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ALCOHOLIC VERSUS NONALCOHOLIC CIRRHOSIS IN A RANDOMIZED CONTROLLED TRIAL OF EMERGENCY THERAPY OF BLEEDING VARICES

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Abstract

Background—It has been proposed that portal-systemic shunts be avoided in alcoholic cirrhotics because survival rate is allegedly lower in alcoholics than in nonalcoholics. We examined this issue in a randomized controlled trial.

Methods—211 unselected, consecutive patients with cirrhosis and bleeding esophageal varices were randomized to endoscopic sclerotherapy (EST) (n=106) or emergency portacaval shunt (EPCS) (105). Treatment was initiated within 8 hours. EST failure was treated by rescue PCS. 10-yr follow-up was 96%.

Results—Results strongly favored EPCS over EST ($p<0.001$). Among EPCS patients, 83% were alcoholic and 17% nonalcoholic. Outcomes were (1) permanent control of bleeding 100% vs. 100%; (2) 5-yr survival 71% vs. 78%; (3) encephalopathy 14% vs. 19%; (4) yearly charges \$38,300 vs. \$43,000.

Conclusions—EPCS results were similar in alcoholic and nonalcoholic cirrhotics. EPCS is an effective first line emergency treatment in all forms of cirrhosis, including alcoholic.

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CONFLICT OF INTEREST

There was no conflict of interest relevant to this article on the part of any of the authors and no financial interests, relationships, or affiliations.

AUTHOR CONTRIBUTIONS

Study conception and design: Isenberg, M. Orloff, Wheeler
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Keywords

Cirrhosis; Bleeding esophageal varices; Emergency portacaval shunt; Endoscopic sclerotherapy; Alcoholic; Nonalcoholic

Alcoholic cirrhosis is by far the most common cause of bleeding esophageal varices (BEV) in the Western world [1–9]. By and large, use of portal-systemic shunts today has been relegated to elective rescue treatment for BEV only or mainly after endoscopic and pharmacologic therapies have failed to permanently control bleeding. Nevertheless, when portal-systemic shunts have been used for failed non-surgical therapy, it has been proposed that such procedures be avoided in alcoholic cirrhotics because, according to retrospective, unrandomized observations of elective treatment of BEV, survival rate was significantly lower in alcoholic than in nonalcoholic cirrhotics, especially with respect to the distal splenorenal shunt [9–14]. We examined this important issue in a randomized controlled trial (RCT) in 211 unselected, consecutive patients with cirrhosis and acute BEV in whom emergency and long-term repetitive endoscopic sclerotherapy (EST) was compared to emergency direct portacaval shunt (EPCS), otherwise known as total shunt. The trial was conducted from April 18, 1988 to December 31, 2005 and was a community-wide endeavor known as the San Diego Bleeding Esophageal Varices Study. In two recent publications, we described the study in detail and reported the outcomes first with regard to control of bleeding and survival [15], and second with regard to development of portal-systemic encephalopathy (PSE) [16]. This report focuses on the influence of the etiology of cirrhosis, particularly alcoholism, on outcome, following EPCS.

PATIENTS AND METHODS

Design of Study

Our two recent publications [15,16] described our RCT and provided full information on the protocols and methods. These include (1) design of study; (2) patient eligibility; (3) definitions of a) bleeding esophageal varices (BEV), b) unselected patients (“all comers”), c) emergency endoscopic sclerotherapy (EST), d) long-term endoscopic sclerotherapy (EST), e) emergency portacaval shunt (EPCS), f) failure of emergency primary therapy, g) failure of long-term therapy, h) rescue therapy, i) informed consent; (4) randomization; (5) diagnostic work-up; (6) quantitative Child’s classification; (7) initial emergency therapy during workup; (8) endoscopic sclerotherapy; (9) emergency portacaval shunt; (10) post-treatment therapy; (11) lifelong follow-up; (12) quantitation of portal-systemic encephalopathy (PSE); (13) data collection. The design of our RCT required documentation of the presence or absence of alcoholism on admission and at every follow-up visit monthly for the first post-entry year and every three months thereafter for 10 years or until death.

