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Hepatitis A surveillance using commercial laboratory data

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Objective

To evaluate the use of commercial laboratory data for monitoring trends in HAV infections over time and identifying geographic and demographic characteristics of HAV case clusters for the purpose of targeting interventions.

Introduction

Hepatitis A virus (HAV) infections have persisted in the United States despite the availability of an effective vaccine. Recent outbreaks of HAV infections among unvaccinated adults attributed to consumption of HAV-contaminated food, or person-to-person contact in certain populations (e.g., men who have sex with men) or settings (e.g., homeless shelters) have emphasized the importance of targeted vaccination of at-risk adults.

Methods

We used commercial laboratory data from Quest Diagnostics (Quest) and Laboratory Corporation of America (LabCorp) to identify unique individuals within each database who tested positive for HAV IgM antibody (indicative of acute HAV infection) from January 2011 through June 2017. Though de-depulication across the two laboratories was not possible, comparison of case characteristics indicated limited possible overlap of cases (<0.5%) and thus data from the two laboratories were combined. Demographic characteristics associated with the first positive test were used to classify cases by age, gender, state of residence, insurance type, and provider specialty. Persons co-infected with hepatitis B and/or hepatitis C were identified based on positive test results for hepatitis B surface antigen and hepatitis C RNA, respectively.

Results

A total of 6,702,256 HAV IgM test results from Quest and 7,043,555 HAV IgM test results from LabCorp were processed. Of those, 24,697 (0.4%) and 13,785 (0.2%) tests, respectively, had a 'Reactive', or positive result, indicating acute HAV infection. From these test results, we identified 15,415 unique individuals from Quest and 10,622 unique individuals from LabCorp with an acute HAV infection between January 2011 and June 2017. Among the 26,037 acute cases, the majority were female (14,056; 54.0%), were aged 50 or older (13,940; 53.5%), resided in large central or fringe metropolitan areas (17,842; 68.5%), and had tests ordered by family or internal medicine providers (12,358; 47.5%; Table). We identified 330 cases (1.3%) among incarcerated persons. Although data could not be de-duplicated across labs, we estimated a minimum of 630 persons (2.4%) were co-infected with hepatitis B and 852 persons (3.3%) were co-infected with hepatitis C. From 2011 to 2015, there were 7,370 cases of acute HAV reported to CDC, whereas Quest and LabCorp test results indicated 19,822 cases over the same time period. Trends in cases by month revealed seasonal increases in cases in late summer and early fall months (Figure 1). Mapping of acutely-infected individuals demonstrated a range of cases from 0 to 1,119 cases by county over the study period (Figure 2).

Conclusions

HAV IgM test results over a 6-year period from two commercial laboratories serving the United States suggest continuing hepatitis A transmission. Most cases occur among older adults, and appear to cluster geographically in metropolitan areas. Commercial laboratory data is a useful tool for supplementing case-based surveillance and informing prevention efforts.

Characteristics of acute HAV cases

Characteristic	N	%
Total	26,037	
Gender		
Female	14,056	54.0
Male	11,946	45.9
Missing	35	0.1
Age		
0-17	1,488	5.7
18-29	3,913	15.0
30-39	3,249	12.5
40-49	3,430	13.2
50-59	4,733	18.2
60-69	4,424	17.0
70+	4,783	18.4
Missing	17	0.1
Incarcerated		
Yes	330	1.3
No/unknown	25,707	98.7
Provider Specialty		
Addiction Medicine	30	0.1
Emergency Medicine	142	0.5
Gastroenterology/Infectious Disease	1,271	4.9
Family/Internal Medicine	12,358	47.5
Obstetrics/Gynecology	680	2.6
Other	5,215	20.0
Missing	6,341	24.4
Coinfection		
Hepatitis B	630	2.4
Hepatitis C	852	3.3
No/unknown	24,555	94.3

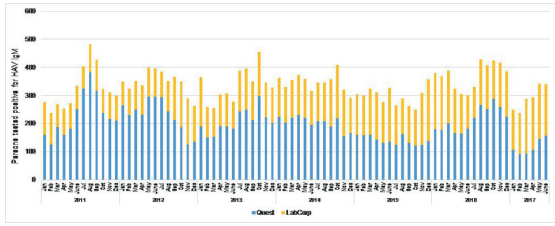

Figure 1. Monthly total number of persons tested positive for acute HAV infection

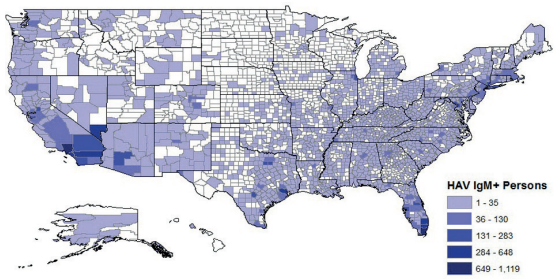

Figure 2. Geographic distribution of persons who tested positive for acute HAV infection

Keywords

big data; viral hepatitis; surveillance

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