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Timing of Positive Hepatitis C Virus Test Results During and 1 Year Before Pregnancy

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Abstract

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Each author has confirmed compliance with the journal's requirements for authorship.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention. The Surveillance for Emerging Threats to Mothers and Babies Network does not collect information on sex or gender of the birthing individual. The terms "maternal" and "mother" are used throughout this publication to describe characteristics of people who are pregnant for clarity, but birthing individuals may be of any gender and may choose not to parent.

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The incidence of hepatitis C virus (HCV) infection in reproductive-aged adults quadrupled during the past decade. Hepatitis C can progress to advanced liver disease and be transmitted perinatally. Highly effective curative hepatitis C treatment is available but is not recommended in pregnancy. Using the Surveillance for Emerging Threats to Mothers and Babies Network, we describe timing of positive RNA testing among pregnant people with HCV (HCV RNA detected during or within one year prior to pregnancy). Four US jurisdictions reported 1161 pregnancies during 2018–2021 among people with hepatitis C: 75.9% were multiparous; and 21.4% had their first peri-pregnancy HCV RNA detected prior to pregnancy, indicating potential missed treatment opportunities to improve maternal health and prevent perinatal transmission.

INTRODUCTION

Hepatitis C virus (HCV) infection causes liver disease and can be transmitted perinatally during pregnancy and delivery. The incidence of acute HCV infection in younger adults has quadrupled over the past decade in the United States (from 0.7/100,000 in 2009 to 2.9/100,000 in 2019 for those aged 20–29 years).[1] Curative treatment with direct-acting antiviral medications is not recommended in pregnancy; diagnosis and treatment should occur before pregnancy to prevent perinatal transmission. We describe demographics, pregnancy characteristics, and timing of positive HCV RNA test results among pregnant people with HCV infection.

METHODS

The Surveillance for Emerging Threats to Mothers and Babies Network conducts linked longitudinal surveillance of pregnant people with diagnosed HCV infection and their infants.[2] As of June 2022, four jurisdictions (New York City; New York State; Allegheny County, Pennsylvania; and Tennessee) contributed data on pregnancies affected by HCV infection with live births occurring from January 1, 2018, to December 31, 2021. *Peripregnancy HCV infection* was defined as a positive HCV RNA test result either during pregnancy or in the 12 months before pregnancy without a subsequent negative test result or treatment. If more than one pregnancy met inclusion criteria, only the earliest was included. Ascertainment occurred through linkages of HCV electronic laboratory reports with birth certificates to identify pregnancy status. Substance use history was obtained through medical records (including urine drug screening) by three jurisdictions. Medical record abstractors were advised to use best available pregnancy dating.[3] Analyses were conducted using SAS 9.4. This public health surveillance activity was deemed non–human subjects research and was conducted consistent with applicable federal law and policy. IRB review was not required.

RESULTS

Four jurisdictions reported 1,161 pregnancies meeting inclusion criteria. Most pregnant people were multiparous (75.9%) and had public insurance (81.7%); 19.6% had late or no prenatal care (Table 1). Eighty percent were found to have any substance use in pregnancy, with 33.0% identified as having polysubstance use.

Twenty-one percent had first peripregnancy positive RNA test results before pregnancy, 27.2% during the first trimester, 28.0% during the second trimester, and 21.8% during the third trimester. Of those with HCV infection detected before pregnancy, 79.0% were multiparous (Table 1) and median time from first positive test result to last menstrual period was 207 days (interquartile range 100–306). Of those with a first positive test result in pregnancy and known date of first prenatal care visit (n=749), 23.2% had their first positive HCV RNA test result on the same day as the first prenatal care visit. Ten percent had a first positive test result within 3 days of giving birth.

DISCUSSION

One fifth of people with peripregnancy HCV infection had a positive HCV RNA test result before pregnancy. Most were multiparous, representing potential missed opportunities for treatment before the current pregnancy. Ideally, universal screening of adults aged 18–49 years[4] would lead to prompt referrals for treatment; however, recent data suggest low treatment rates, particularly among young adults.[5] Guidelines for screening for HCV infection in every pregnancy were published in 2020 and 2021.[6–8] Pregnancy provides a unique opportunity to diagnose HCV infection, especially for those who may not otherwise have insurance or engage in care, and allows for referral for treatment postpartum and adjustment of intrapartum management to reduce the risk of transmission.[6,9]

This analysis has several limitations. First, it is limited to pregnancies resulting in live birth and to individuals with HCV RNA detected in the year before pregnancy or during pregnancy, which omits people with a remote diagnosis. Second, 26% of the cohort had no, late, or were missing information on prenatal care, potentially resulting in unreliable pregnancy dating.[3] Third, ascertainment of substance use is challenging due to stigma, fear, and distrust[10] leading to underreporting.

This report highlights missed opportunities for curative treatment before pregnancy among people with HCV infection. Identification of HCV infection and prompt referral to care is essential for people of reproductive age, for their own health and to prevent perinatal transmission.

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Table 1.