The study protocol and consent forms were approved before the start of the study and at regular intervals thereafter by the UCSD Human Subjects Committee (Institutional Review Board). Figure 1 is a Consort Flow Diagram that shows the overall design and conduct of the RCT [17,18].

Statistical Analysis

The comparison between alcoholic and nonalcoholic cirrhosis groups used Fisher’s exact test for dichotomous outcomes and Wilcoxon rank-sum test (WRT) for continuous outcomes. Survival comparisons used Gehan-WRT. The change in Child’s class was compared using the exact WRT, adjusted for ties. The average change in Child’s class during the first 5 years was computed based on the time spent in each category (improved,

unchanged, or worse) by patients at risk. A potential limitation of the study in which there were 18 nonalcoholic patients and 87 alcoholics was the relatively small sample size of the nonalcoholic group. The power to detect large effect sizes was 80%, with Cohen's $d=0.74$ or larger.

RESULTS

EPCS Versus EST - Outcome Data

Our recent publications described the clinical characteristics of the 211 patients, findings on upper endoscopy and liver biopsy, results of laboratory blood tests, data on rapidity of therapy, data on control of bleeding, operative and endoscopic data, data on PSE, and data on survival [15,16]. The two groups were similar in every aspect of cirrhosis and BEV. Histological proof of cirrhosis was ultimately obtained in all patients. Mean and median times from onset of bleeding to entry in the San Diego BEV Study were less than 20 hr in both groups of patients, and from onset of bleeding to start of EST and EPCS were less than 24 hr. EST achieved permanent long-term control of bleeding in only 20% of patients. In contrast, EPCS promptly and permanently controlled bleeding in every patient. Patients in the EST group required significantly more units of PRBC than those in the EPCS group because of continued or recurrent BEV.

15-yr Kaplan-Meier estimated survival plots for the EST and EPCS groups are shown in our previous publications [15,16]. There were highly significant differences in the survival rates of the two study groups at all time intervals ($p<0.001$). Survival rates were significantly higher after EPCS than after EST. Moreover, EPCS resulted in substantial long-term survival of patients in Child's risk class C who had the most advanced cirrhosis of the liver.

The incidence of recurrent PSE following EST was 35%, which was more than twice the 15% incidence following EPCS ($p<0.001$). EST patients had a total of 179 episodes of PSE and 146 PSE-related hospital admissions, compared with EPCS patients who had 94 episodes of PSE and 87 hospital admissions ($p=0.003$). Recurrent UGI bleeding, which was rare in the EPCS group, was a major causative factor of PSE in the EST patients.

Alcoholic Versus Nonalcoholic Cirrhosis

Etiology of Cirrhosis—87 of the 105 patients randomized to EPCS were classified as having alcoholic cirrhosis alone or with hepatitis. This diagnosis was based on a documented history of chronic alcoholism up to and including entry in the RCT, and liver biopsy findings compatible with alcoholic cirrhosis. The remaining 18 patients were classified as having nonalcoholic cirrhosis caused by hepatitis C or B in 10, primary biliary cirrhosis in 1, schistosomiasis in 1, and autoimmune hepatitis in 1. The etiology of cirrhosis was unknown in 5 patients but was clearly not caused by alcoholism.

Control of Bleeding—Table 1 provides data on control of bleeding and requirement for blood transfusions. Permanent control of variceal bleeding was obtained in all patients who underwent EPCS. Therefore, there was no difference in this regard between patients with alcoholic cirrhosis and those with nonalcoholic cirrhosis. Mean requirement for PRBC transfusions due to BEV was 13.37 units in alcoholic cirrhotics compared to 14.50 units in nonalcoholic cirrhotics. However, there was no significant difference between patients with alcoholic cirrhosis and those with nonalcoholic cirrhosis in total requirement for PRBC units for treatment of blood loss caused by all forms of bleeding, variceal and non-variceal.

