The burden of hepatitis C infection in Pennsylvania state prisons and implications for treatment

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Introduction

•Globally, numerous studies report a higher prevalence of hepatitis C virus (HCV) infection among prisoners than in the general population.

•There is little recent national data reporting the prevalence of HCV among female prisoners.

•Few studies have investigated the prevalence of various genotypes among HCV-infected prisoners, which is important for guiding treatment and predicting achievement of sustained virologic response (SVR).

•The development of new agents for the treatment of HCV makes this a particularly relevant time to further characterize the disease among an incarcerated population.

•The Pennsylvania Department of Corrections (DOC) is one of few state prison systems to implement universal screening for HCV of all incoming prisoners.

Objectives

•To determine the seroprevalence of HCV among a prison population

•To characterize the burden of infection among prisoners by measuring evidence of chronic infection and the prevalence of various viral genotypes

Methods

Setting

•The Pennsylvania DOC performs opt-out screening of all incoming persons for markers of exposure to HCV (HCV antibody).

•Positive tests are confirmed by testing for HCV RNA by PCR, which is offered to all inmates who qualify for treatment. The main exclusion criterion for treatment eligibility is short sentence duration.

•Prisoners with confirmed infections are entered into formal protocol for evaluation, genotype testing, education, treatment, and immunization for hepatitis A and B.

Data

•We performed a secondary data analysis of the HCV antibody test results for all adults entering the state prisons from 2004-2012, in total and stratified by gender and year of incarceration.

•Each prisoner was given a unique identifier to account for recidivism or retesting.

•We obtained 130,495 unique test records for 101,727 individuals.

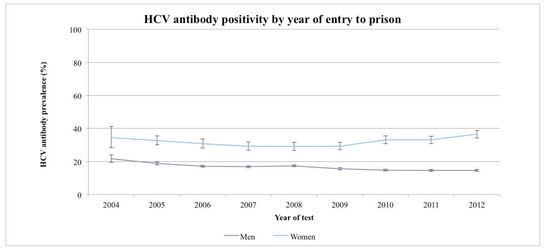
Results

Overall seroprevalence of HCV antibody

Any positive result for HCV antibody				
	n tested	*n* HCV-antibody +	% (95% CI)	Risk ratio (95% CI)
All persons	101, 727	18,454	18.1 (17.9, 18.4)	
Gender				
Men	92,193	15,468	16.8 (16.5, 17.0)	ref.
Women	9,534	2,986	31.3 (30.4, 32.3)	1.87 (1.81, 1.93)
Test years				
2004-2006	17,604	3483	19.8 (19.2, 20.4)	ref.
2007-2009	40,178	7170	17.8 (17.5, 18.2)	0.90 (0.86, 0.94)
2010-2012	42,477	7058	16.6 (16.3, 17.0)	0.84 (0.81, 0.87)

•Of 101,727 persons tested, 18,454 (**18.1%**) had at least one positive test
•**The seroprevalence among women (31.3%) was almost twice that among men (16.8%)**

HCV antibody prevalence decreased over time



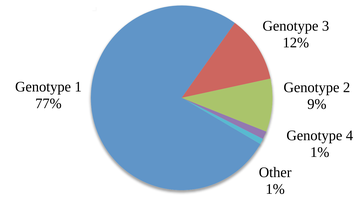
•This trend was attributable to the decline in prevalence among men
•**No such trend was observed among women**

Prevalence of HCV RNA among those with evidence of exposure to HCV

Year of first testing	*n* tested	*n* (%) with detectable viral load
2004	343	219 (63.9)
2005	1593	1067 (67.0)
2006	1324	792 (59.8)
2007	972	590 (60.7)
2008	1087	617 (56.8)
2009	1385	861 (62.2)
2010	1313	762 (58.0)
2011	1226	684 (55.8)
2012	1282	757 (59.1)
n ever positive	7633	5288 (69.3)

•Of 18,454 individuals with positive screening tests, 7633 (41.4%) underwent confirmatory PCR testing
•**69.3% of those tested had at least one positive result**

Prevalence of viral genotypes



•Of 5426 prisoners with detectable viral loads, 3247 (59.8%) underwent genotype testing
•**77% were infected with genotype 1**

Discussion

•The overall seroprevalence of 18.1% is much higher than an estimated prevalence of 1.3% for non-institutionalized Americans.[1] It is within the expected range based on a recent global review.[2]

•Seroprevalence in men declined over time, reflecting a national trend.[1] Notably, this decrease was not seen among incarcerated women.

•A survey of non-institutionalized Americans reported that 67% of HCV-exposed persons were chronically infected[1], similar to our findings in an incarcerated population (70%). Our results should be viewed with caution, however, as only 41% of the HCV-antibody positive patients completed HCV RNA testing and any treatment history is unknown.

•The same national survey reports that 68% of those chronically infected have genotype 1[1], compared with 77% of our study participants.

•The disproportionate incarceration of those with histories of substance use, mental illness, and those living in poverty likely contributes to the extremely high burden of HCV among prisoners.[4]

•New, more effective, interferon-free therapies of short duration provide the opportunity to achieve SVR among incarcerated patients. Shortened treatment courses are particularly important for women in prisons, who historically have shorter sentences[5], and, therefore, are more likely to be ineligible for treatment.[6]

Conclusions

•The burden of HCV among prisoners is extremely high, particularly among women.

•The rate of chronic infection after HCV exposure is similar to that reported in the general population, as is genotype distribution.

•The high concentration of infection makes prisons high-yield venues for HCV testing and treatment, especially among patients who may have relatively increased access to healthcare while incarcerated and who may be at risk of forward transmission.

References

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