

Hepatitis C Virus Coinfection Is Associated with Higher Risk of Death Due to HIV and Liver-related Disease among an HIV-infected Cohort

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BACKGROUND

- HCV status is independently predictive of death in some studies but has either a neutral or protective effect in others.
- It is important to know how HCV impacts mortality in HIV+ patients because it guides how aggressively clinicians should pursue HCV treatment.
- The University of Washington HIV-specialty clinic located at Harborview Medical Center is largest provider of HIV care in Northwest U.S., with a special commitment to uninsured, incarcerated and substance abusing patients.

RESEARCH QUESTIONS

- Do HIV/HCV coinfectd patients have a higher mortality rate than HIV+ patients without HCV coinfection?
- What are the causes of death in HIV/HCV coinfectd patients?
- What are the predictors of death in HIV/HCV coinfectd patients?

METHODS

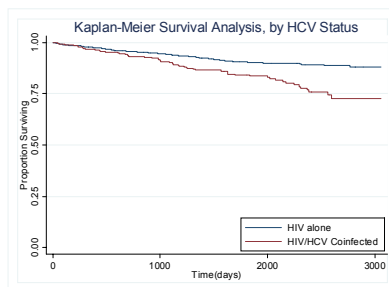
- Design: retrospective cohort study of all HIV/HCV coinfectd patients in the UW HIV cohort (1997-2005)
- Inclusion criteria: confirmed HIV infection, first clinic visit between 1/1/97-10/30/04, at least 2 visits over 12 month period, HCV EIA+ or HCV RNA+
- Data source: The University of Washington HIV Information System (UWHIS) captures comprehensive clinical data for the UW HIV cohort from 1995 to the present. These data include comprehensive laboratory test results, pharmacy dispensing data, clinical encounter data including inpatient and outpatient diagnoses, and historical information collected at time of enrollment by standardized intake process. Cause of death determined by death certificates or manual chart review.
- Kaplan-Meier survival analysis of death rates in patients with and without HCV coinfection
- Predictors of death in HIV/HCV coinfectd patients determined by Cox proportional hazards model with time-dependent covariates

RESULTS

Table 1. Comparison of Subjects with and without HIV/HCV Coinfection

Characteristic	HIV/HCV (N=369)	HIV (N=1461)	P
Sex (male) - n (%)	281 (76)	1251 (86)	<0.001
Mean age at first visit - yr ± SD	40 ± 7	36 ± 8	<0.001
Race/Ethnicity - n (%)			0.12
White	246 (67)	908 (62)	
Black	77 (21)	307 (21)	
Latino	27 (7)	169 (12)	
Other	19 (5)	77 (5)	
Diagnosis of any psychiatric illness - n (%)	272 (74)	904 (62)	<0.001
Diagnosis of any substance abuse - n (%)	314 (85)	677 (46)	<0.001
AIDS defining illness - n (%)	169 (46)	581 (40)	0.04
Mean CD4 count - cells/ml ± SD	350 ± 273	375 ± 265	NS

Figure 1. Survival Curve of HIV+ Patients with and without HCV Coinfection, 1997-2004



Mortality rate in HIV+ patients with HCV = 3.8 per 100 person-years
 Mortality rate in HIV+ patients without HCV = 1.9 per 100 person-years
 P < 0.001

Figure 2. Causes of Death in HIV/HCV Coinfectd Patients (N=60)

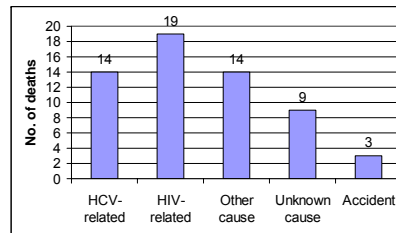


Table 2. Characteristics of HIV/HCV Coinfectd Patients Who Died Versus Those Who Did Not