Survival—Table 1 shows data on survival in patients randomized to EPCS. There were no statistically significant differences in survival for up to 10 years between patients with

alcoholic cirrhosis and those with nonalcoholic cirrhosis ($p=0.90$). Median survival was 6.03 years in alcoholics and 6.24 years in nonalcoholics ($p=0.90$). As expected, the survival rate was related to the severity of hepatic disease at the time of entry in the study. Comparing alcoholic cirrhosis to nonalcoholic cirrhosis in each Child's risk class, 5 year survival was 86% versus 92%, respectively, in class A ($p=0.90$), 76% versus 75%, respectively, in class B ($p=0.90$), and 67% in class C patients with alcoholic cirrhosis, there being only 2 class C patients with nonalcoholic cirrhosis for comparison.

Portal-systemic Encephalopathy—Table 2 provides data on recurrent PSE in patients randomized to EPCS. There was no statistically significant difference in the incidence of PSE between patients with alcoholic cirrhosis (14%) and those with nonalcoholic cirrhosis (19%) ($p=0.70$). Years of survival of patients who remained free of PSE were essentially the same in the two groups of cirrhotic patients (median survival 10.37 years versus 10.34 years) ($p=1.0$). The frequency of a high PSE index of 0.33 or greater was essentially the same in alcoholics (14%) and nonalcoholics (13%) ($p=1.0$).

Liver Function—Improvement or worsening of liver function following EPCS was determined by serial quantitative measurements of Child's risk class over the length of the clinical trial. Table 3 shows data that compares alcoholic versus nonalcoholic cirrhosis with regard to changes in quantitative Child's risk class during 5 years. An increase or decrease in 2 or more Child's class points reflected, respectively, improvement or worsening of liver function. In every year, there was a statistically significant difference between alcoholic and nonalcoholic cirrhosis, with the patients with alcoholic cirrhosis having more frequent improvement and less frequent worsening of liver function than the patients with nonalcoholic cirrhosis ($p=0.005$ to <0.001). Overall, the 1 to 5 year average change in Child's class comparing alcoholic versus nonalcoholic cirrhosis, respectively, showed improvement in 68% versus 21%, and worsening in 8% versus 16% ($p<0.001$).

Direct Cost of Care—Table 4 shows the charges for hospitalization and outpatient care in thousands of U.S. dollars in patients with alcoholic and nonalcoholic cirrhosis who were randomized to EPCS. The mean grand total charges during the entire length of the study were \$151,000 in patients with alcoholic cirrhosis and \$147,600 in patients with nonalcoholic cirrhosis, an insignificant difference ($p=0.79$). The mean grand total charges per year amounted to \$38,300 in the alcoholic cirrhotics and \$43,000 in the nonalcoholic cirrhotics, a difference that favored the alcoholics but was not significant ($p=0.97$).

DISCUSSION

The notion that patients with BEV due to alcoholic cirrhosis have a significantly lower survival rate in response to portal-systemic shunts than patients with nonalcoholic cirrhosis has been promulgated widely for over 3 decades [9–14]. As a consequence, it has been advised to avoid portal-systemic shunts in patients with alcoholic cirrhosis, the single largest group of patients with BEV and the group that accounts for the largest number of early and long-term deaths. Information in support of this proposal has come mainly from retrospective, unrandomized studies of elective treatment of BEV by portal-systemic shunts. Explanations of this notion have been largely speculative. As recently as year 2008, a report of a randomized controlled trial of elective portal-systemic shunt versus transjugular intrahepatic portal-systemic shunt in selected patients with well-compensated liver disease stated “Patients with alcoholic liver disease have been shown to have a worse prognosis following DSRS than non-alcoholic patients have [26] and the current study stratified patients to control this variable” [14].

