

Housing and Multidisciplinary Care with HIV Treatment Programs Support Antiretroviral Adherence among HIV and Hepatitis C Co-infected Individuals

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Poster Number: WEPED855

Background

Hepatitis C virus (HCV) is both a risk factor for and common comorbidity associated with HIV. Individuals with HIV/HCV co-infection face serious health challenges including risk of end-stage liver disease and mortality. The purpose of this study was to compare socio-demographic and clinical characteristics between HIV/HCV co-infected and HIV mono-infected individuals and to determine covariates of optimal ART adherence among co-infected individuals enrolled in a large cohort of HIV-positive individuals in British Columbia, Canada.

Methods

The study utilizes survey data from the Longitudinal Investigations into Supportive and Ancillary Health Services (LISA) study collected between 2007 and 2010 by the British Columbia Centre for Excellence in HIV/AIDS. This cross-sectional data is linked with longitudinal clinical data through the provincial Drug Treatment Plan (DTP). HCV co-infection was determined through self-report. Optimal ART adherence was defined as $\geq 95\%$ based on pharmacy refill compliance. Multivariable logistic regression models compared optimal adherence by HIV/HCV co-infection, as well as independent covariates of optimal ART adherence among co-infected individuals.

Results

Of 912 individuals (28.2% women) included in this analysis, 536 (58.8%) were HIV/HCV co-infected. Optimal adherence ($\geq 95\%$) was attained by 76.2% of HIV mono-infected individuals and 50.7% of HIV/HCV co-infected individuals. In adjusted multivariable analysis, co-infected individuals were significantly more likely to have a history of IDU (adjusted odds ratio [AOR]: 20.8; 95% confidence interval [CI]: 11.2 to 38.5) and incarceration (AOR: 2.52; 95% CI: 1.41 to 4.51), and less likely to be optimally adherent (AOR: 0.53; 95% CI: 0.28 to 0.99). Optimal adherence among HIV/HCV co-infected participants was associated with stable housing (AOR: 1.86; 95% CI: 1.14 to 3.05) and accessing an adherence support program (AOR: 4.76; 95% CI: 2.62 to 8.57).

Table 1: Factors associated with HCV co-infection (multivariate logistic regression) (n=912).

	Adjusted Odds Ratio (95% Confidence Interval)	P-value
Sociodemographic Characteristics:		
History of injection drug use (yes vs. no)	20.80 (11.24 to 38.52)	<0.001
History of incarceration (yes vs. no)	2.52 (1.41 to 4.51)	0.002
Current injection drug use (yes vs. no)	2.40 (1.05 to 5.48)	0.038
Gender (female vs. male)	2.27 (1.18 to 4.37)	0.014
Life satisfaction	1.03 (1.01 to 1.04)	0.001
Overall function	0.99 (0.98 to 1.00)	0.080
Annual income \geq \$15000 (yes vs no)	0.60 (0.33 to 1.09)	0.093
Complete high school education (yes vs no)	0.59 (0.33 to 1.06)	0.078
Clinical Characteristics:		
Number of treatment interruptions	1.21 (0.98 to 1.50)	0.078
Months to viral suppression from ART initiation	0.99 (0.99 to 1.00)	0.222
VL at time of interview (per log10)	0.77 (0.55 to 1.08)	0.125
Treatment regimen: number of pills >1 per day	0.70 (0.39 to 1.25)	0.229
Adherence $\geq 95\%$ (yes vs no)	0.53 (0.28 to 0.99)	0.044

Table 2: Comparison of HIV/HCV co-infected participants by adherence in the year prior to the LISA interview (n=404).

