The Impact of Hepatitis-C Viral (HCV) Treatment on Work Absence and Productivity

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ABSTRACT

Introduction:

It has been reported that work productivity in HCV treatment is affected by virologic response and non-response to treatment in clinical trials with restricted patient inclusion and exclusion criteria[1]. However, there is limited information about the impact of treatment in real world populations. This study was designed to determine if HCV treatment associated with work loss and productivity in an employee database.

Methods:

Employee's records, from multiple large employers in the United States including demographic, payroll, health care, disability, absence, and workers' compensation information in the Human Capital Management Services Research Reference Database during the period of January 1, 2001 to June 30, 2007, were used in this study. The database is consistent with US employed Civilian Labor Force in terms of age and gender proportions. HCV subjects were identified by ICD9 codes (070.41, 070.44, 070.51, 070.54, or 070.7x). HCV treatment was defined by use of ribavirin, interferon or peginterferon. T-tests and chi-square tests were used to determine if there is a difference in demographic characteristics. Regression modeling was used to compare absence days and productivity, while controlling for the impacts of confounding factors.

Results:

A total of 1,494 subjects ($N_{Treated}$ =408 and $N_{non\text{-}Treated}$ =1,086) were evaluated. Mean observation times were 16.7 and 19.9 months for HCV treated and non-treated subjects, respectively. Employees with HCV Treatment showed significantly more sick leave (4.00 versus 2.40, P<0.0001) and higher long-term disability (5.62 versus 2.30, P=0.173) than the non-treated group. Also short-term disability was higher in treated (5.57 annual work loss days per employee) than non-treated (3.73) HCV group (P=0.0758). However workers' compensation (annual absence days per employee), was lower with 0.05 days in HCV treated, and 0.56 days in non-treated HCV subjects (p<0.0001). Productivity (units of work processed per hour) results were only available for a subset of employees ($N_{Treated}$ =31; $N_{non\text{-}Treated}$ =62). HCV treated employees processed 13.3% fewer units per hour than non-treated HCV employees (P=0.2001). The HCV treated workers also had 6.24 more total annual absence days per employee than the non-treated HCV workers.

Conclusion:

This study suggests that employees receiving HCV treatment had increased work-loss and reduced productivity during therapy. While severity of disease can not be determined in this population, reduced productivity and increased sick leave may be related to the negative impact of current treatment regimens.

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INTRODUCTION

- The hepatitis C virus (HCV) is a major cause of chronic liver disease in the United States and worldwide [2].
- HCV infected patients have been reported to experience a lower health-related quality of life (HRQoL) compared to the general population.
- Reduced HRQoL could impact patient's work absence and productivity
- The goal of the study was to assess the impact of HCV treatment on absenteeism and worker productivity using objectively captured data on an employed population.

METHODS

- Source data: Human Capital Management Services Research Reference Database (HCMS RRDb)
- HCMS RRDb contains adjudicated health insurance and prescription drug claims, with demographics and payroll information from more than 670,000 employees over the period from 2001 to 2008
- HCMS RRDb is representative of the 2004 US Employed Civilian Labor Force (139.2 million) in terms of age and gender

Study population

- All employees diagnosed with HCV with International Classification of Diseases, Ninth Revision (ICD-9) codes (070.41, 070.44, 070.51, 070.54, or 070.7x.) during the 1/1/2001 to 3/31/2007 time period.

METHODS (Continued)

Study population (Continued)

- **HCV Employees with Treatment** – Persons with HCV treatment claims for peg-interferon and/or ribavirin for at least six months from the start of therapy
- **HCV Employees without Treatment** – Persons with HCV non-treated with peg-interferon or ribavirin.
- Subjects were required to be over 18 years old on their index date.
- For employees with HCV treatment, the index date is the date of the first prescription for ribavirin, interferon or peginterferon in the study period.
- For employees with HCV and without treatment, the index date is the average index date (by company) of employees with HCV and treatment.
- Subjects were limited to those patients with claims for each benefit type

Outcomes measure

- Absence (Lost time), due to Sick Leave, Short-term Disability, Long-term Disability, and Workers' Compensation
- Indirect costs as measured by payments made to employees for leaves due to Sick Leave, Short-term Disability, Long-term Disability, and Workers' Compensation
- Productivity, units of work processed per hour using validated, proprietary units (The number of units produced divided by the number of hours worked).