Table 5 summarizes the extensive studies comparing alcoholic versus nonalcoholic cirrhosis that we performed in patients with EPCS as part of our RCT. No differences between alcoholic and nonalcoholic cirrhotic patients were observed in regard to permanent control of bleeding, requirement for PRBC transfusion, early and long-term survival rate, incidence of recurrent PSE, and the cost of care as reflected by all charges for care. The only category in which there was a difference between alcoholics and nonalcoholics was in long-term liver function, and it favored patients with alcoholic cirrhosis.

The validity of our data is underwritten by the protocol of the San Diego BEV Study. It was a RCT that involved unselected, consecutive patients with BEV due to cirrhosis of the liver. There were no exclusions related to the severity of liver disease. Diagnosis and treatment were instituted within 8 hours of admission to the hospital. Regular follow-up was 100% and in 96% of patients lasted for 10 or more years or until death.

It should be pointed out that our findings are based on a study of emergency treatment of BEV. However, there is good reason to propose that these findings are applicable to patients undergoing elective treatment of BEV. In point of fact we examined the issue of alcoholic versus nonalcoholic cirrhosis in an unrandomized study of 1300 patients who underwent direct portacaval shunts for BEV, 700 electively and 600 as an emergency [19]. We found no differences between alcoholics and nonalcoholics in any of the outcome parameters including control of bleeding, survival, PSE and effect on liver function.

As a final note, explanatory comment is warranted about two aspects of our RCT, namely, (1) use of EST rather than endoscopic variceal ligation (EVL) as the emergency endoscopic treatment of BEV, and (2) absence of transjugular intrahepatic portosystemic shunt (TIPS). Some workers have suggested that EST has been replaced by endoscopic variceal ligation (EVL) and vasoactive drug therapy as the treatment of choice for BEV in both emergency and elective circumstances. It has been concluded by some that, compared to EST, EVL eradicates varices more rapidly, results in a lower rate of recurrent bleeding, and causes fewer complications. Nevertheless, our use of EST has received strong support from studies published in 2003, 2005, and 2006 that have questioned replacement of EST by EVL [20–23]. We discussed this issue and the justification for our use of EST in our recent publications [15,16]. It is noteworthy that recent trials have reported a significantly higher failure rate with band ligation of actively bleeding varices, and an overall higher recurrence rate of varices treated by EVL [21,22]. It is noteworthy that none of 9 randomized clinical trials observed a statistically significant difference in survival rate between EVL and EST [21]. In a recent meta-analysis of emergency EST in 40 trials involving 4031 patients reported by Triantos and colleagues in 2006, there was no statistically significant difference in survival rate between EVL and EST [23]. Currently, in our four-county referral community of 8.5 million people, gastroenterologists with whom we have had regular and frequent contact use EST more frequently than EVL. At the time when EVL was introduced at our institution, we were well into our RCT and made the decision not to change from EST to EVL.

With regard to TIPS, which was popularized long after our RCT was initiated, it has become the most widely used procedure of choice when it is believed that portal decompression is indicated. However, as we have pointed out previously, TIPS has a high rate of stenosis and occlusion, a resultant high incidence of PSE, and limited durability. The TIPS occlusion rate has been reduced by the recent introduction of the polytetrafluorethylene-coated stent, but the rates of occlusion and PSE are still much higher than the incidences of these serious complications following portacaval shunt observed in all of our studies. Recently, we completed a RCT comparing TIPS and EPCS and are in the process of analyzing the data for publication.

In conclusion, the results of the San Diego BEV Study indicate that EPCS is an effective first line emergency treatment of BEV in all common forms of cirrhosis, including alcoholic liver disease. We find no basis for the contention that patients with alcoholic cirrhosis tolerate portal systemic shunts less well than those with nonalcoholic cirrhosis.

