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ORIGINAL ARTICLE

Effect of Serum SAAG Ratio on the Outcome of Diagnosed Patients with (SBP) Spontaneous Bacterial Peritonitis in Comparison to their CTP & Meld Classification

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ABSTRACT

Objective: To investigate the serum albumin levels among hospitalized patients of chronic Liver disease (CLD) having SBP in Asian Institute of Medical Sciences Hospital Hyderabad, detecting early can potentially reduce its outcome of In-Hospital Mortality.

Methodology: The descriptive case series study was conducted from January 2019 to June 2019 at Gastroenterology ward of Asian Institute of Medical Sciences, Hyderabad. All cases of CLD having spontaneous bacterial peritonitis and either of gender were enrolled in the study. Cirrhosis stages were assessed by CTP (Child-Turcot-Pugh) score and MELD (Model for End-stage Liver Disease) score. Serum levels of albumin were taken under the supervision of well-trained staff nurse(s) by following all guideline protocols and taking care of every risk factor and error for minimizing the bias results. The data was analyzed using SPSS version 20.

Results: Mean age of the patients was 47.56±13.069 years. sampled serum albumin levels were found less than 2.0mg/dl have much higher in-hospital mortality rate compared to those having serum albumin levels more than 3.0mg/dl. There were also significant differences in outcome (in-hospital mortality) seen among the gender groups: Male vs. female; in-hospital death 42/165 vs. 19/58 (p-0.283). Hospital mortality was significantly high in CTP-C patients compared to CTP-B patients (59/185 vs. 02/38, (p-0.001). Early detection of high-risk patients is critical for better prognosis.

Conclusion: It was observed that, there is a high prevalence of cirrhosis and its complications and a significant relationship of in-hospital mortality among patients of SBP and their SAAG (serum Albumin ratios), which clearly signifies that those patients who have serum Albumin ratio lesser than 2.0mg/dl have higher in-hospital mortality as compared to those have serum Albumin ratio lesser than 2.1-3.1mg/dl and more than 3.0mg/dl.

Keywords: Cirrhosis, Albumin, Mortality

INTRODUCTION

In hospitalized cirrhotic patients, bacterial infections are a leading cause of mortality and morbidity. Bacterial infection raises fourfold the likelihood of death of the individuals having decompensated cirrhosis, arriving at a 30% death rate after the principal month and 63% after the 1st year of the follow-up.[1] Spontaneous bacterial peritonitis (SBP) is an all-around perceived and predominant complication seen in the patients of cirrhosis with ascites, happening in 10–25% of these patients.[2] Despite the fact that patients usually present with manifestations to demonstrate the presence of the infection, like abdominal pain, leucocytosis or fever, as many as 33% of the cases present without localized symptoms.[3] SBP related mortality has stayed still similar[4] and in the wake of evaluating records of 350 cases having SBP admitted to Maryland Hospitals during a time of the 10-year, SBP had been observed to be the subsequent driving reason for bacterial-related mortality amongst hospitalized cases with a 33% death rate.[5] Spontaneous bacterial peritonitis' survivors having very poor prognosis also. After an underlying analysis of SBP related mortality rate as, 33% at 1-month, 50% at half year and 58% at 1-year.[6] Translocation of micro-organisms and end poisons from the gastrointestinal tract to the fluid of the peritoneum is accepted to be a vital component behind the advancement of spontaneous bacterial peritonitis and is worked with by weakened mechanism of defence in the patients of cirrhosis.[3] SAAG is a best single test for classification of the ascites into the portal hypertensive (SAAG >1.1 g/dL) and those having no portal hypertensive (SAAG < 1.1 g/dL) reasons. Determined by deducting the ascitic fluid levels from the serum albumin levels, it connects straightforwardly with the entrance pressure. Specimens ought to be acquired generally simultaneously. The precision of the SAAG results is around 97% in characterizing ascites. The terms low-albumin gradient and high-albumin gradient should substitute ought to supplant the terms transudative and exudative in ascitic description.[8] Several prognostic models have been projected to estimate the rate of mortality from cirrhosis, comprising the broadly used Child–Pugh classification and the model for end-stage liver sickness (MELD).[9] MELD score is a universally accepted prognostic score to assess disease severity and survival in end stage liver disease. Although there are limited data that correlate MELD score and risk of SBP directly and more studies are recommended.[10] Hence, this study has been conducted to assess the serum SAAG ration among hospitalized patients with (CLD) Chronic liver disease having SBP in Asian Institute of Medical Sciences Hospital Hyderabad, detecting early can reduce its outcome of In-Hospital Mortality.

