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Hepatitis-C Multimedia Prevention Program in Poor Hispanic HIV-Infected Injecting Drug Users: Six Months after Intervention

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Abstract

Background—In order to prevent the spread of the hepatitis C virus (HCV) amongst Hispanic injecting drug users (IDUs), we developed, validated, and implemented a multimedia educational intervention program.

Methods—A pre-post intervention study design was used to evaluate long-lasting knowledge and behavior changes in a group of 88 poor Hispanic HIV-infected IDUs. Pre-intervention data was compared with data measured six months after the intervention.

Results—A significant increase in the awareness regarding HCV clinical manifestations, HCV risky behaviors, HCV prevention practices and HIV/HCV co-infection synergisms was observed in the group six months post intervention.

Conclusion—Our study confirms the long-lasting benefits of multimedia based intervention programs for disseminating HCV prevention strategies in IDUs. Therefore, preventive educational approaches that use images, figures, and animations tools can be recommended to target and tailor interventions for vulnerable populations.

Introduction

Hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are blood-borne pathogens, commonly transmitted by sharing drug injecting equipment and paraphernalia used in the preparation and administration of drugs for injection.¹⁻³ Both viral infections are unevenly distributed across ethnic groups of injecting drug users (IDUs) in the US and elsewhere, with US African Americans and Hispanics having disproportionately higher rates.³⁻⁵ Although significant advances have been made in preventing HCV and HIV-infection in IDUs, there are still gaps which must be addressed.^{1, 6} Syringe exchange programs (SEP) and methadone maintenance treatment programs (MMTP) are well known prevention strategies designed to engage the individual in harm reduction practices for HCV and HIV transmission.⁷⁻⁹ However, additional prevention strategies are needed, especially in countries where these type of programs are poorly designed or implemented. In Puerto Rico for example, less than 15% of the syringes used by IDUs come from SEP. Most are from

private sellers who do not necessarily provide educational information on how to reduce risks of blood borne infections.¹⁰ Consequently, complementing SEP and MMTP approaches with prevention strategies that promote safe injection education is critical.¹¹⁻¹³ Based on this need, we developed and implemented a multimedia HCV prevention intervention program for vulnerable persons, based on the Health Belief Model (HBM) and Social Cognitive Theory (SCT) framework.¹⁴ The principal behavioral target of this intervention was the reduction of HCV-associated risk behaviors among Hispanic HIV-infected IDUs. Previously published results described the feasibility, acceptability, and immediate short-term effectiveness of this program.^{14, 15} The present study is reporting the long lasting knowledge and behavior's changes, measured six months after the intervention.

Methods

Study design

The study was an intervention trial conducted on a group of HIV-infected persons recruited from February 2006 through December 2008. Participants were HIV-infected IDUs visiting the Retrovirus Research Center (RRC) in Bayamón, Puerto Rico, for HIV-related care. Most of the patients seen through the RRC have an annual family income below the US Federal Poverty Level. A test-retest study design was used to evaluate the effects of a novel multimedia educational intervention based on the HBM and SCT framework.¹⁴⁻¹⁵ A self-administered questionnaire evaluated changes in HCV knowledge, perception of disease severity and infection's susceptibility, as well as changes in HCV risk behavior practices in HIV-infected persons. The questionnaire was administered at eight weeks and six months after the intervention. The instrument utilized Likert scales, with other measures, to evaluate disease severity perceptions and risk behavior practices. This study's educational intervention description, study design, study implementation, instrument description, outcome measures collection and evaluation have been described in previously published work.¹⁴⁻¹⁵ The study was conducted with the approval of the Institutional Review Board (IRB) of the Universidad Central del Caribe, at Bayamón Puerto Rico.

Statistical analysis

Differences in the data within baseline and between baseline and follow-up were assessed with Chi Square, t-test, McNemar and Wilcoxon signed ranks tests. Non-parametric tests were used to avoid unequal pairwise correlation across repeated measures and to correct for small sample size effects. A 2-tailed p-value of less than 0.05 was used to evaluate statistical significance. Statistical analyses were performed using Statistical Package of Social Sciences (SPSS Inc., Chicago, IL).