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METHODS (Continued)

Statistical analysis

- *T*-tests and Chi-square tests were used to determine differences in demographic characteristics
- Regression modeling was used to compare absence days and productivity while controlling for the impacts of confounding factors. Only subjects with data for each element were included in the models for that benefit type.
- Statistical difference were considered significant when P≤0.05

RESULTS

- Mean observation times were 16.7 and 19.9 months for HCV treated and non-treated, respectively
- There were no statistical differences between patients with and without treatment except in ethnicity and marital status (Tables 1 and 2)

Table 1. Descriptive Statistics and Comparisons between cohorts

	HCV Employees with Treatment		HCV Employees without Treatment		Δ between Cohorts	
	N	Mean [S.E.] or Percent (%)	N	Mean [S.E.] or Percent (%)	Δ	*P*-Value
Age[1]	441	46.25 [0.31]	1,223	45.54 [0.22]	0.71	0.0638
Tenure [1]	441	10.54 [0.39]	1,223	9.90 [0.23]	0.64	0.1571
Annual Salary	441	$48,176 [$1,118]	1,219	$50,237 [$761]	-$2,061	0.1279
Female	441	35.4%	1,223	38.2%	-2.8%	0.2958
Married	409	57.7%	1,145	50.2%	7.5%	**0.0093**
White	336	64.6%	943	52.9%	11.7%	**0.0002**
Black	336	14.6%	943	12.7%	1.9%	0.3878
Hispanic	336	10.7%	943	8.8%	1.9%	0.3001
Full Time	441	93.4%	1,223	93.3%	0.1%	0.9259

[1] At Index date
Abbreviations: S.E.=Standard Error, **Δ** =Difference between cohorts

- Majority of HCV patients for this study were diagnosed with chronic HCV without mention of hepatic coma

Figure 1. Cohort inclusion Criteria by ICD-9

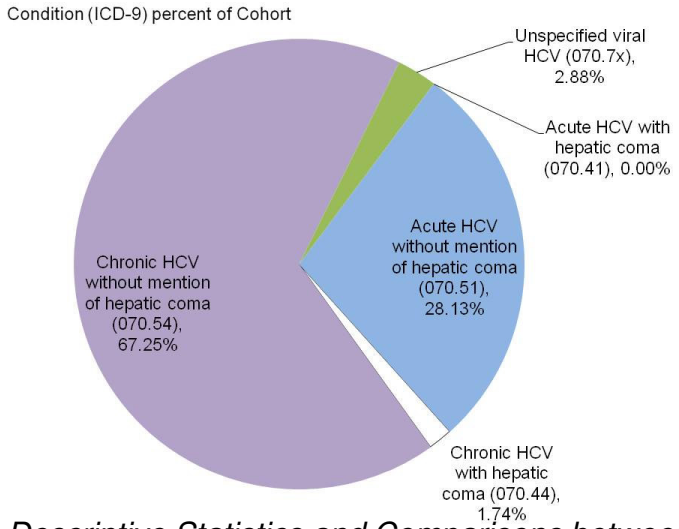

Table 2. Descriptive Statistics and Comparisons between cohorts for Employees with Productivity Data (A subset of Employees)

	HCV Employees with Treatment (N=31)	HCV Employees without Treatment (N=63)	Δ between Cohorts	
	Mean [S.E.] or Percent (%)	Mean [S.E.] or Percent (%)	Δ	*P*-Value
Age[1]	44.00 [1.03]	46.21 [0.73]	-2.21	0.0854
Tenure [1]	10.39 [1.09]	11.51 [0.81]	-1.12	0.4213
Annual Salary	$34,946 [$720]	$34,482 [$539]	$464	0.6152
Female	19.4%	14.3%	5.1%	0.5281
Married	67.7%	66.7%	1.1%	0.9170
White	80.6%	71.4%	9.2%	0.3353
Black	9.7%	11.1%	-1.4%	0.8322
Hispanic	6.5%	14.3%	-7.8%	0.2666
Full Time	12.9%	14.3%	-1.4%	0.8552

[1] At Index date
Abbreviations: S.E.=Standard Error, **Δ** =Difference between cohorts

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RESULTS (Continued)

- HCV employees with treatment showed significantly more sick leave and long-term disability days than the HCV Employees without Treatment (Figure 2)
  - The HCV treated workers had 6.24 more total annual absence days per employee than the non-treated HCV workers.
- Employees with HCV Treatment had significantly more annual absence costs in sick leave and long-term disability than the non-Treated group (Table 3)
- HCV employees with treatment processed 13.3% fewer units per hour than HCV employees without treatment (Figure 3).

