Evaluation of access to care in patients prescribed sofosbuvir-containing regimens; data from the TRIO network

Zobair Younossi [1], Bruce Bacon [2], Douglas Dieterich [3], Steven Flamm [4], Kris Kowdley [5], Eric Lawitz [6], Scott Milligan [7] and Naoky Tsai [8]

[1] Center for Liver Diseases, Department of Medicine, Inova Fairfax Hospital, [2] Saint Louis University School of Medicine, [3] Icahn School of Medicine at Mount Sinai, [4] Northwestern University Feinberg School of Medicine, [5] Liver Care Network, Swedish Medical Center, Seattle, WA, [6] The Texas Liver Institute, University of Texas Health Science Center, San Antonio, TX, [7] Trio Health Analytics, [8] Queens Medical Center, University of Hawaii

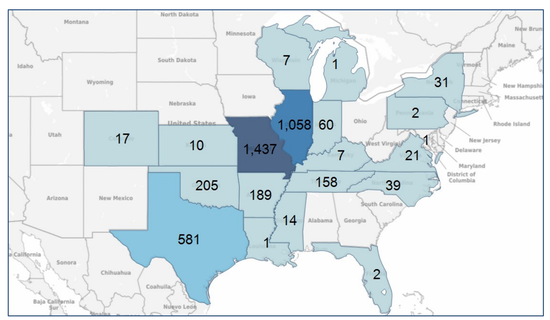
Trio Health

1. BACKGROUND AND AIM

Despite the clinical success in the real-world of HCV DAA therapy approaching that seen in the clinical trials, access has been limited. Though AASLD guidelines for sofosbuvir-containing treatment have suggested that F3 and F4 fibrosis patients be prioritized, certain payers have interpreted this guidance as a restriction to deny coverage of care for patients with less severe disease. To establish whether this or other barriers impact access to care, we evaluated real-world patients in the Trio Health (TRIO) network who did not start prescribed sofosbuvir-based regimens.

2. METHODS

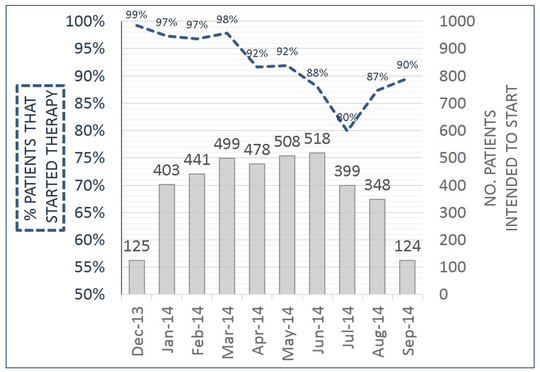
Trio Health is a disease management company that works in partnership with academic medical centers, community physicians and specialty pharmacies to optimize care for Hepatitis C. Data for 3,841 patients prescribed a sofosbuvir-containing regimen between Dec 2013 and Sep 2014 were obtained through the Trio Health program in partnership with a specialty pharmacy. Evaluation of these patients continued through Nov 2014, allowing a minimum of 60 days follow up to determine if initiation of therapy occurred. Approximately 80% of patients were treated by practices located in Missouri, Illinois or Texas with the remainder in 16 other states or DC.



Statistical calculations were performed in IBM SPSS 22. Categorical variables were compared via 2-sided asymptotic p-values generated from Pearson chi-square. Continuous variables were compared using 2-sample independent T-tests. Matched samples were created using 1-1 optimal propensity score matching without replacement. Propensity scores were generated from binary logistic regression using the dependent variable of primary insurance coverage and the covariates of age, sex, HCV genotype, initial viral load, fibrosis, prior treatment experience, and intended treatment of SOF + PEG + RBV, SOF + RBV, or SMV + SOF +/- RBV.

