A Retrospective analysis of costs and trends in the treatment of HCV in the setting of specialty pharmacy

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Introduction

- Hepatitis C Virus (HCV) is a bloodborne pathogen that is a leading cause of liver related complications, such as cirrhosis, hepatitis, and hepatocellular carcinoma[6].
- HCV can cause both chronic or severe acute infections and newly infects up to 100 million people globally every year, primarily through blood-to-blood contact such as IV drug use with shared needles[3].
- Today, patients are treated with direct acting antiviral medications based on Infectious Diseases Society of America (IDSA) guideline recommendations, stratified by the viral genotype (GT) of their specific strain of the virus[2] in addition to various clinical and demographic characteristics.
- The objective of this study is to determine if any of these characteristics put patients at a higher risk of failing in the treatment of their HCV.

End Points

- Primary Endpoint: Success Rates of HCV therapy as stratified by viral GT
- Secondary Endpoints: Average costs of pharmacotherapeutic treatment, incidence of comorbidities, patient demographics, fibrosis score as stratified by viral GT

Methods

- This study was completed through a retrospective cohort medical chart review of all patients being treated for HCV within the Avella Specialty Pharmacy network of pharmacies.
- Patient demographics, clinical information and physician data was collected and de-identified by pharmacy staff, and then delivered to the researchers for analysis.
- Patient information was gathered from patients being treated from January 1st, 2018 through December 31, 2018.
- Data collected included patient age, gender, viral GT and subtypes, Liver fibrosis score, any comorbidities, SVR Result, medication being used to treat HCV, and length of therapy in weeks.
- Patients were eligible for analysis if they had started HCV treatment in 2018 as determined by fill dates, were above the age of 18, and had a definitive sustained virologic response (SVR) result, being undetected or detected.
- Categorical data was analyzed through Chi-square and Fischer's Exact test, nominal data was analyzed through determination of the mean and standard deviation. These means were then further analyzed through a one-way ANOVA test to determine significance between categories. The alpha-priori value was 0.05.

Disclosures

The authors of this presentation have nothing to disclose

Results

GT n (%)	1A n= 336 (56)	1B n= 93 (15)	2 n= 94 (16)	3 n= 81 (13)	P-value
Mean Age, years (±SD)	59.1 (10.9)	63.8 (9.5)	59.7 (13.2)	54.0 (12.9)	**<0.001**
Gender: n (%)	Male - 201 (60) Female - 135 (40)	Male - 46 (49) Female - 47 (51)	Male - 49 (52) Female - 45 (48)	Male - 36 (44) Female - 45 (56)	**<0.05**
Treatment Naive Undetectable: n (%)	268 (80)	78 (84)	73 (67)	61 (63)	0.68
Treatment Experienced Undetectable: n (%)	48 (14)	11 (12)	10 (9)	10 (10)	0.81
Undetectable SVR: n (%)	329 (98)	92 (99)	92 (98)	74 (91)	**<0.05**
Detectable SVR: n (%)	7 (2)	1 (1)	2 (2)	7 (9)	
Average Total Cost of therapy, $ (± SD):	$73,759.22 ($34,744.52)	$77,856.41 ($36,213.95)	$74,578.64 ($32,058.08)	$71,976.20 ($31,098.60)	0.69
Fibrosis Score F0: n (%)	47 (15)	7 (10)	16 (20)	14 (19)	
F1: n (%)	69 (22)	13 (18)	17 (21)	11 (14)	
F2: n (%)	58 (19)	10 (14)	21 (26)	9 (12)	0.15
F3: n (%)	45 (14)	15 (20)	8 (10)	14 (19)	
F4: n (%)	93 (30)	28 (38)	19 (23)	26 (35)	
Comorbidities HIV Coinfection: n (%)	7 (2)	1 (1)	0 (0)	0 (0)	0.48
HBV Coinfection: n (%)	14 (4)	1 (1)	2 (2)	4 (5)	0.51
PPI Use: n (%)	63 (19)	21 (23)	13 (14)	17 (21)	0.51
History of Illicit Drug us:e n (%)	94 (28)	17 (18)	17 (18)	20 (25)	0.12
Current Illicit Drug use: n (%)	16 (5)	3 (3)	3 (3)	5 (6)	0.48
History of Alcohol use: n (%)	48 (14)	7 (8)	12 (13)	15 (19)	0.19
Current Alcohol use: n (%)	53 (16)	7 (8)	10 (11)	6 (7)	0.055
Comorbid Anxiety: n (%)	23 (7)	7 (8)	6 (6)	6 (7)	0.96
Comorbid Chronic Kidney Disease: n (%)	12 (4)	6 (6)	6 (6)	2 (2)	0.37
Comorbid Depression: n (%)	74 (22)	23 (25)	17 (18)	22 (27)	0.50
Comorbid Diabetes: n (%)	50 (15)	20 (22)	11 (12)	9 (11)	0.18
Comorbid Hepatocellular carcinoma: n (%)	4 (1)	0 (0)	0 (0)	1 (1)	0.63
Comorbid Hyperlipidemia: n (%)	51 (15)	16 (17)	13 (14)	4 (5)	0.08
Comorbid Hypertension: n (%)	126 (38)	37 (40)	29 (31)	18 (22)	**<0.05**

Discussion

- Though still relatively very successful, Viral GT 3 had a significantly lower incidence of therapy success at 91%, which is in line with current literature and clinical experience. GT 1a, 1b and 2 had similar success rates at around 99[8].
- Additionally, patient age, gender ratios, and the presence of comorbid hypertension were all statistically different between groups.
  - GT 3 was the youngest group on average, GT 3 skewed female while GT 1a skewed male, and GT 1a had a higher incidence of comorbid hypertension compared to the other groups.
- Despite different therapies and lengths of treatment as recommended per IDSA guidelines, all groups had similar overall costs associated with their treatment.
  - Depending on their viral GT, patients were treated with 4-24 weeks of Epclusa, Harvoni, Mavyret, Viekira XR, Vosevi or Zepatier.
- Even in the presence of many comorbidities, liver cirrhosis, and even more 'difficult to treat' genotypes, current direct acting antiviral therapy is extremely effective, across all demographics and disease progression stages.
- The major takeaway of this study is that there was no clear explanation for why there is a difference in the incidence of achieving an unattainable SVR between patients of differing viral GT.
- Patients infected with a GT 3 strain of HCV will have a higher chance of therapy failure, potentially due only to it being that strain of the virus
- No clear relationship found between incidence of therapy failure and presence of comorbidities or cost of therapy

Limitations

- This study was limited only in analyzing viral GT groups 1a, 1b, 2 and 3 due to population size. Patients were seen in GT groups 4, 5 and 6, but not enough to perform further analysis with.
- To determine SVR, we were limited to physician or patient reported information on final outcomes, rather than examining lab values ourselves, further limiting the population with which to do analysis.
- Further research could focus on the smaller and more rare GT groups that could not be analyzed in this study, to see if similar trends exist in this population.

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