ABBREVIATIONS

RCT	randomized controlled trial
BEV	bleeding esophageal varices
EST	endoscopic sclerotherapy
EPCS	emergency portacaval shunt
PCS	portacaval shunt
UGI	upper gastrointestinal
ICU	intensive care unit
PRBC	packed red blood cells
PSE	portal-systemic encephalopathy
EVL	endoscopic variceal ligation
TIPS	transjugular intrahepatic portosystemic shunt

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CONSORT Flow Diagram

Figure 1. Consort flow diagram showing the overall design and conduct of the prospective randomized controlled trial [17,18].

Table 1

Control of bleeding and survival comparing alcoholic versus nonalcoholic cirrhosis in unselected patients randomized to emergency portacaval shunt (EPCS) for acutely bleeding esophageal varices.

	Alcoholic Cirrhosis (n=87)	Nonalcoholic Cirrhosis (n=18)	p Value
Permanent control of bleeding – n (%)			
Indeterminate – nonbleeding death ≤ 14 days	10 (11)	2 (11)	1.0
Indeterminate – nonbleeding death ≤ 30 days	14 (16)	2 (11)	0.73
Successful control by primary therapy			
Excluding indeterminates for at least 14 days	77 (100)	16 (100)	1.0
Excluding indeterminates for at least 30 days	73 (100)	16 (100)	1.0
> 30 days	73 (100)	16 (100)	1.0
Units PRBC Transfusion – mean/median (range)			
Index hospitalization			
Before EPCS	5.91/6.0 (2–12)	5.17/4.5 (2–17)	0.11
During EPCS	5.74/4.0 (0–26)	9.00/1.5 (0–68)	0.055
Post-EPCS bleeding:			
Variceal	0/0 (0–0)	0/0 (0–0)	NA
non-variceal	1.89/0 (0–29)	1.05/0 (0–10)	0.95
Total PRBC units	14.92/10.0 (2–49)	15.33/6.0 (3–81)	0.032*
Total PRBC units (entire course):			
For variceal bleeding	13.37/10.0 (2–47)	14.50/6.0 (3–73)	0.020*
For variceal and non-variceal bleeding	17.82/15.0 (2–49)	17.89/8.0 (3–81)	0.067
Survival			
Overall survival (Pr/95% CI)			0.90
30 days	0.85 (0.78, 0.92)	0.89 (0.75, 1.0)	
5 year	0.71 (0.62, 0.81)	0.78 (0.61, 1.0)	
10 year	0.43 (0.34, 0.55)	0.50 (0.32, 0.79)	
Median survival – years (95% CI)	6.03 (5.31, 11.02)	6.24 (5.43, >10.68)	0.90
Hazard ratio of death (95% CI)	1.0	1.04 (0.57, 1.91)	
Survival by Child's risk class (Pr/95% CI)			
5 years			
A (Alc. n=14, Nonalc. n=12)	0.86 (0.69, 1.0)	0.92 (0.77, 1.0)	
B (Alc. n=45, Nonalc. n=4)	0.76 (0.64, 0.89)	0.75 (0.43, 1.0)	
C (Alc. n=28, Nonalc. n=2)	0.67 (0.42, 0.79)	0.00 (NA, NA)	
10 years			
A (Alc. n=14, Nonalc. n=12)	0.50 (0.30, 0.84)	0.75 (0.54, 1.0)	
B (Alc. n=45, Nonalc. n=4)	0.49 (0.36, 0.66)	0.00 (NA, NA)	
C (Alc. n=28, Nonalc. n=2)	0.32 (0.19, 0.55)	0.00 (NA, NA)	
Median survival – years (95% CI)			
A (Alc. n=14, Nonalc. n=12)	5.91 (5.28, >13.9)	10.34 (6.12, >10.68)	0.95
B (Alc. n=45, Nonalc. n=4)	6.17 (5.25, 11.02)	6.03 (0.00, >6.19)	0.21

	Alcoholic Cirrhosis (n=87)	Nonalcoholic Cirrhosis (n=18)	p Value
C (Alc. n=28, Nonalc. n=2)	5.25 (0.19, >10.16)	0.002 (0, NA)	0.003*

