kentucky,

Table 4: Types of Illicit drug used.

Drugs	Male No (%)	Female No (%)
Cocaine	7 (13.0)	2 (3.7)
Heroin	4 (7.4)	2 (3.7)
Fentanyl	3 (5.6)	1 (1.9)
Oxycodone	3 (5.6)	1 (1.9)
Morphine	4 (7.4)	2 (3.7)
Methadone	3 (5.6)	1 (1.9)
Ecstasy	1 (1.9)	1 (1.9)
Ketamine	1 (1.9)	0 (0.0)
Methamphetamine	3 (5.6)	1 (1.9)
Marijuana	6 (11.1)	3 (5.6)
Hallucinogens	2(3.7)	1 (1.9)
Inhalants	1 (1.9)	1 (1.9)

Table 5: Types of Alcohol consumed.

Alcohol	Male No (%)	Female No (%)
Beer	6 (11.1)	4 (7.4)
Vodka	4 (7.4)	1 (1.9)
Whiskey	2 (3.7)	1 (1.9)
Rum	3 (5.6)	0 (0.0)
Brandy	3 (5.6)	1 (1.9)
Gin	3 (5.6)	1 (1.9)
Wine	5 (9.3)	3 (5.6)
Mixed beverages	5 (9.3)	2 (3.7)
Herbal concoction	3 (5.6)	1 (1.9)
Raw spirit	4 (7.4)	2 (3.7)

Table 6: Reasons for drug use.

	Male No (%)	Female No (%)
Peer pressure	10 (18.5)	5 (9.3)
Medicinal	4 (7.5)	1 (2.0)
Forced under duress	5 (9.3)	0 (0.0)
Homelessness	6 (11.1)	4 (7.5)
Unemployment	4 (7.5)	2 (3.8)
To feel high	5 (9.3)	2 (3.8)
Not known	3 (5.7)	2 (3.8)

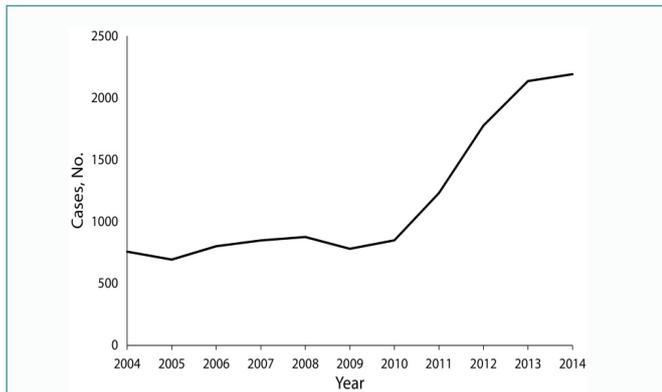


Figure 1: Increases in Acute Hepatitis C Virus Infection Related to a Growing Opioid Epidemic and Associated Injection Drug Use, United States, 2004 to 2014 [10].

Tennessee, Virginia, West Virginia) showed a substantial increase (364%) in the number of cases of acute HCV infection from 2006 to 2012 among persons aged ≤ 30 years from different causes especially from illicit drug use [9].

National surveillance data also show a substantial increase in the incidence of acute HCV infection throughout the United States from 2004 to 2014 [9,10]. This increase was significant for persons aged 18 to 39 years, women and men, and non-Hispanic Whites and Hispanics. In the same study, the rates of acute HCV infection were almost 4-fold increased among women and more than 2-fold among men over the 11-year period. Our study however shows a predominance of cases of substance abuse among the Hispanic/Latinos at M-16.7% and F-7.4%, closely followed by White, non-Hispanics at M-13.0% and F-5.6%. Injection Drug Use (IDU) was the most frequently cited risk factor among the population studied. This is in line with this study which revealed that among the different risk factors the patients were exposed to, IDU ranked highest as illicit drugs consumed and invariably implicated in HCV infectivity amongst the population [11].

Several studies have indicated that heavy consumption of alcohol, rather than the types consumed, and illicit drugs accelerates the progression from chronic HCV to cirrhosis and liver cancer in affected individuals [12].

Alcoholic beverages commonly implicated in liver damage in Farmington County are the distilled spirits and concocted alcoholic beverages. Significant consumption will be eight drinks or more in a week for women and fifteen or more in men. It should however be noted that in some instances, a single binge drinking could also result in liver impairment or outright damage due to idiosyncrasies. Cocaine, heroin, morphine, and marijuana are among the most abused and hence implicated in HCV infection in this study and subsequent liver damage. Illicit drug users constitute the core of the HCV epidemic [13]. A well-structured treatment strategy effective with persons who use drugs is essential to control the epidemic. There are fortunately clinicians cutting across all specialties of internal medicine and family practice in their different cadre across the country, undertaking hepatitis C research presently bringing to fore their clinical experience in the management of HCV infections among IDUs and chronic alcoholics. Such is the Project ECHO forum of the University of New Mexico where cases of this nature are discussed and where one of our patients and participants was presented as a case study. [Attached] Admittedly, caring for illicit drug users and chronic alcoholics poses special challenges to the health care team, requiring

special skills and attributes including patience, experience, tolerance, and empathy [14,15]. There is also the need for mutual respect in dealing with these substance users, without being in too much of a hurry to pass judgments. Collaborations and expert discussion groups such as mentioned above are essential to successfully treat and rehabilitate individuals engaged in illicit drug use and alcohol abuse.

Conclusion

There is no denying the fact that the HCV infection is on the rise among substance abusers and may continue to be on the rise in the coming years. It is therefore essential that steps to curb the trend be put in place to prevent the coming generation from falling victim of the same menace; and for those who are already implicated and infected with HCV; adequate step should be taken towards their effective treatment and rehabilitation. Recent advances in hepatitis C treatment have made it necessary to recommend that treatment be extended to include illicit drug users and alcohol abusers who are previously excluded. This recommendation is important because these population constitute the core of the hepatitis C epidemic [13,16]. They are the largest group of infected persons, the group in which most new infections occur, and the group that has been the most severely affected by the epidemic in spite of myriads of other causes.

There is currently availability of antiviral medications for HCV treatment including recent newly FDA-approved medications. Many of the new antiviral HCV medications have as high as 90% success rate when taken within short periods of as little as 3 months and can cure HCV infection [17]. This is an improvement when compared with the old medications which were usually taken for a prolonged periods without attaining cure in the patients. The progression to liver cirrhosis or liver cancer and hence overall morbidity and mortality are much likely to be reduced if these treatments are affected early in affected individuals.

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