Role Of Physician Specialties To Close Gaps in the Care Cascade of Hepatitis C: Evidence From Paid Claims in the United States From 2010 To 2016

THU-112

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BACKGROUND

- The Centers for Disease Control and Prevention [CDC] estimate the prevalence of chronic hepatitis C virus (HCV) in the United States (US) to be 1.3% (1.2%–2.4%), equivalent to 2.7–3.9 million individuals,[1] but only 10–50 % are currently diagnosed.[2]
- It is recommended that all positive HCV antibody (AB) tests be followed by a HCV RNA blood test to determine the presence of active infection.
- National estimates indicate that only 27% of the population screened positive for HCV exposure has a confirmatory RNA test,[2] posing a significant gap in the cascade of care for hepatitis C.
- Limited referrals, linkage to care and access to treatment constitute other important gaps in the HCV care cascade.
- Despite the availability of novel oral direct-acting antiviral (DAA) regimens post 2013 that provide cure rates of up to 100% and improve patient reported outcomes,[3-9] a national study estimated only 16% of patients with HCV were prescribed treatment.[2]
- Prior studies on key gaps in the care cascade were either conducted during the pre – DAA era[9-11] or restricted to specific individual centers, geographies[9-13] or ethnic groups.[14]
- Furthermore, the role of physician specialties for closing key gaps in the HCV care cascade is poorly understood.

OBJECTIVES

- This study assesses AB screening rates, AB+ detection rates and linkage to care rates by physician specialty, and evaluates key determinants of HCV screening, detection, linkage to care and treatment in the US.

METHODS

Data source:

- Claims data from Optum Clinformatics® Data Mart, a de-identified database from the US, analysed over 2010–2016.

HCV AB Screening

- HCV screening was identified by paid claims for Current Procedural Terminology (CPT) codes 86803, 86804, or G0742.
- Screened patients having a diagnosis of HCV during the pre-index period were excluded from the analysis.
- Physician specialty for screening was based on the physician's order or bill for the index AB test.
- A cohort of unscreened patients was also analyzed using a randomly selected pool of patients without AB test.
- Index date was defined as the date of first observed AB test for the screened cohort and a randomly selected date for the unscreened cohort.
- All patients were required to be at least 20 years of age at index date and have at least 6 months of continuous enrollment pre-index.

HCV Diagnosis and Linkage to Care

- Screened patients who tested AB+ were identified and their access to treatment was assessed.
- The HCV diagnosis analysis focused on the subset of patients who received HCV AB screening and had non-missing lab data for the AB screening tests [LOINC codes (13955–0, 48159–8, 5198–7)] along with relevant test names.
- In addition to the earlier requirement of 6 months of pre-index data, patients in this analysis were further required to have minimum 6 months of continuous enrollment following the screening index date.
- Patients with missing or ambiguous test results were excluded from the analysis. The positive test results were identified if the numeric results were greater than 0.9[15] or had character results mentioned as positive.
- Linkage to care and access to treatment was defined by presence of drug prescription following confirmed diagnosis. NDC codes and drug names were used to identify presence of treatment during the post-index period.

Multivariate analysis:

- Logistic regression was used to estimate the effect of physician specialty and time trend on the likelihood of being linked to care and receiving treatment, controlling for patient characteristics.

RESULTS – Descriptive Statistics

- Baseline demographic characteristics are displayed in Table 1 and key comorbidities are displayed in Table 2.

HCV Screening

- The demographic characteristics of screened and unscreened individuals were similar with some notable exceptions.
- Screened patients were more likely to be female, consumed more health care per month prior to their screening date, had fewer doctor visits and a higher risk of extrahepatic manifestations (EHMs) related to HCV such as cardiovascular disease (CVD), type 2 diabetes mellitus (T2DM), nephritis and chronic kidney disease (CKD); hepatic comorbidities like cirrhosis and hepatic compensation; and coinfections like HIV and HBV.

