Case Finding of Acute Hepatitis C after Implementation of a New Hepatitis C Registry — Arkansas, 2013

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Background

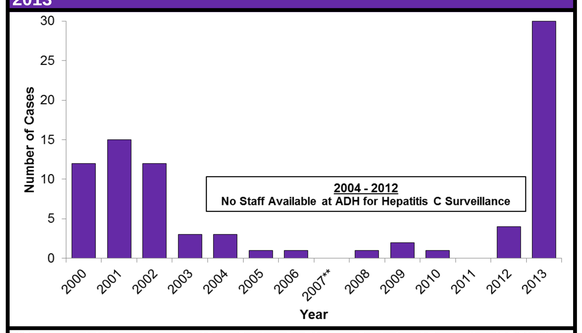
- Hepatitis C virus (HCV) is the most common bloodborne viral infection in the United States.
- The acute phase of HCV infection occurs within the first 6 months after exposure and results in symptoms in 20% – 30% of persons infected. Table 1 outlines the case definition.
- Among persons infected with HCV, 75% – 85% of persons develop chronic HCV infection, 60% – 70% develop chronic liver disease, and 5% – 20% develop cirrhosis.
- In the United States, HCV is the leading cause of hepatocellular carcinoma and the leading reason for liver transplant.
- One objective outlined in Healthy People 2020 is to reduce new HCV infections to an incidence rate of 0.25 cases per 100,000.[1]
- ADH receives HCV reports from several sources, including laboratories and physicians.
- Less than 5 cases of acute HCV were identified each year from 2003 – 2012 (Figure 1).
- In 2013, ADH expanded surveillance for acute and chronic HCV to characterize current transmission modes, risk behaviors, and demographics of newly acquired HCV cases

Table 1. Council of State and Territorial Epidemiologists (CSTE) Case Definition for Acute HCV*

Confirmed Case Definition	• Both of the following criteria: 1. Discrete onset of any symptom(s) consistent with HCV (fever, nausea, vomiting, malaise, abdominal pain, grey-colored stools, dark urine) 2. Jaundice OR Alanine Aminotransferase (ALT) ≥400 International Units/Milliliter (IU/mL) OR • Seroconversion to HCV infection with laboratory evidence of a negative HCV antibody result ≤6 months before a positive result

*Source: 2012 CSTE Position Statement Number 11-ID-05.

Figure 1. Acute Hepatitis C Virus Infection — Arkansas, 2000 – 2013



*Case count data was accessed from Centers for Disease Control and Prevention (CDC) Atlas tool for years 2000-2008 (Accessed from: http://www.cdc.gov/NCHHSTP/Atlas/). Data from 2009-2013 was accessed from case count data stored in the Arkansas National Electronic Disease Surveillance System (NEDSS).
**Case count data from 2007 was unavailable from either source.

Methods

- From January 1 – December 31, 2013, all HCV reports received by ADH through notifiable disease reporting were reviewed
- Reports noting any sign or symptom of acute HCV (Table 1) were electronically recorded in the National Electronic Disease Surveillance System (NEDSS) and assigned to ADH Communicable Disease Nurse Specialists for investigation
- All cases aged <30 years were recorded in NEDSS and reporting physicians were contacted to complete a case investigation form
- Investigation results were reviewed to determine if they met the acute case definition (Table 1) and recorded in NEDSS
- Data from acute cases detected by surveillance in 2013 were reviewed to describe acute HCV in Arkansas and determine the utility of investigating HCV among persons aged <30 years to enhance detection of acute HCV
- Acute HCV incidence was calculated to assess proximity to the Healthy People 2020 target of 0.25 cases per 100,000 persons
- The burden of acute HCV in Arkansas was estimated using methodology to account for asymptomatic infections, unidentified cases due to absence of physician evaluation, and underreporting to public health entities[2]

Results

Figure 2. Acute Hepatitis C Virus (HCV) Investigations and Burden — Arkansas, 2013

- Among 845 investigations, 22 acute cases were identified through follow-up of symptomatic persons while 8 acute cases were identified through case investigation of persons aged <30 years (Figure 2)
- The acute HCV incidence rate for 2013 was 1.0 cases per 100,000 persons
- Using methodology from Klevens et al.[2], it is estimated that there were at least 402 new HCV infections in Arkansas in 2013

Table 2. Characteristics of Acute Hepatitis C Cases —Arkansas, 2013

Characteristic	Number of Cases	(%)
Total	30	(100.0)
Age (Years)		
<30	10	(33.3)
30 – 34	10	(33.3)
35 – 54	5	(16.7)
55+	5	(16.7)
Sex		
Female	13	(43.3)
Male	17	(56.7)
Race		
White	27	(90.0)
Other	3	(10.0)
Symptoms of Acute HCV		
Yes	30	(100.0)
No	0	(0.0)
Jaundice		
Yes	16	(53.3)
No	10	(33.3)
Unknown	4	(13.3)
Alanine Aminotransferase (ALT) Level		
≥400 IU/mL	29	(96.7)
<400 IU/mL	1	(3.3)
Injection Drug Use in 2 Weeks – 6 Months Before Symptom Onset		
Yes	9	(30.0)
No	7	(23.3)
Unknown	14	(46.7)
Lifetime Injection Drug use		
Yes	16	(53.3)
No	4	(13.3)
Unknown	10	(33.3)

Abbreviations: IU/mL: International Units per Milliliter.

- Most cases were male, aged <35 years, and white (Table 2)
- All had symptoms of acute HCV, 29 (96.7%) had an ALT level greater or equal to 400 IU/mL, and 16 (53.3%) were jaundiced
- Nine (30.0%) used injection drugs in the past two weeks and 16 (53.3%) used injection drugs in their lifetime
- All cases had an address on file and 25 (83.3%) had a phone number, facilitating patient contact for most
- <5 cases were identified in each county except Saline and Benton counties, which had 5 cases each

Conclusions

- Expansion of HCV surveillance resulted in identification of 30 confirmed acute HCV cases
- Acute HCV incidence rate in Arkansas (1 case per 100,000 persons) exceeded Healthy People 2020 goal of 0.25 new cases per 100,000 persons
- Eight cases (26.7%) would have been missed if all persons aged <30 years were not investigated
- Among 10 acute HCV cases aged <30 years, 2 (20.0%) were reported with symptoms or elevated liver enzymes while 8 had HCV lab results only
- If only 20% of acute cases are reported with signs or symptoms, we would expect at least 80 additional cases to be reported with lab results only and not investigated due to lack of accompanying signs or symptoms
- Findings will be used to inform HCV surveillance procedures and monitor proximity to national goals for HCV incidence

Limitations

- ADH was unable to investigate all reported cases beyond persons aged <30 years or persons reported with signs or symptoms of acute HCV
- There are likely acute HCV cases that were reported to surveillance but were not investigated
- Estimates of the acute HCV burden estimate are likely underestimated

References

[1]Immunization and Infectious Diseases: Objectives, IID-26. (2010). *Healthy People 2020.* Accessed from http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=23.
[2]Klevens RM, Liu S, Roberts H, Jiles RB, Holmberg SD. Estimating Acute Viral Hepatitis Infections from Nationally Reported Cases. (2014). *American Journal of Public Health,* 104(3): 482-7.

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