Results

Study enrollment

Of the total of 138 participants enrolled in the study, 88 (63.7%) completed the 6-month evaluation questionnaire. No statistical differences at enrollment were observed between those who completed and those who did not completed this evaluation (Table 1). Of the 88 participants, 72 (81.8%) were male and 72 (81.8%) were co-infected with HCV (Table 1).

The mean age was 42.7 years, with a standard deviation (SD) of ± 9.2 years and the mean educational level was 10th grade. All the study participants had an annual family income that was below the US Federal Poverty Level. Over one third of them (39.8%) reported active drug injection practices during the six months prior to study enrollment; 20 (22.7%) reporting active drug injection practices during the previous month before enrollment into the study (table 1).

Hepatitis and HCV knowledge changes

Six months from baseline, study participants showed a significant improvement in their ability to accurately define hepatitis as liver damage and to identify the presence of a virus as the cause of the HCV (Table 2). Similarly, knowledge concerning viral distribution in bodily fluids, HCV clinical manifestations, HCV treatments, and HCV co-infection increased significantly at the 6th month's re-evaluation (Table 2). This knowledge improvement was more relevant in relation to the HCV treatment, lack of HCV vaccine, and HIV co-infection (Table 2). Knowledge of HCV-infection associated risk behaviors also had an incremental increase over time, especially in relationship to sharing drug paraphernalia, sharing razors, unprotected sex, and getting body piercings (Table 3). Conversely, the significant reduction in the misconceptions that coughing, sneezing, or sharing food/utensils contributed to the HCV transmission remained in the 6th month's re-evaluation (Table 3).

HCV perception of severity

The perception of HCV infection as a severe healthcare disease remained high over the study period. However, the perception of HCV infection as a cause for liver cirrhosis and cancer slightly decreased over the study period (Table 4). The current intervention highlighted the positive effect of an adequate and opportune HCV therapy in the infection's prognosis, and the spontaneous remission in over 20% of the cases. Based on these data, we can hypothesize that the HCV knowledge improvement could be related to this awareness's reduction.

HCV risk-behavior changes

The number persons who reported active drug injecting behaviors in the previous month decreased from 20 at enrollment to 12 at the six month evaluation. Similarly, the reported HCV risk behavior, related to their injecting drug use practices, decreased significantly compared to baseline, especially in the use of shooting galleries and in paraphernalia sharing (Table 4).

Discussion

It is well known that drug users, especially IDUs are one of the most vulnerable groups to increased risk of infection and reduced access to healthcare, health education, and prevention strategies.^{3, 16} Existing limitations in access to HCV and HIV education and preventive interventions in IDUs increases the transmission of the viruses.⁸ Because HCV and HIV are easily spread through the blood, especially during drug injection process, it is generally accepted that the strategies to prevent HCV transmission among IDUs will also prevent HIV transmission.^{1, 8, 16} Syringe exchange programs, a well-known prevention

strategy for preventing blood-borne infections, exist in Puerto Rico; however, they are not commonly used by IDUs. Syringes are obtained primarily from private sellers, who do not typically provide educational strategies that emphasize the reduction of the HCV transmission.¹⁰

The present study supported that the HCV multimedia educational intervention created for IDUs could produce durable health-related behavior changes by improving the HCV infection knowledge and by promoting preventive strategies. Our previous publication reported knowledge improvement and HCV risk behaviors reduction two months after the intervention. The present study demonstrated that these changes were sustained six months post-intervention.

Given the high HCV prevalence in the participant group, the more relevant prevention issue for this study is if there would be a reduction of further HCV transmission, rather than a reduced incidence of HCV infection in the participants. The high baseline prevalence of HCV in the study group has limited the possibility of evaluating the prevention effects of the multimedia intervention in reducing the HCV incidence among uninfected IDUs. This represents a study limitation that requires further evaluation. However, there was a sustained reduction in the sharing of syringes and drug preparation equipment reported by the participants. This behavior change would directly reduce the opportunities for cross-contamination of these devices with HCV infected blood. In theory, a reduction in the infection source would have a preventive effect among the uninfected population. Interrupting HCV and HIV transmission has been seen as the optimal goal and standard public health concept of disease reduction.¹⁷ Lessening the HCV burden from the risky behavior practices would reduce the scope of the virus transmission, diminishing the overall incidence of HCV in IDUs.