	$\geq 95\%$ Adherence (n=205)	<95% Adherence (n=199)	P-value
Sociodemographic Characteristics			
Median age (1st-3rd quartile)	45 (40 to 52)	44 (38 to 49)	0.009
Male gender	135 (65.9%)	123 (61.8%)	0.398
Aboriginal ancestry	68 (33.2%)	80 (40.2%)	0.143
Education (completed high school)	90 (43.9%)	77 (38.7%)	0.269
Annual income \geq \$15000	49 (23.9%)	44 (22.1%)	0.709
Stable housing	114 (55.9%)	96 (48.2%)	0.125
History of incarceration	145 (71.4%)	154 (77.8%)	0.144
Experiencing depressive symptoms	132 (64.4%)	119 (59.8%)	0.342
History of illicit drug use	197 (97.0%)	195 (99.0%)	0.166
Current illicit drug use	132 (65.0%)	131 (66.5%)	0.756
History of injection drug use	187 (92.1%)	180 (91.4%)	0.786
Current injection drug use	74 (36.5%)	71 (36.0%)	0.932
High perceived stigma	108 (54.3%)	107 (54.0%)	0.963
Confirmed history of alcoholism	54 (27.0%)	65 (33.9%)	0.304
Median overall function (1st-3rd quartile)	43 (32 to 61)	46 (29 to 64)	0.725
Median life satisfaction (1st-3rd quartile)	69 (56 to 75)	72 (53 to 75)	0.722
Clinical Characteristics and Service Use:			
Treatment regimen: number of pills >1 per day	43 (21.2%)	46 (27.2%)	0.174
Median CD4 count at time of interview (1st-3rd quartile)	350 (220 to 530)	280 (160 to 420)	0.001
Median VL [log10 copies/ml] (1st-3rd quartile)	2 (2 to 2)	2 (2 to 4)	<0.001
VL suppression at time of interview	138 (69.7%)	81 (43.1%)	<0.001
ADI at baseline	25 (12.2%)	22 (11.1%)	0.721
Months to suppression (1st-3rd quartile)	14 (4 to 47)	23 (5 to 61)	0.032
Months of treatment (1st-3rd quartile)	76 (26 to 123)	77 (30 to 121)	0.789
Median number of VL monitoring tests/year (1st-3rd quartile)	5 (4 to 6)	4 (3 to 6)	0.001
Number of treatment interruptions (1st-3rd quartile)	1 (0 to 2)	2 (1 to 4)	<0.001
Median physician experience (1st-3rd quartile)	57 (18 to 138)	52 (14 to 128)	0.341
Daily ART refill	103 (50.5%)	69 (35.9%)	0.004
MAT access*	78 (38.0%)	27 (13.6%)	<0.001
Use of memory aids for medication	64 (31.4%)	54 (27.6%)	0.402
Number of co-infections other than HCV	2 (1 to 3)	1 (0 to 3)	0.23
Hepatitis A or B co-infection	86 (42.0%)	75 (37.7%)	0.382
Mental illness	140 (68.3%)	122 (61.3%)	0.141
Methadone treatment	88 (42.9%)	86 (43.2%)	0.953
Mortality, up to June 30, 2012	24 (11.7%)	16 (8.0%)	0.217

Table 3: Factors associated with ART adherence among HIV/HCV co-infected individuals (multivariate logistic regression) (n=404).

	Adjusted Odds Ratio (95% Confidence Interval)	P-value
MAT access (yes vs. no)*	4.76 (2.62 to 8.57)	<0.001
VL suppression at time of interview (yes vs. no)	2.39 (1.47 to 3.89)	<0.001
Stable housing (yes vs. no)	1.86 (1.140 to 3.05)	0.013
Mental illness (yes vs. no)	1.38 (0.85 to 2.26)	0.196
Number of VL monitoring tests/year	1.12 (1.01 to 1.25)	0.039
Months to suppression from ART initiation	1.01 (1.00 to 1.01)	0.169
History of incarceration (yes vs. no)	0.75 (0.44 to 1.29)	0.301
Number of treatment interruptions	0.71 (0.61 to 0.84)	<0.001

Conclusion

HIV/HCV co-infected individuals exhibit significantly lower ART adherence than HIV mono-infected individuals, however, stable housing and adherence support services were associated with improved adherence within this demographic. The findings highlight the importance of integrating adherence support and social services, such as housing outreach, with ART treatment programs for HIV/HCV co-infected individuals.

Acknowledgements

This work was made possible by scholarship funding to Cathy Puskas through the financial support of Merck Canada Inc.