Figure 2. Annual Absence Days per Employee between HCV Treated and non-Treated

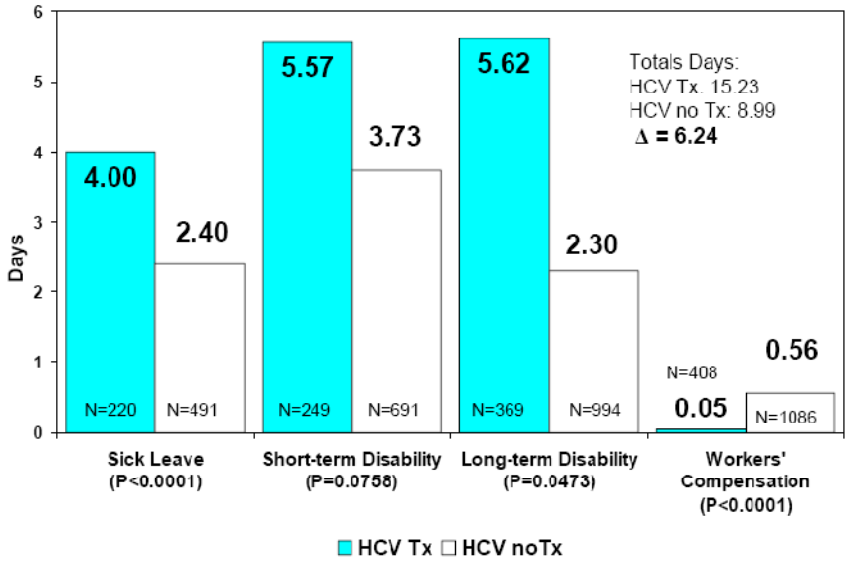

Figure 3. Hourly At-Work Productivity per Employee between HCV Employees with and without Treatment

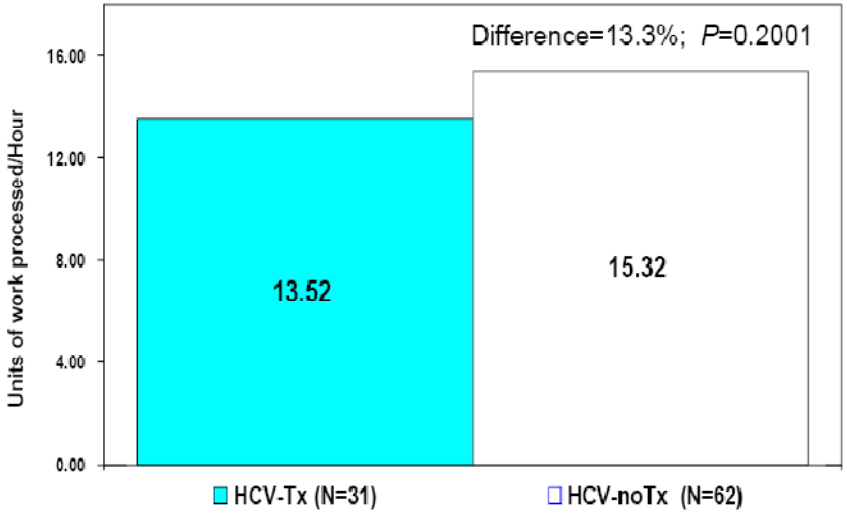

Table 3. Annual Absence Costs for HCV Employees with and without Treatment

	HCV Employees with Treatment		HCV Employees without Treatment		Δ between Cohorts	
	N	Adjusted Mean Cost	N	Adjusted Mean Cost	Δ	*P*-Value
Sick Leave	220	$642.36	491	$411.84	$230.52	**<0.0001**
Short-term Disability	249	$661.92	691	$399.96	$261.96	**0.0309**
Long-term Disability	369	$143.76	994	$166.56	($22.80)	0.7200
Workers' Compensation	408	$268.08	1,086	$362.04	($93.96)	0.1437
Totals Absence Costs		$1,716.12		$1,340.40	$375.72	

Abbreviations: **Δ** =Difference between cohorts

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SUMMARY AND CONCLUSIONS

- Current HCV anti-viral therapy results in following effects during the treatment:
  - Significant increases in annual absence days and costs
  - Reduction in productivity
- Treatments that minimize adverse events and have improved tolerability may lead to employer benefits in productivity and absenteeism for patients with chronic HCV

REFERENCES

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