HCV Diagnosis: AB+ Testing

- Compared to AB- patients, AB+ patients at baseline were more likely to be male and baby boomers, and have more doctor visits and greater health care costs.
- A higher proportion of AB+ patients were in F2 stage or higher and had EHMs related to HCV such as CVD, T2DM, nephritis and CKD; hepatic comorbidities like cirrhosis, and hepatic compensation; and coinfections like HIV and HBV.

Referral, Linkage to Care and Treatment

- Treated patients were more likely to be males and less likely to have EHMs related to HCV such as CVD, T2DM, nephritis and CKD, and coinfections like HIV and HBV.
- However, treated patients exhibited a higher proportion of hepatic related comorbidities like cirrhosis, hepatic compensation, suggesting prioritization of treatment to advanced liver disease stages.

Table 1. Patient Characteristic At Baseline

	Likelihood of Screening		Likelihood of AB + Test		Likelihood of HCV treatment	
	Screened	Not Screened	AB+	AB-	Treated	Not Treated
Sample Size [N]	1,056,583	1,243,581	12,578	507,490	2,399	5,853
Age [mean]	46.3	46.5	51.5	43.2	56.1	54.8
Baby boomer population[a]	34.7%	35.5%	55.5%	29.1%	74.9%	61.7%
Gender: Female[b]	61.9%	51.3%	48.0%	64.1%	38.7%	44.0%
Race						
Asian	6.6%	3.7%	4.9%	7.5%	2.9%	6.7%
Black	11.5%	7.3%	15.2%	12.6%	17.5%	16.2%
Hispanic	11.5%	9.5%	11.8%	13.4%	10.3%	12.8%
White	59.7%	58.8%	58.2%	56.6%	4.3%	3.8%
Unknown	5.0%	4.6%	4.5%	5.0%	62.3%	57.0%
Missing	5.8%	16.1%	5.6%	4.9%	2.7%	3.5%
Medical cost prior 6 mos.	$6,173.49	$4,674.87	$7,266.14	$4,272.89	$4,157.31	$8,114.14
Pharmacy cost prior 6 mos.	$2,768.99	$938.19	$5,068.31	$2,556.87	n.a.	n.a.
Visits per month	2.0	2.7	2.3	1.8	2.2	2.5
FIB-4 Data for Sub-Sample with Laboratory Data						
FIB 4 Sample Size	254,450		6,252	213,206	1,006	1,609
Mean FIB - 4 score	1.13		1.88	1.07	2.67	2.18
F0–F1	80.5%	–	57.1%	82.3%	37.1%	52.8%
F2	16.6%	–	31.3%	15.4%	40.6%	32.5%
F3–F4	2.9%	–	11.6%	2.3%	22.3%	14.7%

[a]Rest of the proportion represents non baby boomer population; [b]Rest of the proportion represents male population