Characteristic	Died (N=60)	Lived (N=309)	RR (95% CI)
Sex			
Male	45 (75)	242 (78)	0.8 (0.5-1.5)
Race/ethnicity			Ref
White	33 (55)	209 (68)	
Black	18 (30)	59 (19)	1.7 (1.0-2.9)
Hispanic	5 (8)	22 (7)	1.4 (0.6-3.2)
Alaska Native/American Indian	4 (7)	17 (6)	1.4 (0.5-3.6)
Age (years, at first visit)			Ref
<30	1 (2)	8 (3)	
30-39	14 (23)	80 (26)	1.3 (0.2-9.1)
40-49	28 (47)	164 (53)	1.3 (0.2-8.6)
≥50	17 (28)	57 (18)	2.1 (0.3-13.7)
Opportunistic infection	39 (65)	130 (42)	2.2 (1.4-3.6)
HAART ever	9 (15)	244 (79)	0.1 (0.04-0.2)
Most recent CD4 count <200 cells/ml	35 (60)	72 (24)	3.6 (2.3-5.9)
Most recent HIV RNA, copies/ml*			Ref
<500	19 (33)	149 (49)	
500-10,000	13 (23)	53 (17)	1.9 (0.9-4.20)
>10,000	25 (44)	103 (34)	1.9 (1.0-3.7)
Any Mental Health Diagnosis	47 (78)	225 (73)	1.3 (0.7-2.3)
Any Substance Abuse Diagnosis	51 (85)	259 (84)	1.1 (0.6-2.1)

* Chi-squared test for trend = 1.89, NS

† Chi-squared test for trend = 3.9, p = 0.05

Table 3. Predictors of Death in HIV/HCV Coinfectd Patients (N=60)

Characteristic	Univariate		Multivariate	
	HR (95% CI)	P	HR (95% CI)	P
Male sex	1.1 (0.6-2.0)	0.70
Age (10 year increments)	1.5 (1.1-2.1)	0.02	1.5 (1.0-2.2)	0.06
Black race	1.3 (0.8-2.3)	0.30
History of substance abuse	1.0 (0.5-2.0)	0.94
History of mental health diagnosis	1.0 (0.5-1.8)	0.88
CD4 count < 200 cells/ml	4.6 (2.8-7.9)	<0.001	2.1 (1.1-4.0)	0.02
HIV RNA (copies/ml)				
<500	Ref		Ref	
500-10,000	1.5 (0.8-3.1)	0.25	0.9 (0.4-2.0)	0.78
>10,000	2.0 (1.1-3.6)	0.03	0.9 (0.5-1.9)	0.83
HAART	0.3 (0.2-0.6)	0.001	0.3 (0.1-0.7)	0.005
Opportunistic infection	2.5 (1.5-4.3)	0.001	1.3 (0.7-2.4)	0.46
Bilirubin (mg/dL)				
<2	Ref		Ref	
2-3	4.0 (1.5-10.2)	0.004	2.6 (0.9-7.5)	0.07
>3	35.4 (8.4-64.5)	<0.001	9.8 (4.6-20.8)	<0.001
Albumin (g/dL)				
>3.5	Ref		Ref	
2.8-3.5	2.4 (1.1-5.6)	0.04	1.4 (0.6-3.4)	0.47
<2.8	10.0 (4.4-22.7)	<0.001	10.0 (4.4-22.7)	<0.001
ALT (U/L)				
<2 x upper limit of normal	Ref		Ref	
2-5 x upper limit of normal	1.2 (0.5-2.6)	0.69	1.7 (0.7-4.1)	0.21
>5 x upper limit of normal	3.0 (1.1-8.3)	0.04	5.3 (1.7-16.7)	0.005

CONCLUSIONS

- HIV+ patients coinfectd with HCV had two times the death rate than those without HCV infection
- Liver disease was the cause of death for nearly one-quarter of the coinfectd patients who died
- CD4 count <200 cells/ml, markers of poor synthetic function and hepatic inflammation are significant predictors of death in HIV/HCV coinfectd patients.
- HIV/HCV coinfectd patients who died were less likely to have ever taken HAART than coinfectd patients who were alive.

Future Directions: Adjustment for baseline differences in HCV+ and HCV- groups in explaining mortality differences.

Acknowledgements: This study was supported by a research grant from Bristol Myers-Squibb Virology.