Identifying an HIV and Neuro/Ocular Syphilis Cluster in Vermont

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Background

Syphilis cases on the rise in the United States

- The number of primary and secondary syphilis cases has been rising dramatically in the past decade in the U.S. There were just over 8,700 cases in 2005 and then greater than 35,000 cases reported in 2018, which represents the highest rate since 1993[1,2,3]
- Considerable research supports that the rise in syphilis cases is largely secondary to an increase in risky sexual behaviors among men who have sex with men (MSM) populations and illicit substance abuse, including methamphetamine[4,5]

Syphilis and HIV

- Syphilis infection facilitates HIV acquisition likely through both biological and behavioral factors[6,7]
- National public health interest in ocular syphilis, a clinical manifestation of neurosyphilis, rose after a cluster of cases occurred in 2014-2015 along the West coast of the U.S. with the majority of cases occurring among HIV-infected men who have sex with men (MSM) [8]
- The Vermont Department of Health (VDH) and University of Vermont Medical Center (UVMMC) recognized a cluster of neuro- and ocular syphilis cases among newly identified cases of HIV among MSM across Vermont in 2017-2018

Objectives

1. Identify all individuals infected with HIV in 2017 and 2018 in Vermont
2. Describe characteristics, including syphilis infection status, HIV staging, and behavioral and sexual risk factors, among individuals newly infected with HIV

Methodology

- HIV data reported to the Vermont Department of Health (VDH) are housed in the Enhanced HIV/AIDS Reporting system (eHARS), a CDC-supplied HIV surveillance system
- Disease Intervention Specialists (DISs) interviewed newly diagnosed cases of HIV and syphilis, conducted outreach to all sexual contacts and pursued sexual networking analyses
- A specialist in Infectious Diseases at UVMMC conducted a detailed chart review of electronic medical records of patients diagnosed with HIV during 2017-2018
- Descriptive statistics summarized patient characteristics with Fishers-exact and independent t-tests to compare cluster versus non-cluster groups

Results

HIV

- Between January 1, 2017 and December 31, 2018, 38 newly diagnosed cases were identified in Vermont (Figure 1, Table 1)
- 47% had viral loads >100,000 copies/mL and 47% had CD4 cell counts <200/µL

Neuro- and ocular syphilis

- 29% of newly identified cases with HIV had a positive syphilis serology, with 11% meeting clinical definition of either neuro- or ocular syphilis

Cluster

- Sexual networking analysis revealed a cluster of ten cases of HIV (Figure 2), of whom seven reported methamphetamine use, seven had CD4 cell counts <200/µL, nine had viral loads >100,000 copies/mL and three had either neuro- or ocular syphilis
- DIS efforts further characterized sexual partnerships and methamphetamine use among several members of the cluster (Figure 2)

Table 1. Demographic characteristics of study population (n=38)

Age (years)	**n (%)**
19-26	9 (24)
27-34	8 (21)
35-42	8 (21)
43-50	3 (8)
51-58	4 (11)
59-66	6 (15)
Gender	
Female	8 (21)
Male	30 (79)
Race	
Non-Hispanic White	29 (76)
Hispanic White	2 (5)
Black	4 (11)
Asian	3 (8)
County	
Rural	22 (58)
Urban	16 (42)
Risk Factors for HIV Acquisition	
MSM	30 (79)
People who inject drugs	4 (11)

Results

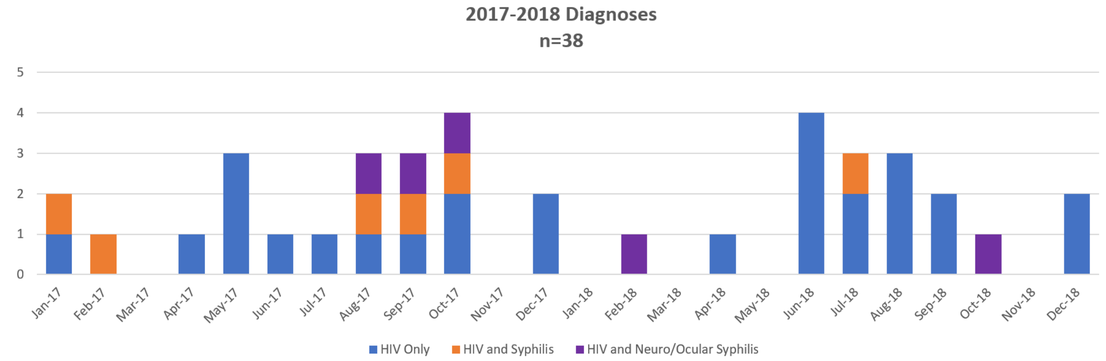

Figure 1. Numbers of cases of HIV, syphilis and both infections by month over 2017 and 2018

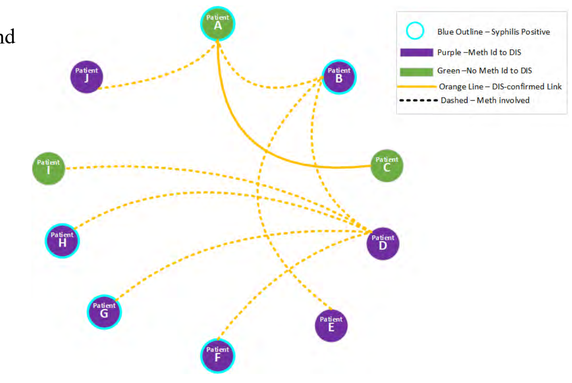

Figure 2. Cluster of 10 cases of HIV infection

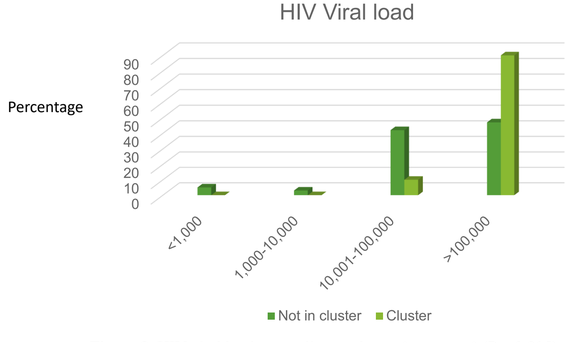

Figure 3. HIV viral loads according to cluster (yes vs. no) (P = 0.015)

Conclusion

- This investigation of 38 newly infected cases of HIV in the rural state of Vermont led to identification of a cluster of 10 cases that were more likely have higher viral loads than those not in the cluster (P = 0.015) (Figure 3). Of those in the cluster, 90% had viral loads >100,000 copies/mL at diagnosis and 30% had manifestations of neurosyphilis or ocular syphilis

Limitations/ Future Directions

Limitations

- Data presented here is based on a combination of DIS-gathered historic data and electronic chart review and do not fully elucidate sexual behaviors and practices

Future directions for research

- Pursue phylogenetic and network analyses on the HIV polymerase sequences of infected cases

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