3. TREATMENT TRENDS

No. patients intended to start sofosbuvir-containing treatment and percentage that actually started by month



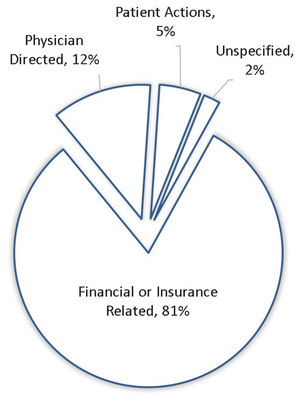
4. BASELINE CHARACTERISTICS

Patient Group - no. (%)	Started Therapy 3526 (92%)	Did Not Start 315 (8%)	Total 3841 (100%)
Age - mean (range)	56 (18-86)	52 (19-82)	56 (18-86)
Male - no. (%)	2027/3516 (58%)	169/313 (54%)	2196/3829 (57%)
Genotype - no. (%)			
1	326 (9%)	35 (11%)	361 (9%)
1a	1544 (44%)	153 (49%)	1697 (44%)
1b	565 (16%)	35 (11%)	600 (16%)
2	455 (13%)	33 (10%)	488 (13%)
3	321 (9%)	32 (10%)	353 (9%)
4-6	49 (1%)	7 (2%)	56 (1%)
Mixed or Unknown	266 (8%)	20 (6%)	286 (7%)
Fibrosis- no. (%)			
Not cirrhotic, score unknown	2054 (58%)	56 (18%)	2110 (55%)
Not cirrhotic, FS 0-2	543 (15%)	84 (27%)	627 (16%)
Not cirrhotic, FS 3	188 (5%)	25 (8%)	213 (6%)
Cirrhotic	741 (21%)	59 (19%)	800 (21%)
Score unknown	0 (0%)	91 (29%)	91 (2%)
Treatment Experienced - no. (%)	1630/3526 (46%)	107/294 (36%)	1737/3820 (45%)
Regimen Intended - no. (%)			
SOF + PEG + RBV	870 (25%)	37 (12%)	907 (24%)
SOF + RBV	1008 (29%)	72 (23%)	1080 (28%)
SMV + SOF +/- RBV	1639 (46%)	171 (54%)	1810 (47%)
Other#	9 (0%)	35 (11%)	44 (1%)
Payer Coverage - no. (%)			
Commercial	2218 (63%)	141 (45%)	2359 (61%)
Medicaid	258 (7%)	137 (43%)	395 (10%)
Medicare	664 (19%)	17 (5%)	681 (18%)
Government (e.g. VA, DOD)	20 (1%)	0 (0%)	20 (1%)
Patient Assistance, Self-Pay, without coverage or unspecified	366 (10%)	20 (6%)	386 (10%)

#Predominantly SOF monotherapy but also includes non-standard therapies such as PEG+SOF.

5. REASONS FOR NON-STARTS

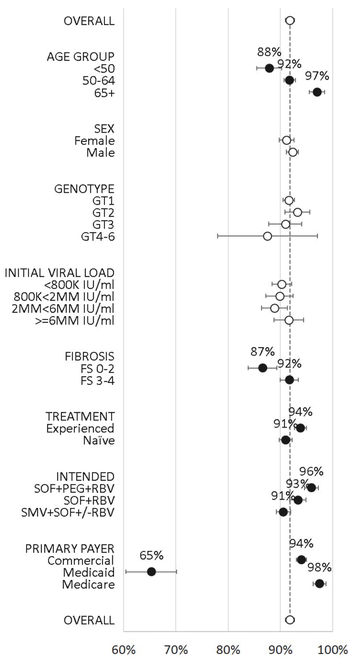
Distribution of patients by primary reason for non-start



Detailed Reasons for Non-Starts		n	%
Financial or Insurance Related	Financial reasons including insurance change	82	26%
	Insurance denial, reason unspecified	62	20%
	Insurance denial due to missing or failed drug tests	53	17%
	PA or appeal waiting on documentation from physician	25	8%
	In pre-authorization	19	6%
	Insurance denial due to missing or low fibrosis score	12	4%
	In appeal of insurance denial	1	0%
Physician Directed	Physician warehousing for Harvoni	27	9%
	Physician direction to hold treatment	12	4%
Patient Actions	Patient unreachable or non-compliant with testing	15	5%
Unspecified	Non-start reason unspecified	7	2%
Total		**315**	**100%**

6. START RATES

Overall and Subgroup Start Rates
p<=0.05 for filled circles, whiskers = 95% confidence intervals



7. MATCHED SUBGROUPS

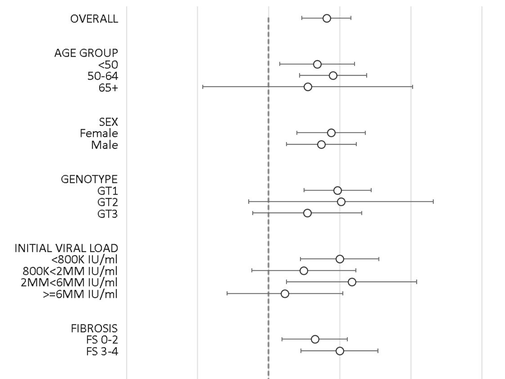
Baseline demographic and clinical characteristics of commercial (C) and Medicaid (M) subgroups before and after 1-1 optimal propensity score matching without replacement.