PRBC, packed red blood cells; EPCS, emergency portacaval shunt

* Statistically significant difference

Table 2

Recurrent PSE in patients randomized to EPCS who survived >30 days and were discharged from the hospital comparing alcoholic versus nonalcoholic cirrhosis

	Alcoholic Cirrhosis (n=72)	Nonalcoholic Cirrhosis (n=16)	p Value
<u>Incidence of recurrent PSE – n (%)</u>	10 (14)	3 (19)	0.70
<u>Length of survival</u>			0.91
Total days	221,658	48,269	
Total years	606.9	132.2	
Total days/patient	3078.6	3016.8	
Total years/patient	8.43	8.26	
<u>Recurrent PSE Episodes</u>			0.73
Total episodes – n (n/person)	80 (1.11)	14 (0.88)	
Episodes per year of follow-up	0.13	0.11	
Interval between episodes (years)	7.59	9.44	
<u>Hospital readmissions for recurrent PSE</u>			0.69
Total readmissions – n (n/person)	74 (1.03)	13 (0.81)	
Readmissions per year of follow-up	0.12	0.10	
Interval between readmissions (years)	8.20	10.17	
<u>RELATIONSHIP OF PSE TO SURVIVAL</u>			
Survival of patients free of PSE – years (median, 95% CI)	10.37 (6.17, Inf)	10.34 (6.12, Inf)	1.0
p Value (recurrent PSE vs. no PSE)	<0.001*	<0.001*	
<u>HIGH PSE INDEX – n (%)</u>			
Patients with PSE index ≥0.33	10 (14)	2 (13)	1.0
Patients with PSE index ≥0.33 who had recurrent PSE clinically	3 (30)	1 (50)	1.0
Main cause of recurrent PSE episodes – n (%)			
Dietary protein indiscretion	51 (61)	9 (64)	1.0

* statistically significant difference

Table 3

Changes in Child's Class Compared to Child's Class on Study Entry Comparing Alcoholic Versus Nonalcoholic Cirrhosis.

Years After Study Entry	Changes in Child's Classes – A, B and C Combined	Alcoholic Cirrhosis	Nonalcoholic Cirrhosis	p Value
	Number of patients	74	15	0.005*
1	Improved – n (%)	50 (68)	3 (20)	
	Unchanged – n (%)	15 (20)	11 (73)	
	Worse – n (%)	9 (12)	1 (7)	
	Number of patients	66	16	<0.001*
2	Improved – n (%)	47 (71)	3 (19)	
	Unchanged – n (%)	14 (21)	10 (62)	
	Worse – n (%)	5 (8)	3 (19)	
	Number of patients	63	14	0.003*
3	Improved – n (%)	41 (65)	3 (21)	
	Unchanged – n (%)	17 (27)	8 (57)	
	Worse – n (%)	5 (8)	3 (21)	
	Number of patients	61	14	0.004*
4	Improved – n (%)	42 (69)	3 (21)	
	Unchanged – n (%)	14 (23)	10 (71)	
	Worse – n (%)	5 (8)	1 (7)	
	Number of patients	62	14	<0.001*
5	Improved – n (%)	42 (68)	3 (21)	
	Unchanged – n (%)	18 (29)	7 (50)	
	Worse – n (%)	2 (3)	4 (29)	
	Number of patients	74	15	<0.001*
1–5 Year	Improved – %	68	21	
Average	Unchanged – %	24	63	
	Worse – %	8	16	

* statistically significant difference. Changes indicate an increase or decrease of 2 or more Child's class points.