Demographics and Clinical Characteristics by Timing of First Detection of Peripregnancy Hepatitis C Virus RNA, Four State and Local Health Departments,* Surveillance for Emerging Threats to Mothers and Babies Network, 2018–2021 (N=1,161)

		Timing of Detection of Peripregnancy HCV RNA†			
Characteristic	**Total [N=1,161 (100)]‡**	**Prepregnancy [n=248 (21.4)]**	**1st Trimester [n=316 (27.2)]**	**2nd Trimester [n=325 (28.0)]**	**3rd Trimester [n=253 (21.8)]**
Maternal age at 1st detection of HCV RNA (y)	29 (25–32)	28 (25–32)	28.5 (26–32)	29 (25–32)	29 (26–33)
24 or younger	207 (17.8)	53 (21.4)	51 (16.1)	64 (19.7)	36 (14.2)
25–29	455 (39.2)	94 (37.9)	135 (42.7)	124 (38.2)	92 (36.4)
30–34	331 (28.5)	67 (27.0)	90 (28.5)	90 (27.7)	79 (31.2)
35 or older	168 (14.5)	34 (13.7)	40 (12.7)	47 (14.5)	46 (18.2)
Missing	0	0	0	0	0
Insurance					
Public	920 (81.7)	186 (75.6)	258 (83.8)	269 (84.6)	200 (81.3)
Private	183 (16.3)	58 (23.6)	47 (15.3)	45 (14.2)	32 (13.0)
Other or none	23 (2.0)	2 (0.8)	3 (1.0)	4 (1.3)	14 (5.7)
Missing	35	2	8	7	7
Education level					
Less than high school	242 (22.8)	59 (24.4)	56 (19.3)	67 (22.6)	60 (26.6)
High school graduate	475 (44.7)	117 (48.4)	136 (46.9)	131 (44.1)	87 (38.5)
Some college	227 (21.4)	51 (21.1)	54 (18.6)	66 (22.2)	54 (23.9)
College degree or more	118 (11.1)	15 (6.2)	44 (15.2)	33 (11.1)	25 (11.1)
Missing	99	6	26	28	27
Trimester of prenatal care initiation					
1st	556 (52.2)	133 (56.1)	248 (83.8)	108 (36.2)	66 (28.7)
2nd	302 (28.3)	59 (24.9)	35 (11.8)	152 (51.0)	56 (24.4)
3rd	105 (9.9)	21 (8.9)	7 (2.4)	21 (7.1)	56 (24.4)
None	103 (9.7)	24 (10.1)	6 (2.0)	17 (5.7)	52 (22.6)
Missing	95	11	20	27	23
Parity					
Nulliparous	273 (24.1)	52 (21.1)	79 (25.2)	85 (26.7)	54 (21.9)

Characteristic	Total [N=1,161 (100)][‡]	Timing of Detection of Peripregnancy HCV RNA[†]			
		Prepregnancy [n=248 (21.4)]	1st Trimester [n=316 (27.2)]	2nd Trimester [n=325 (28.0)]	3rd Trimester [n=253 (21.8)]
Multiparous	861 (75.9)	195 (79.0)	235 (74.8)	234 (73.4)	193 (78.1)
Missing	27	1	2	6	6
Substance use during pregnancy[§]					
Any	804 (79.3)	146 (79.8)	215 (73.4)	249 (83.0)	191 (85.7)
Polysubstance	335 (33.0)	55 (16.4)	87 (26.0)	104 (31.0)	88 (26.3)
Alcohol	51 (5.2)	12 (6.6)	16 (5.5)	13 (4.4)	9 (4.1)
Tobacco	728 (73.6)	135 (73.8)	193 (66.8)	227 (77.2)	171 (77.7)
Cannabis	216 (21.8)	31 (16.9)	62 (21.5)	74 (25.2)	48 (21.8)
Prescription opioids	22 (2.2)	3 (1.6)	8 (2.8)	5 (1.7)	6 (2.7)
Illicit opioids	220 (22.2)	39 (21.3)	52 (18.0)	69 (23.5)	59 (26.8)
Other illicit substances	214 (21.6)	35 (19.1)	49 (17.0)	69 (23.5)	60 (27.3)
Medication for OUD[§]	263 (26.6)	43 (23.5)	79 (27.3)	83 (28.2)	56 (25.5)

HCV, hepatitis C virus; OUD, opioid use disorder.

Data are n (%) or median (interquartile range).

[*] Pennsylvania, New York City, New York State, Tennessee.

[†] Prepregnancy, 1 year before last menstrual period; first trimester, LMP to less than 14 weeks of gestation, second trimester, 14 weeks to less than 28 weeks; third trimester, 28 weeks or more. Three jurisdictions limited reporting to RNA testing at date of pregnancy outcome; one jurisdiction included RNA testing up to 14 days postpartum.

[‡] Seventy-seven subsequent pregnancies meeting inclusion criteria were excluded from this analysis. Nineteen people were tested during pregnancy, but trimester of test could not be determined.

[§] Among three jurisdictions (Allegheny County, Pennsylvania, New York State, and Tennessee) systematically collecting information on substance use or medication for opioid use disorder from medical records.