This study does have several limitations. First, not all participants completed the 6th month post-intervention evaluation, introducing a potential source of bias. Second, the study measured only self-reported behaviors which may have been an under- or overestimation of the actual behavior change. Third, participants' tendency to provide socially acceptable or desired responses to the questionnaire may have introduced bias into the data. Fourth, a low prevalence of active injecting drug use in the study group may limit the program's goal of reducing HCV-infection risk behavior. Therefore, this multimedia intervention would need to be implemented in uninfected IDUs at an earlier stage of drug addiction and with a higher level of active drug use in order to confirm the lasting preventive trend suggested here.

In conclusion, this computer-based intervention appears to be helpful in generating durable changes related to HCV knowledge improvements and reducing HCV risk behavior among Hispanic HIV-infected IDUs. The introduction of similar preventive strategies in this frequently inaccessible and marginalized population may ultimately serve to decrease this hard-to-control healthcare issue.

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Table 1

Baseline findings by groups of persons who completed and did not completed the 6th month post intervention evaluation

	Completed (n=88)	Not completed (n=50)	P-value
Male (%)	81.8	86.0	0.274
Age at study entry (mean± SD)	42.7±9.2	40.4±9.1	0.149
Educational level (mean± SD)	10±3.2	10±2.9	0.653
Age of first IDU (mean± SD)	20.2±18.9	20.4±19.1	0.880
IDU in the last month (%)	22.7	36.0	0.093
IDU in the last semester (%)	39.8	50.0	0.244
HCV co-infected at enrolment (%)	81.8	82.6	0.768
HCV knowledge (%)			
HCV is predominantly in blood	90.9	97.9	0.104
Not all HCV-infected patients have symptoms	54.5	60.0	0.534
HCV infection can lead to liver cancer	74.1	70.0	0.524
HCV treatment is available	58.1	70.0	0.160
An HCV vaccine is not available	36.8	44.0	0.377
Not all HCV treated persons get cured	72.9	66.0	0.406
HCV treatment could affect HIV therapy	33.7	30.0	0.951
Not all HIV/HCV persons can receive HCV therapy	23.0	30.0	0.345
HCV risk behavior knowledge (%)			
Used of injecting drugs	98.7	94.0	0.291
Reusing cookers or filters from other IDUs	84.1	78.0	0.507
Sharing paraphernalia for cocaine sniffing	59.1	60.0	0.807
Coughing and sneezing	35.2	26.0	0.296
Sharing eating utensils	46.6	38.0	0.377
Having unprotected sex	79.5	46.0	0.784
Men having sex with men (n=113)	66.2	54.8	0.226
HCV prevention self confidence (median (IQR))			
Using their own syringe	10 (9-10)	10 (10-10)	0.378
Not using others' filters or cottons	10 (6-10)	10 (8.8-10)	0.269
Utilizing water from their own containers	10 (9-10)	10 (9.8-10)	0.677
Not permitting others to use their water containers	10 (8.3-10)	10 (10-10)	0.436
Refusing to let their syringes be back loaded	10 (7-10)	10 (8.8-10)	0.712
Rejecting used filters or cookers	10 (8-10)	10 (6.8-10)	0.905

HCV = Hepatitis C; IDU=Injecting drug use; IDUs=Injecting drug user; SD=Standard deviation; IQR= Inter Quartile Rate

