Trends in Mortality and Health Care Burden of Cirrhotic Decompensation in Hospitalized Patients: A Nationwide Analysis

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Background

Mortality caused by cirrhosis is now the 14th most common cause of death worldwide and 12th most common in the United States. We studied trends in inpatient mortality and hospitalization costs associated with cirrhotic decompensation from esophageal variceal hemorrhage, ascites, hepatic encephalopathy (HE), spontaneous bacterial peritonitis (SBP) and hepatorenal syndrome (HRS) from 2007 to 2014.

Methods

Using the National Inpatient Sample databases, we first isolated patients 18 years or older with the diagnosis of cirrhosis using ICD-9 codes. We then identified patients with the admission diagnosis of esophageal variceal hemorrhage, ascites, HE, SBP and HRS. Time series regression was used to determine if a trend occurred over the study period.

Results

A total of 80,357 cirrhotic patients with the studied decompensations were captured. During the study period, time series regression confirmed downtrends in mortality rates for decompensations from HRS and hepatic encephalopathy. No trend was noted in mortality rates for decompensations from SBP, ascites, and variceal bleeding. Length of stay decreased for decompensations from SBP, HE, and variceal bleeding. No trend was noted for decompensations from HRS and ascites. Time series confirmed increases in hospitalization costs for all decompensations except for hepatorenal syndrome.

Hepatorenal syndrome						
	Mortality No / %			Mean Length of stay (days)		Average Total Charge (Dollars)	
2007	199	37.19		8.49		50,841	
2008	202	35.15		8.39		62,579	
2009	317	26.18		8.47		69,189	
2010	378	26.19	p=0.001	8.52	p=0.931	60,725	p=0.106
2011	407	28.01		8.35		77,346	
2012	409	28.85		9.01		73,177	
2013	410	25.61		8.3		70,440	
2014	463	21.38		7.94		73,873	
Mean overall		28.57		8.43		67271.25	

Spontaneous Bacterial Peritonitis						
	Mortality No / %			Mean Length of stay (days)		Average Total Charge (Dollars)	
2007	672	6.4		7.11		39,770	
2008	804	7.09		6.28		38,737	
2009	915	5.25		6.46		42,846	
2010	956	5.96	p=0.083	6.61	p = <0.001	42,799	p = <0.001
2011	1107	5.24		6.37		45,025	
2012	1011	5.34		6.64		47,331	
2013	1102	4.45		6.18		46,823	
2014	1066	4.22		5.85		46,733	
Mean overall		5.49		6.44		43758.00	

Hepatic Encephalopathy						
	Mortality No / %			Mean Length of stay (days)		Average Total Charge (Dollars)	
2007	7481	0.6		5.49		29,362	
2008	6689	0.6		5.32		28,909	
2009	6685	0.65		5.43		32,781	
2010	7499	0.54	p = <0.001	5.29	p = <0.001	33,853	p = <0.001
2011	7995	0.48		5.13		35,532	
2012	8175	0.49		5.07		35,175	
2013	8618	0.44		4.95		36,355	
2014	8578	0.43		5.09		38,044	
Mean overall		0.53		5.22		33751.38	

Ascites						
	Mortality No / %			Mean Length of stay (days)		Average Total Charge (Dollars)	
2007	448	0.07		3.33		16,958	
2008	638	0.06		3.42		16,949	
2009	605	0.1		3.75		20,859	
2010	739	0.11	p = .922	3.57	p=0.290	21,144	p = <0.001
2011	761	0.13		3.72		25,559	
2012	715	0.11		3.49		23,941	
2013	755	0.12		3.66		25,853	
2014	754	0.12		3.73		30,214	
Mean overall		0.10		3.58		22684.63	

Variceal bleeding						
	Mortality No / %			Mean Length of stay (days)		Average Total Charge (Dollars)	
2007	330	6.06		5.44		37,024	
2008	370	4.86		5.04		40,926	
2009	358	5.03		4.61		37,735	
2010	455	5.05	p=0.616	4.63	p =0.017	40,697	p = <0.001
2011	441	5.9		4.66		48,517	
2012	450	4		4.76		48,174	
2013	452	7.08		4.47		45,346	
2014	506	4.94		4.87		53,308	
Mean overall		5.37		4.81		43965.88	

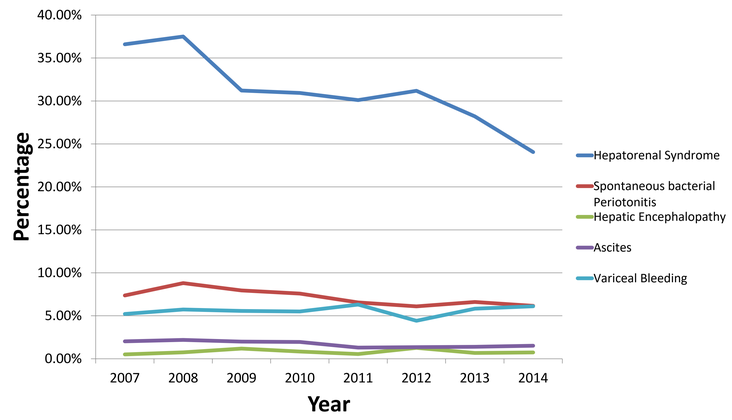

Figure 1. Mortality Rates over time (by hepatic decompensation type)

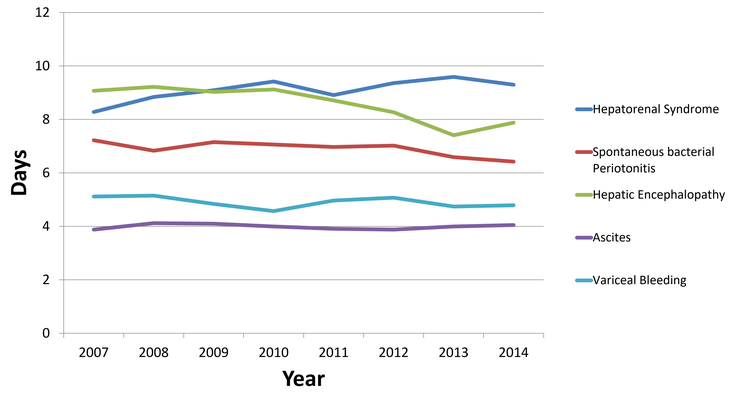

Figure 2. Mean Length of Stay over time (by hepatic decompensation type)

Conclusion

From 2007-2014, inpatient mortality rates decreased for cirrhotic decompensations secondary to HRS and hepatic encephalopathy. However, no difference was seen for decompensations from SBP, ascites, and variceal bleeding. Length of stay decreased for decompensations from SBP, HE and Variceal Bleeding while it remained unchanged for ascites and HRS. Hospitalization costs increased across the board except for hepatorenal syndrome.

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