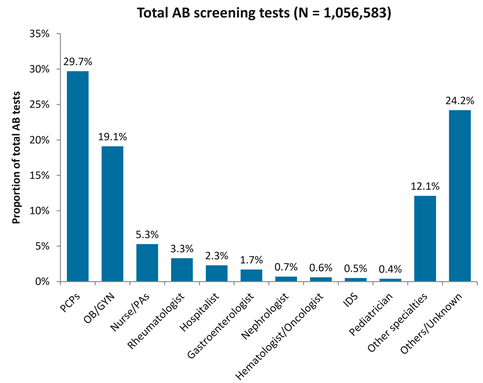
Table 2. Comorbidities at Baseline

	Likelihood of Screening		Likelihood of AB + Test		Likelihood of HCV treatment	
	Screened	Not Screened	AB+	AB-	Treated	Not Treated
Sample Size [N]	1,056,583	1,243,581	12,578	507,490	2,399	5,853
Comorbidities						
Cardiovascular disease	6.9%	4.0%	8.3%	5.1%	11.1%	14.7%
Type 2 diabetes mellitus	12.9%	5.5%	16.9%	10.3%	22.4%	26.1%
Nephritis, nephrotic syndrome, nephrosis	3.2%	1.0%	2.9%	1.7%	4.5%	9.8%
Chronic kidney disease	2.9%	0.7%	2.4%	1.6%	3.9%	7.8%
Inflammatory bowel disease	1.3%	0.8%	1.2%	1.4%	1.6%	1.8%
Fatigue	3.6%	1.2%	3.8%	3.4%	4.1%	4.6%
Fibromyalgia	4.7%	2.3%	4.8%	4.4%	5.4%	6.5%
Depression	6.6%	3.9%	8.5%	5.8%	11.8%	11.9%
Gastroesophageal reflux disease	8.4%	5.1%	9.8%	7.4%	17.7%	15.8%
Mixed Cryoglobulinemia	0.0%	0.0%	0.1%	0.0%	0.3%	0.1%
Cirrhosis	1.2%	0.3%	3.0%	0.8%	21.2%	13.3%
Hepatic compensation	1.5%	0.4%	3.8%	1.1%	23.8%	14.9%
Obesity	6.8%	3.6%	6.5%	6.4%	8.8%	8.5%
Coronary arterial disease	2.2%	1.2%	2.4%	1.4%	4.0%	4.7%
Cardiac arrest	0.1%	0.1%	0.1%	0.0%	0.0%	0.3%
HIV	5.5%	0.3%	7.3%	6.4%	7.9%	9.4%
HBV	0.7%	0.1%	1.2%	0.7%	4.4%	9.1%

RESULTS

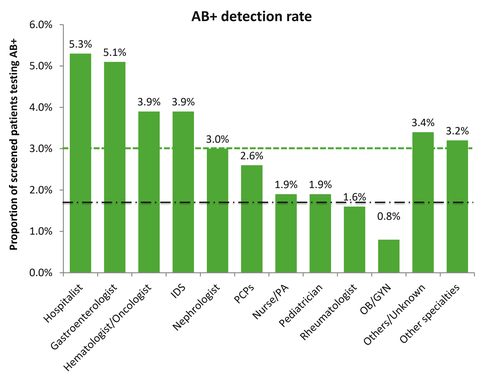
- Among the 1,056,583 total patients screened, most HCV AB tests were ordered by primary care physicians (PCPs; 29.7%), obstetricians/ gynaecologists (OB/GYNs; 19.1%) and nurses/physician assistants (PAs; 5.3%). (Figure 1)
- The mean AB+ detection rate across all studied specialties was 3% of screened patients, higher than the national AB+ prevalence of 1.7%.[16] (Figure 2)
- While gastroenterologists, oncologists, and infectious disease specialists did not account for more than 3% of total patients screened, their tests resulted in the highest observed AB+ detection rate (3.9%–5.3%).
- Linkage to care and treatment was low among AB+ patients at 13.8% overall, with hospitalist and gastroenterologists having the highest treatment rate of diagnosed patients (19.9%–25.0%). (Figure 3)
- Among the top three specialties ordering AB screening, OB/GYNs had the lowest rate of treated patients after AB+ diagnosis at 4.7%.

Figure 1: Proportion of Patients Screened By Physician Specialty



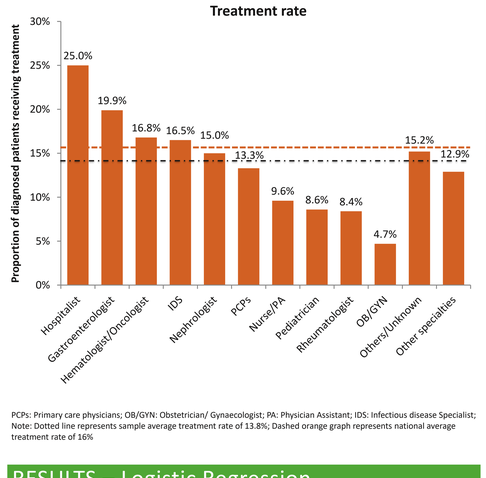
PCPs: Primary care physicians; OB/GYN: Obstetrician/ Gynaecologist; PA: Physician Assistant; IDS: Infectious Disease Specialist

Figure 2: Proportion of Patients Testing AB+ By Physician Administering AB Test



PCPs: Primary care physicians; OB/GYN: Obstetrician/ Gynaecologist; PA: Physician Assistant; IDS: Infectious disease Specialist; Note: Green dotted line represents sample average AB+ detection rate of 3%; Black dashed line represents national average of 1.7%[16]