METHODOLOGY

The Descriptive case series study was conducted from 01st January 2019 to 30th June 2019 at Gastroenterology ward of Asian Institute of Medical Sciences, Hyderabad. A total of 223 patients of spontaneous bacterial peritonitis who fulfil the inclusion criteria were enrolled over the study period. All the cases of CLD having spontaneous bacterial peritonitis and either of gender were enrolled in the study. All the patients having bleeding variceal, patients having hepatocellular carcinoma, pregnant females, abdominal tuberculosis or malignancy, patients having contraindication of endoscopy and those who were not agreeing to participate in the study were excluded. The stage of cirrhosis was assessed by CTP (Child-Turcot-Pugh) score and MELD (Model for End-stage Liver Disease) score. Serum levels of Albumin were taken under the supervision of well-trained staff nurse(s) by following all guideline protocols and taking care of every risk factor and error for minimizing the bias results. The data was analyzed by using SPSS 21.0

RESULTS

A total of 223 patients with spontaneous bacterial peritonitis were studied, their mean age was 47.56 ± 13.06 years and 74% were males. Most common etiology for CLD was Hepatitis C 57.4% followed by Hepatitis B 11.7%, Hepatitis B + D 3.5% and Alcohol 3.6%. CTP class was B in 17% patients and CTP class C in the rest 83%. Mean MELD score of all patients was 23.09±15.686. Table.1

Table 1: Demographic characteristics of the patients n=223

Variables		Statistics
Age		47.56± 13.069
BMI		30.45±3.69
MELD score		23.09 ±15.6
Gender	Males	165 (74%)
	Females	58 (26%)
Etiology	HCV	128 (57.4%)
	HBV	26 (11.7%)
	HBV+ delta virus	30 (13.5 %)
	Alcohol	8 (3.6 %)
Systolic BP:		135± 15.19
Diastolic BP		91± 8.79
FBS		149± 21.09
RR		16.8± 4.21
Arterial blood pH		7.46± 0.046

Out of 223 patients, in-hospital mortality was observed in 61 (27.4%), 115 (51.6%) were discharged with improvement and rest of the patients 47 (21.1%) discharged with same condition. Table.2

Table 2. Outcome of the patients n=223

Variables	Statistics
In-hospital mortality	61(27.4%)
Discharged with improvement	115 (51.6%)
Discharged with same condition	47 (21.0%)

There was significant difference of outcome seen with bilirubin >5mg/dl vs <3mg/dl (37% vs. 16%, p = 0.004), Albumin >3.0 vs <2.0 (13% vs. 48%, p = <0.001), PT >24 sec vs <18 sec (40% vs. 17%, p = 0.004), Creatinine >3.0mg/dl vs <1.5 (43% vs. 13%, p = <0.001), Platelets >200 vs <50 (19% vs. 41%, p = 0.051). Mortality was significantly high in CTP-C patients as compared to CTP-B patients (59/185 vs. 02/38, p = 0.001). CTP class was B in 38 (17 %) patients and CTP class C in the rest 185 (83 %) as shown in table 3.

Table: 3. Hospital mortality according to serum creatinine, total bilirubin, albumin, platelets and prothrombin n=223

Variables	Mean	values	In-hospital mortality
Creatinine (mg/dl)	1.90± 1.41	<1.5	13%
		1.5-2.0	35%
		2.1-3.0	42%
		>3.0	43%
Total bilirubin (mg/dl)	5.88± 7.53	1-3.0 mg/dl	16%
		3.1-5 mg/dl	35%
		>5mg/dl	37%
Albumin (g/dl)	2.±0.51	<2.0	48
		2.1-3.0	21
		>3.0	13
Platelets (10^3/uL)	105.41±73.85	<50	41%
		51-100	27%
		100-200	19%
		>200	19
Prothrombin time (seconds)	21.77± 8.65	12-18	17%
		19-24	33%
		>24	40%