Table 2

Pre- and post-intervention knowledge evaluation

Liver, Hepatitis, and HCV virus knowledge	Day 0 (%)	8th Week (%)	6th Month (%)
Hepatitis means liver damage or harm	87.5	97.7*	97.7*
The liver has a metabolic function	64.8	66.7	67.0
HCV is a viral condition	75.0	84.9	86.4
HCV is predominantly in the blood	90.9	95.4	97.7
HCV is not predominantly in urine	71.6	83.9	89.8*
HCV is not predominantly in stools	75.0	81.6	85.2
HCV is not predominantly in semen	62.5	70.2	69.3
Not all HCV-infected patients have symptoms	54.7	61.6	60.2
Over 50% of HCV-infected develop chronic infection	83.0	74.7	87.5
HCV infection can lead to liver cancer (n=87)	74.7	70.6	75.9
HCV treatment is available (n=87)	58.6	72.1*	70.1
An HCV vaccine is not available (n=87)	35.6	52.9*	59.8*
Not all HCV treated persons get cured (n=86)	72.1	75.3	74.4
HCV treatment could affect HIV therapy(n=87)	34.5	52.9*	69.0*
Not all HIV/HCV persons can receive HCV therapy	22.7	37.9*	33.0

* p value < 0.05 between baseline and second or third evaluations, by McNemar's Test

HCV = Hepatitis C; HIV= Human Immunodeficiency virus

Table 3

Pre- and post-intervention HCV risk-behavior knowledge evaluation

Risk behaviors	Day 0 (%)	8th Week (%)	6th Month (%)
Reusing syringe during drug injection	98.9	97.7	98.9
Reusing cookers or filters from other IDUs	84.1	92.0	95.4*
Getting a tattoo under unhygienic conditions	93.2	91.9	90.9
Performing unhygienic body piercing	86.4	88.5	89.8
Sharing paraphernalia for cocaine sniffing	59.1	86.2*	85.2*
Sharing razors with others	84.1	83.9	85.2
Coughing and sneezing	35.2	12.6*	10.4*
Food preparation	12.5	6.8	10.2
Sharing eating utensils	46.6	20.9*	22.7*
Having unprotected sex	79.5	82.4	81.8

* p value < 0.05 between baseline and second evaluations, by McNemar's Test

Test HCV = Hepatitis C; IDUs= injecting drug user

Table 4

Pre- and post-intervention HCV severity perception and HCV risk behavior evaluation

HCV-infection issues	Day 0 Median(IQR)	8 th Week Median(IQR)	6 th Month Median(IQR)
HCV severity perception			
HCV infection is a severe disease	10.0 (7.0-10)	10.0 (8.0-10) *	10.0 (8.0-10)
HCV infection can cause death	7.0 (5.0-10)	6.0 (5.0-10)	6.0 (4.0-8.8)
HCV infection can cause liver cirrhosis	9.0 (6.0-10)	8.0 (6.0-10)	8.0 (5.0-10) *
HIV/HCV infection can cause death	10.0 (6.0-10)	8.0 (5.0-10)	8.0 (5.0-10) *
HCV infection can cause liver cancer	8.0 (5.0-10)	7.0 (5.0-10)	7.0 (5.0-9.0)
Injecting drug use risk behaviors in the previous 30 days (n = 20)			
Using a shooting gallery to inject drug	8.0 (0-10)	0 (0-8.0) *	0 (0-7.8) *
Utilizing water previously used by another IDUs	1.0 (0-8.8)	0 (0-4.0) *	0 (0-0) *
Utilizing cooker previously used by another IDUs	2.0 (0-9.0)	0 (0-6.25) *	0 (0-0) *
Utilizing filter or cotton previously used by IDUs	0 (0-6.8)	0 (0-2.75)	0 (0-0)
Collecting drug from a cooker after another IDUs	0 (0-7.2)	0 (0-2.0) *	0 (0-0)
Back loading syringes	0.5 (0-6.5)	0 (0-1.0)	0 (0-0)
Utilizing another IDUs's syringe	1.0 (0-5.3)	0 (0-0)	0 (0-0)

Score scale from 0 (none) - 10 (very high or very frequent)

* p value < 0.05 between baseline and the second or third evaluations, by Wilcoxon Test

HCV = Hepatitis C; IQR=Inter Quartile Rate; IDUs=Injecting drug user