Characteristics	Before Matching C n=907	Before Matching M n=176	Before Matching p	After Matching C n=166	After Matching M n=166	After Matching p
Age Group						
<50	13%	28%	<0.001	27%	27%	0.992
50-64	64%	68%		69%	70%	
65+	23%	3%		4%	4%	
Sex						
Female	40%	52%	0.006	51%	51%	1.000
Male	60%	48%		49%	49%	
Genotype						
GT1	80%	70%	0.047 *	73%	73%	0.939 *
GT2	10%	15%		13%	14%	
GT3	9%	11%		10%	11%	
GT4-6	2%	3%		3%	2%	
Initial Viral Load						
<800K IU/ml	41%	40%	0.579	43%	42%	0.967
800K<2MM	21%	21%		17%	19%	
2MM<6MM	25%	22%		22%	23%	
>=6MM IU/ml	13%	17%		17%	16%	
Fibrosis						
FS 0-2	39%	42%	0.390	42%	42%	0.911
FS 3-4	61%	58%		58%	58%	
Treatment						
Experienced	48%	38%	0.013	42%	39%	0.575
Naïve	52%	63%		58%	61%	
Regimen Intended						
SOF+PEG+RBV	24%	32%	<0.001	34%	31%	0.630
SOF+RBV	24%	34%		29%	34%	
SMV+SOF+/-RBV	52%	34%		37%	36%	

*Calculated without GT4-6 due to insufficient sample

8. SUBGROUP ODDS RATIOS

Odds ratios for starting treatment in propensity score-matched Medicaid vs Commercial subgroups. Circles indicate odds ratios, whiskers = 95% CI.



9. SUMMARY

315/3841 (8%) patients prescribed a sofosbuvir-containing regimen between Dec 2013 and Sep 2014 did not start the intended therapy. In the non-start group, 171/315 patients (54%) were intended to receive SMV + SOF +/- RBV, 137/315 (43%) were primarily covered by Medicaid, and of those with known fibrosis scores, 84/168 (50%) had scores of 0-2.

Only 15/315 (5%) patients did not start because they were unreachable or failed to complete required testing. 39/315 (12%) patients were following their physicians' direction to hold treatment. Insurance-related processes and financial reasons accounted for 254 (81%) of the 315 non-starts.

The non-start rates varied by measure but were strikingly different by primary insurance coverage. The non-start rate was highest in the Medicaid population at 35% followed distantly by commercial (6%) and Medicare (2%) populations.

A comparison of propensity score matched Medicaid and commercial subgroups revealed that for each demographic, the commercial matched group was more likely to start therapy. The greatest disparity was observed with intended SMV + SOF +/- RBV, with an odds ratio of 15.4 in favor of commercial patients.

One or more of the authors have served as a consultant or scientific advisor for AbbVie, Achillion Pharmaceuticals, BioCryst, Biotica, Bristol-Myers Squibb, Enanta, Evidera, Gilead Sciences, Inc, Idenix Pharmaceuticals, Inc, Janssen Therapeutics, Merck & Co, Inc, Novartis, Regulus, Santaris Pharmaceuticals, Tekmira Pharmaceuticals, Theravance, Trio Health, Vertex Pharmaceuticals; received grant or research support from AbbVie, Beckman, Boehringer Ingelheim, Bristol-Myers Squibb, Gilead Sciences, Inc, Idenix Pharmaceuticals, Inc, Ikaria, Intercept, Janssen Therapeutics, Merck & Co, Inc, Novartis, Presidio, Roche, Santaris Pharmaceuticals, Theravance, Vertex Pharmaceuticals; and/or received speaker honoraria from AbbVie, Bayer, Bristol-Myers Squibb, Gilead Sciences, Inc, Janssen Therapeutics, Kadmon, Merck & Co, Inc, Roche, Salix, Vertex Pharmaceuticals.