DISCUSSION

The Hospital mortality rate of the cirrhotic cases with infection is around 15%, without is double fold higher than non-infected cirrhotic patients.[13] SBP is the major and a significant complication of cirrhotic liver with ascites, with an incidence of around 10 to 30%.[3] Risk development of the Spontaneous Bacterial Peritonitis is more noteworthy in those with simultaneous bleeding form gastrointestinal tract, raised level of serum bilirubin, a past scene of Spontaneous Bacterial Peritonitis, or decreases ascitic liquid protein fixation (under 1gm/dl). Its death rate has been diminished from 80 to 30% because of early diagnosis and inception of satisfactory treatment.[14] In this study, the average age of study subjects was 47.56± 13.069 and males were in the majority 165 (74%). Similarly, Kumar S et al[15] reported that the average age of the cases was 44.59 ± 13.55 years and out of all cases males were 62% and females were 38%. In a study by Ahmed M et al[16] reported that the average age of the patients was 46.22 ± 2.29 years and males were in the majority of 53% and females were 47%. Cervantes Pérez E et al[17] reported that the mean age of the case was 54.0 ± 13.6 years and males were 84%. In this study most common etiology for CLD was Hepatitis C 128 (57.4%) followed by Hepatitis B 26 (11.7%), Hepatitis B + D 30 (13.5 %) and Alcohol 8 (3.6 %). However, Kumar S et al[15] reported that the commonest cause was HCV 53% followed by HBV 34%, HBV+HDV was 8% and in 5% cases HBV and HC were not detected. In this study mean albumin level was 2± 0.51437 g/dl. Kumar S et al[15] reported an average Albumin serum level was 2.87 ± 0.34g/dl. Although in the study of Verma RK etal[18] reported that the average serum albumin level in SBP patients was 2.54±0.33g/dl.

In this series, the overall in-hospital death rate was observed 27.4% among patients having SBP, this rate is almost equal to report by several previous cohort studies. Female (33%) gender has high in-hospital death compared to male (25%). Baseline liver diseases were analyzed according to the mortality outcome. CTP-C (32%) has the highest mortality compared to CTP-B (5%). Bilirubin >8mg/dl, INR > 2 minutes, PT > 24 seconds, creatinine > 2.4mg/dl and MELD > 30 is associated with high in-hospital mortality. Our results match those of Thuluvath et al. from 2001 in that in-hospital mortality were 32.6% and old age cases were linked to higher in-hospital death while race was not assessed as a risk factor for mortality with SBP mortality in current study. Although, inconsistently to Thuluvath et al. we also observed a raised mortality in advanced liver disease (CTP-C and MELD >30). Our results also match Niu B et al. and Heo J et al. studies with high MELD and female gender independent prognostic factor. The major difference was mean age of our study population was 47 years. Our in-hospital mortality rate was significantly higher may be due to late identification of disease and delay in treatment. We suggest proper treatment in SBP and improved the resources in the sicker patients with a bedside diagnostic paracentesis to improve patient care. Several populations-based researches with respect to this subject have been done from different nations. One review from Spain detailed that the 16.9% hospital mortality related to SBP to information from the Catalan Health Service library using ICD-9-CM codes from 2003 to 2010.[19] The Spanish review was like our own in included time-frame, logical strategy, and revealed mortality. One more review from Taiwan, using the National Health Insurance Database, inspected the cross-country mortality of cirrhotic patients with SBP during 2004.[20]

CONCLUSION

It is observed that the significance relationship of in-hospital mortality among patients of SBP and their SAAG (serum Albumin ratios), which clearly signifies that those patients who have serum Albumin ratio lesser than 2.0mg/dl in-hospital mortality as compared to those have serum Albumin ratio lesser than 2.1-3.1mg/dl more than 3.0mg/dl. Serum Albumin plays a very huge role outcome prediction of hospitalized patient of SBP. Moreover, Albumin therapy can increase the rate of survival and reduces the rate of renal impairment. Proper and timely management of the SBP is very important, not only because it improves the cirrhotic patients' quality of life, but also prevents the other complication like renal impairment, HRS and the septic shock.

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