Total facility and professional fee charges for patients in the EPCS arm, comparing alcoholic versus nonalcoholic cirrhosis

Table 4

Total Charges and Charges per Day or per Year in \$1000s	Alcoholic Cirrhosis		Nonalcoholic Cirrhosis		P Value
	n	Mean and (Std. Dev.)	Range	Mean and (Std. Dev.)	
<u>INDEX ADMISSION</u>	87				
1. Total Hospital Charges		73.2 (59.9)	23.1–352.6	49.6 (24.5)	27.4–136.8 0.039 *
Hospital Charges per Day		5.32 (3.89)	2.35–26.61	6.96 (11.44)	1.98–52.06 0.66
2. Total Physician Charges		11.5 (5.7)	3.3–34.8	8.9 (3.2)	3.7–16.0 0.060
Physician Charges per Day		1.05 (1.20)	0.16–7.28	1.09 (1.27)	0.33–6.06 0.69
3. Total Overall Charges		84.7 (64.0)	33.7–380.5	58.5 (26.4)	34.8–150.6 0.015 *
Overall Charges per Day		4.85 (4.91)	2.71–33.4	8.05 (12.68)	2.41–58.11 0.69
<u>READMISSION POST-INDEX</u>	72				
1. Total Hospital Charges		53.2 (69.6)	0–247.4	71.8 (78.9)	0–262.0 0.17
Hospital Charges per Year		18.8 (45.0)	0–262.3	27.4 (62.1)	0–240.4 0.31
2. Total Physician Charges		8.2 (10.2)	0–38.9	10.6 (11.9)	0–49.2 0.21
Physician Charges per Year		2.6 (6.1)	0–35.8	2.7 (4.5)	0–16.0 0.27
3. Total Overall Charges		61.4 (79.1)	0–284.2	82.4 (87.9)	0–274.5 0.17
Overall Charges per Year		21.5 (50.9)	0–298.1	30.1 (65.9)	0–251.8 0.30
<u>OUTPATIENT POST-INDEX</u>	72				
1. Total Hospital Charges		8.7 (5.0)	0–27.7	7.0 (4.6)	0–19.1 0.14
Hospital Charges per Year		1.4 (1.2)	0–7.5	0.9 (0.7)	0–3.3 0.11
2. Total Physician Charges		6.4 (3.4)	0–12.2	5.5 (4.3)	0–12.8 0.38
Physician Charges per Year		0.8 (0.4)	0–2.2	0.7 (0.6)	0–2.7 0.27
3. Total Overall Charges		15.1 (7.3)	0–33.2	12.5 (8.6)	0–31.9 0.20
Overall Charges per Year		2.2 (1.5)	0–9.5	1.6 (1.3)	0–6.0 0.066
<u>TOTAL POST-INDEX CHARGES</u>	72	76.5 (78.3)	0–302.0	98.9 (87.1)	6.6–283.5 0.27
Total Post-Index Charges per Year		23.7 (51.5)	0–302.1	31.7 (66.0)	1.1–251.8 0.43
<u>GRAND TOTAL CHARGES</u>	72	151.0 (103.7)	45.0–682.5	147.6 (89.3)	41.4–336.3 0.79
Grand Total Charges Per Year		38.3 (48.7)	2.6–374.5	43.0 (80.2)	4.9–303.8 0.97

* Statistically significant difference

After index admission, patients who died during index admission were excluded.

Table 5

Summary comparison of alcoholic versus nonalcoholic cirrhosis in patients treated by EPCS for BEV.

Criterion	Alcoholic Cirrhosis	Nonalcoholic Cirrhosis	P-value	Conclusion
Permanent control of bleeding	100%	100%	1.0	No difference
Total PRBC units- mean	17.82	17.89	0.067	No significant difference
Survival				
– Mean 5 year rate	0.71	0.78	0.90	No difference
– Median years	6.03	6.24	0.90	No difference
Recurrent PSE				
– Incidence	14%	19%	0.70	No difference
– PSE Index ≥0.33	14%	13%	1.0	No difference
Change in Child's Class – 1–5 year average				Alcoholic superior to nonalcoholic
– Improved - %	68%	21%	<0.001*	
– Worse - %	8%	16%	<0.001*	
Cost of care charges - \$1000s				
– Grand total - Mean	151.0	147.6	0.79	No difference
– Grand total per yr - Mean	38.3	43.0	0.97	No difference