Figure 3: Proportion of Patients Receiving Treatment By Index Screening Physician Specialty



PCPs: Primary care physicians; OB/GYN: Obstetrician/ Gynaecologist; PA: Physician Assistant; IDS: Infectious disease Specialist; Note: Dotted line represents sample average treatment rate of 13.8%; Dashed orange graph represents national average treatment rate of 16%

RESULTS – Logistic Regression

- Logistic regressions showed that being screened by gastroenterologists significantly increased the odds of treatment (odds ratio [OR]: 1.56) compared to PCP screening. (Table 3)
- On the other hand being screened by OB/GYN resulted in reduced odds of being treated (OR: 0.49) as compared to PCPs.
- Males (OR: 1.24) and baby boomers (OR: 2.23) were more likely to receive HCV treatment.
- The availability of novel DAAs in 2014 increased the treatment rate for AB+ patients (OR: 1.25).

Table 3: Logistic regression on likelihood of linkage to care and treatment among diagnosed HCV patients

Effect	Odds ratio	95% Wald Confidence Limits	
Age Categories (Ref: < 30)			
30 –45	1.314	1.004	1.719
45–65	2.237	1.761	2.841
>65	1.727	1.296	2.301
Physician specialty (Ref: Primary care Physician)			
OB/GYN	0.493	0.353	0.688
Nurse/PAs	0.805	0.604	1.074
Rheumatologist	0.593	0.383	0.918
Hospital	1.7	0.947	3.051
Gastroenterologist	1.567	1.251	1.964
Nephrologist	1.231	0.741	2.046
Infectious diseases specialist	1.184	0.784	1.79
Hematologist/oncologist	1.235	0.747	2.044
Pediatrician	0.777	0.305	1.984
Others/unknown	1.037	0.855	1.257
Other specialties	1.044	0.842	1.294
Time (Ref: 2010)			
2011–2013	1.102	0.884	1.375
≥2014	1.256	1.01	1.562
Gender (Ref: Female)			
Male	1.24	1.113	1.381
Comorbidities			
HIV	1.127	0.919	1.382
HBV	0.771	0.482	1.231

OB/GYN: Obstetrician and Gynaecologist; PA: Physician assistant

DISCUSSION

- Results from our study indicate, PCPs and OB/GYNs were more likely to administer an AB screening test, however they were less likely to prescribe hepatitis C treatment.
- This finding is consistent with prior studies indicating that only 28–32% of patients have been connected to specialty care.[17]
- Konerman et al. identifies PCPs as champions for attaining HCV eradication,[17] given that treatment upon diagnosis could close important gaps in referral and linkage to care.
- However, results from our study show that treatment rates among PCPs remain low.
- With the recent introduction of simplified pangenotypic and short-duration treatments, the ability to prescribe could be expanded to PCPs, and OB/GYNs to improve treatment upon diagnosis.

LIMITATIONS

- Inclusion criteria rely on accurate identification of labs, lab results, CPT and ICD-9 codes, which have well known limitations.
- It is possible that not every antibody lab was captured, and therefore there may have been some patients whose first documented positive AB test was prior to 2010. We attempted to minimize this possibility by excluding any patient who had a hepatitis C ICD-9 or detectable viral load documented prior to their first positive AB test.
- Lastly, this study used only data from single large commercial payer, and thus the results may not be generalizable to other health systems and/or populations.

CONCLUSIONS

- PCPs and OB/GYNs are the gatekeepers for HCV screening accounting for nearly half of total AB tests.
- In spite of high AB+ detection rates across specialties, treatment rates remain low
- Increased efforts are needed to improve linkage to care and treatment, especially in PCP and OB/GYN settings.

DISCLOSURES AND CONFLICTS OF INTEREST

Design and study conduct for the study was approved by AbbVie, Inc. AbbVie Inc. participated in the interpretation of data, and review and approval of the abstract. All authors contributed to the development of the publication and maintained control over the final content.

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Steven Marx and Yuri Sanchez Gonzalez are employees of AbbVie Inc. and may own stocks and/or options of the company.

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