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Short communication

An anonymous unlinked sero-prevalence survey of HIVHCV in an urban Emergency Department

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ABSTRACT

Background: In 2002, the sero-prevalence of human immunodeficiency virus-1 (HIV) in the Emergency Department (ED), University Hospital, Newark, New Jersey was 10.4%. Both HIV and hepatitis C virus (HCV) are transmitted by injection drug use (IDU) or sexual contact. However, the degree of concurrent positive HCV antibody status in HIV-infected ED patients is unknown.
Objectives: In this study we determined the sero-prevalence of HIV and HIVHCV in HIV-positive patients in the ED.
Study design: A cross-sectional study using an anonymous sero-prevalence survey was conducted from 7/1/2008 to 8/23/2008. Medical records were reviewed and de-identified; remnant blood specimens were also de-identified and tested for HIV antibody, and if positive, HCV antibody.
Results: Of 3488 specimens, 225 (6.5%, 95% CI: 5.7–7.3%) were positive for HIV antibody. Seventy-four patients 74/225 (32.9%, 95% CI: 33.8–46.5%) were unaware of their sero-positivity. Forty percent of HIV positive patients (90/225, 95% CI: 33.8–46.5%) were HCV antibody positive. The highest seroprevalence of HIVHCV antibody was among older patients (≥45 years), and patients with positive urine toxicology and elevated liver function tests.
Discussion: Given the high prevalence of HIV and HIVHCV antibody in the ED, routine testing is important for patients ≥45 years with positive urine toxicology and elevated liver function tests.

1. Background

Since potent anti-retroviral medications became available in the mid-1990s, human immunodeficiency virus-1 (HIV) infected patients are living longer. Consequently, other chronic conditions have emerged which complicate their medical status. Among other complications, hepatitis C (HCV) co-infection results in an increased progression of hepatic fibrosis [1,2]. The resultant liver disease is a leading cause of death among patients with well-controlled HIV [3,4].

Estimates of HCV prevalence in the United States range from 1.6% to 2.0% with 4.1–5.2 million infections [5,6]. Among HIV-infected persons, 15–30% are living with HCV, however, in some geographic areas, higher co-infection rates occur [7–9]. In 2008, New Jersey (NJ) ranked first nationally in the number of reported HCV cases and had 35,309 living HIV-diagnosed persons [10,11]. Common routes of HIV and HCV transmission include injection drug use (IDU) and sexual contact [12,13].

A previous anonymous unlinked sero-survey (AUS) reported 10.4% HIV-prevalence in Emergency Department (ED) patients, at University Hospital, Newark [14]. Given the reported sero-prevalence rate of HIV, unbiased estimates of HIVHCV will be useful in understanding the relationship between these two diseases. This will assist in developing strategies to improve outcomes among co-infected patients.

Abbreviations: AIDS, acquired immunodeficiency syndrome; ALT, alanine aminotransferase; AST, aspartate aminotransferase; AUS, anonymous unlinked sero-survey; CI, Confidence Interval; ELISA, Enzyme-Linked Immuno-Sorbent Assay; ED, Emergency Department; HCV, hepatitis C virus; HIVHCV, human immunodeficiency virus–hepatitis C virus; HIV, human immunodeficiency virus-1; IDU, injection drug use; LFT, liver function tests; NIDU, non-IDU; NJ, New Jersey.

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Table 1
Characteristics of patients by HIV antibody status.

