False Positive Human Immunodeficiency Virus Testing Associated with Acute Hepatitis A Infection: A Case Series

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BACKGROUND

- In our urban, medically underserved patient population, Human Immunodeficiency Virus (HIV) is hyper-endemic, and HIV screening is frequently performed. Although HIV screening tests have high specificity (99.91%), false positives can occur. False positive have been associated with vaccinations, autoimmune diseases, and viral infections. In 2019, Philadelphia experienced a large Hepatitis A (HAV) outbreak, during which false positive HIV screening tests were discovered. We describe patients who were diagnosed with acute Hepatitis A infection in whom false positive HIV testing had occurred.

OBJECTIVES

- To determine the incidence of true and false positive HIV 4th generation test results among patients with acute hepatitis A during the HAV epidemic.
- To determine if false positive results were NOT present before and after the occurrence of acute HAV.
- To determine if false positive results coincided with significant elevations of liver enzymes.

METHODS

- **Retrospective chart review** of adult patients admitted to our hospital between January 2017 and December 2019 who had a positive Hepatitis A Virus IgM. Demographics described in Table 1.
- **Definition:** A false positive HIV test was defined as a positive HIV screen (p24 antigen and HIV-1 and 2 antibody combination), followed by absence of detectable HIV-1 and 2 antibodies, and a negative HIV PCR.
- **Statistic:** the probability that the observed number of false positive HIV results would occur in our sample of HIV-negative hepatitis patients, assuming accepted HIV test specificity, was calculated using a standard normal approximation to the binomial variable: true vs false negative.

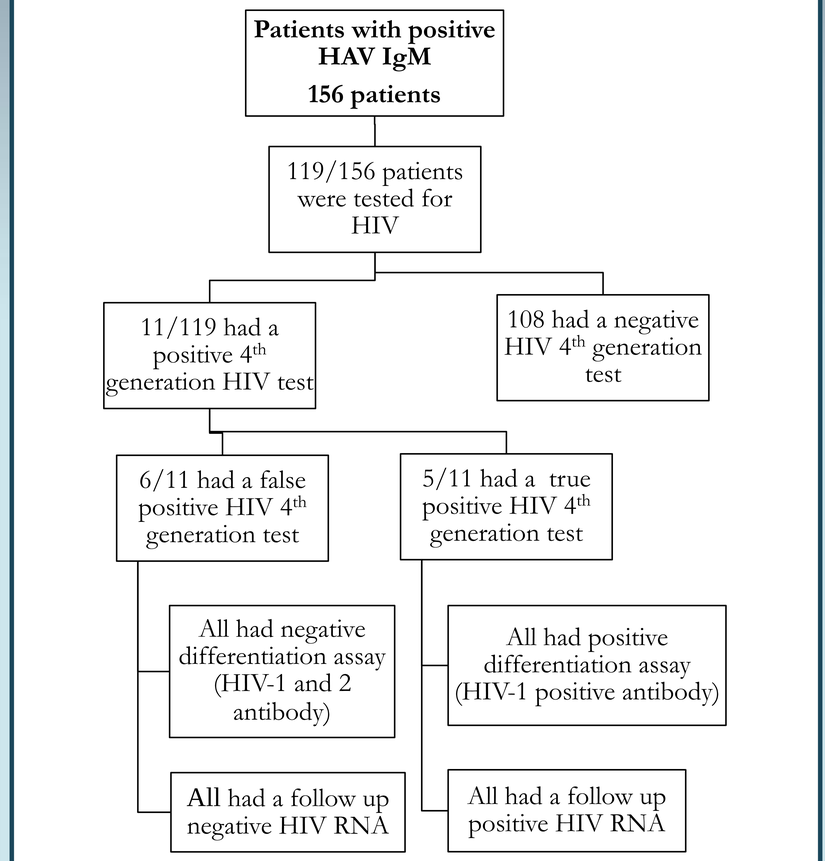

Figure 1: Flow chart of patient population included with positive HAV IgM

Patient	Age	Gender	PWID	Positive for Hepatitis C	Positive Hepatitis C RNA
1	40	M	Yes	Yes	Yes
2	42	M	Yes	Yes	Cleared
3	47	F	No	Yes	Cleared
4	36	M	No	No	N/A
5	33	M	Yes	Yes	Yes
6	54	F	No	No	N/A

Table 1: Demographic data of the 6 patients that had a false positive HIV 4th generation test. M (male), F (female). PWID (person who injects drugs). N/A (not applicable. Cleared- refers to cleared hepatitis C infection

ANALYSIS

- In our population of 114 hepatitis A patients who were HIV negative, there were 6 false positive results. The probability of this many false positive results occurring in this patient group, assuming the accepted test specificity of 99.91% is < 0.00001.

RESULTS

- A total of 156 unique patients were found to have acute HAV. Of these, 119 were tested for HIV out of which11 had a positive 4th generation HIV test and within this group 6 had a false positive HIV 4th generation test. (Figure 1)
- 4 of these 6 patients had a prior negative HIV test. Two had a follow up negative HIV test performed at a later admission.
- Both Hepatitis A testing and HIV testing were performed the same day or within 12 hours.
- 4 out of 6 patients were admitted with the diagnosis of acute hepatitis A with liver ultrasound findings reporting fibro-fatty changes and hepatomegaly.
- 5 out of 6 patients had abnormalities on liver function testing with a mean AST and ALT of 988 IU/L and 1008 IU/L respectively. Mean total bilirubin was 8.3mg/dl. Mean prothrombin time was 19 sec.
- Only one patient had a documented influenza immunization within the 6 months prior to HIV and HAV testing.

CONCLUSION

- To our knowledge, this is the first report of false positive HIV testing related to acute HAV. Although the prevalence of false positives was low, awareness of this phenomenon can facilitate patient counseling when a screening HIV test is positive in this setting.

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