Characteristics	Total tested 3488 *n* (%)	HIV negative *n* (%) 3263(93.5)	HIV positive *n* (%) 225(6.5)
Known HIV status			
No			74(32.9)
Yes			151(67.1)
HCV			
No			135(60.0)
Yes			90(40.0)
Age			[a]
≤34	1083(31.0)	1055(32.3)	28(12.4)
35–44	816(23.4)	730(22.4)	86(38.2)
45–54	746(21.4)	674(20.7)	72(32.0)
≥55	843(24.2)	804(24.6)	39(17.4)
Sex			
Female	1781(51.1)	1665(51.0)	116(51.6)
Male	1707(48.9)	1598(49.0)	109(48.4)
Race/ethnicity			[a]
Other	934(26.8)	907(27.8)	27(12.0)
Non-Hispanic Black	1898(54.4)	1718(52.7)	180(80.0)
Hispanic Black	656(18.8)	638(19.5)	18(8.0)
Positive urine toxicology			[a]
No	1124(32.2)	1036(31.8)	88(38.8)
Yes	585(16.8)	480(14.7)	105(47.1)
Missing	1779(51.0)	1747(53.5)	32(14.1)
Elevated LFT			[a]
No	3111(89.2)	2932(89.9)	179(79.6)
Yes	377(10.8)	331(10.1)	46(20.4)

[a] Comparison of HIV negatives vs. HIV positives, statistically significant at $p \leq 0.05$.

2. Objectives

The objectives for this study were to determine the sero-prevalence of HIV and HIVHCV co-infection among subsets of ED patients.

3. Study design

This cross-sectional study was conducted from 7/1/2008 to 8/23/2008 in an urban ED located in Newark, NJ, among patients ≥18 years, who provided blood specimens as part of routine medical care. An AUS was conducted to eliminate participation bias and obtain accurate assessments of HIVHCV antibody in sub-sets of the population [15].

3.1. Selection of specimens

After routine laboratory testing, residual serum specimens from patients' ≥18 years seeking medical care in the ED were collected. Only one specimen per patient was collected and stored at −80 °C.

3.2. Data handling

Data were abstracted from the medical record. A unique identifier was assigned to each observation and personal identifiers were deleted from the database. Correlates of antibody status included demographic (age, sex, race/ethnicity) and clinical indicators of health status (positive urine toxicology: heroin or cocaine, liver function tests (LFT): AST (aspartate aminotransferase) and ALT (alanine aminotransferase).

3.3. Testing for HIV and HCV antibody

Specimens were thawed, de-identified, assigned a unique identifier, and tested using HIV Enzyme-Linked Immuno-Sorbent Assay (ELISA) (Bayer Healthcare LLC, Tarrytown, New York) and if reactive Western Blot (BIO-RAD, Hercules, California) [16,17]. If both ELISA and Western Blot tests were positive for HIV, HCV antibody testing was performed (Abbott Laboratories, Abbott Park, Illinois) [18]. Test results were then merged with the abstracted data using the unique identifier to create the study database.

4. Statistical analysis

Proportions were compared between patients testing positive vs. negative for HIV antibody and both HIVHCV antibodies vs. HIV mono-infected patients using chi-square. p values ≤0.05 were considered statistically significant. Sero-prevalence of HIVHCV was evaluated in subsets of the sample. Two indices were constructed: positive urine toxicology (cocaine or heroin) and elevated LFT: (ALT (≥34 IU/L) or AST (≥33 IU/L)). Statistical Analysis Software version 9.2 (Cary, North Carolina) was used to analyze the data.

5. Results

Discarded blood specimens were collected from 3488 patients treated at the ED from 7/1/2008 to 8/23/2008 (see Fig. 1). Overall, the seroprevalence of HIV antibody was 6.5% (95% Confidence Interval (CI): 5.7–7.3%). Among HIV-positives, 74 (32.9%, 95% CI: 26.8–39.0%) were unaware that they were seropositive. When compared to HIV-negative patients, HIV-positives were older (Fig. 2) with a positive urine toxicology and elevated LFT (see Table 1). Forty percent of HIV-positive patients, 90/225 (95% CI: 33.8–46.5%) were HCV antibody positive. HIVHCV seroprevalence was highest for patients aged 45–54 and ≥55 (see Fig. 3), with a positive urine toxicology and elevated LFT (see Table 2).

6. Discussion

The prevalence of HIV in this ED declined from 10.4% to 6.5% from 2002 to 2008 [14]. The reasons for this decline are unclear but may be due to the availability of better tolerated antiretroviral