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ORIGINAL ARTICLE

Clinical Outcomes of Acute Pancreatitis in Patients with Cirrhosis

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ABSTRACT

Background and Aim: Acute Pancreatitis (AP) is a common disease requiring hospitalization. Though the mortality rate caused by pancreatitis decreased over the past few decades but patient's organ failure causing mortality during acute pancreatitis is on the rise. The present study intended to assess the outcomes of acute pancreatitis in cirrhosis patients.

Patients and Methods: This retrospective study was carried out on 180 acute pancreatitis patients admitted in the General Medicine and Gastroenterology Department of Central Hospital, Stadium Road Sargodha, Hayatabad Medical Complex Peshawar and Shaikh Khalifa bin Zayed Hospital, Muzaffarabad AJK for the duration from November 2021 to September 2022. Cirrhotic and non-cirrhotic patients were matched based on Propensity score matching (1:2). Inpatient mortality, systemic inflammatory response syndrome, length of hospital stay (LOS), and organ failure were the main outcomes. Model of End-stage Liver Disease (MELD) and Child-Pugh scores was used for cirrhotic patient's subgroup analysis.

Results: Of the total 180 AP patients, there were 60 cirrhotic (male 31 and females 29) and 120 (male 62 and females 58) non-cirrhotic patients. Based on Child-Pugh scores, the incidence of Child–Pugh scores A, B, and C was 17 (28.3%), 27 (45%), and 16 (26.7%) respectively. Based on cirrhosis etiology, the incidence of NAFLD (non-alcoholic fatty liver disease) , chronic hepatitis C, and autoimmune causes were 12 (20%), 42 (70%), and 6 (10%) respectively. Regarding diagnosis criteria, abdominal imaging diagnosed 56 (93.3%) patients whereas 4 (6.7%) were diagnosed based on liver biopsy. The mean BMI value in cirrhotic and non-cirrhotic groups was 28.4 and 26.8 kg/m^2, p=0.51). Based on acute pancreatitis etiology, the incidence of gallstone-induced, idiopathic, and other in cirrhotic versus non-cirrhotic was 32 (53.3%) vs. 68 (56.7%), 12 (20%) vs. 30 (25%), and 16 (26.7%) and 22 (18.3%) respectively. Cirrhotic and non-cirrhotic patients' outcomes such as inpatient mortality (6.8% vs. 1.7%), systemic inflammatory response syndrome (SIRS) (23.3% vs. 34.2%), and organ failure (13.3% vs 4.2%).

Conclusion: The present study concluded the overall mortality and morbidity rates for cirrhotic and non-cirrhotic hospitalized with AP were similar. However, cirrhosis-related complications, portal hypertension and immunosuppression state such as sepsis, infections, and variceal bleed are likely to contribute to poorer outcomes and higher mortality compared to non-cirrhotic.

Keywords: Acute pancreatitis, outcomes, acute liver injury

INTRODUCTION

Although the fatality incidence of pancreatitis has fallen substantially in recent decades as awareness of the disease has progressed, the individual's mortality rate remains high due to organ failure in severe AP patients [1]. The severe acute pancreatitis (SAP) mortality rate ranges from 15% to 35% [2, 3]. Fulminant Liver failures have been found reported in about 5% cases of severe AP [4, 5]. SAP, which is distinguished by rapid development and various comorbidities, frequently results in a high death rate as a result of hyper metabolism, multiple organ dysfunction syndrome (MODS), and systemic inflammatory response syndrome (SIRS). AP associated mortality could be caused by two waves i) first one is associated with MODS development in a spam of one week whereas ii) second one mainly rely on infections [6, 7]. AP severity is significantly associated with liver damage severity and incidence irrespective of individual may not develop MODS. According to a prior publication, the death rate of SAP patients due to liver failure might reach 83% [8].

Acute pancreatitis (AP) is the most prevalent gastrointestinal disorders. Numerous investigations have revealed that prevalence of AP is on the rise without knowing their associated risk factors for such increase [9, 10]. Another most prevalent gastrointestinal disorders and major contributor to public health issue was cirrhosis imposing financial burden on health care system. Cirrhosis is projected to affect about 800 million individuals worldwide, with a yearly mortality rate of 2 million fatalities [11]. There is paucity of data on AP association with cirrhosis based on liver disease varying degree. The pathophysiology of AP inflammation is distinct and complicated, culminating in significant capillary leakage and fuid extravasation into the third space, severe intravascular volume depletion, pancreatic ischemia, necrosis, and multi-organ failure [12, 13]. As a result, we aimed to explore the results of AP in cirrhotic patients, as well as their mortality and accompanying morbidity.

METHODOLOGY

This retrospective study was carried out on 180 acute pancreatitis patients admitted in the General Medicine and Gastroenterology Department of Central Hospital, Stadium Road Sargodha, Hayatabad Medical Complex Peshawar and Shaikh Khalifa bin Zayed Hospital, Muzaffarabad AJK for the duration from November 2021 to September 2022. Cirrhotic and non-cirrhotic patients were matched based on Propensity score matching (1:2). Inpatient mortality, systemic infammatory response syndrome, length of hospital stay (LOS), and organ failure were the main outcomes. Model of End-stage Liver Disease (MELD) and Child-Pugh scores was used for cirrhotic patient's subgroup analysis. Adjustments were made for age, gender, and the severity of AP. Cirrhosis was modelled as the outcome in a logistic regression model, with age, BMI, gender, fuid overload comorbidities, and AP etiology as independent variables. The propensity score represented the probability of developing cirrhosis, and a closest neighbour optimum matching method individual best match. For continuous variables, data are reported as mean standard deviation or median and frequency for categorical elements. A subgroup study of cirrhotic individuals was performed to investigate differences between Model of End-Stage Liver Disease (MELD) score of <10 vs ≥10 and (1) Child-Pugh class A vs. B/C and. Continuous parameters were compared using ANOVA test whereas categorical variables were analyzed using Chi-square test.

RESULTS

Of the total 180 AP patients, there were 60 cirrhotic (male 31 and females 29) and 120 (male 62 and females 58) non-cirrhotic patients. Based on Child-Pugh scores, the incidence of Child–

Pugh scores A, B, and C was 17 (28.3%), 27 (45%), and 16 (26.7%) respectively. Based on cirrhosis etiology, the incidence of NAFLD (non-alcoholic fatty liver disease) , chronic hepatitis C, and autoimmune causes were 12 (20%), 42 (70%), and 6 (10%) respectively. Regarding diagnosis criteria, abdominal imaging diagnosed 56 (93.3%) patients whereas 4 (6.7%) were diagnosed based on liver biopsy. The mean BMI value in cirrhotic and non-cirrhotic groups was 28.4 and 26.8 kg/m^2, p=0.51). Based on acute pancreatitis etiology, the incidence of gallstone-induced, idiopathic, and other in cirrhotic versus non-cirrhotic was 32 (53.3%) vs. 68 (56.7%), 12 (20%) vs. 30 (25%), and 16 (26.7%) and 22 (18.3%) respectively. Cirrhotic and non-cirrhotic patient's outcomes such as inpatient mortality (6.8% vs. 1.7%), systemic infammatory response syndrome (SIRS) (23.3% vs. 34.2%), and organ failure (13.3% vs 4.2%). Table-I represents the Cirrhotic individuals hospitalized for acute pancreatitis: characteristics. Table-II represent the baseline characteristics of cirrhotic and non-cirrhotic patients. Cirrhotic patients' characteristics: Child-Pugh class A vs. B/C is shown in Table-III. Table-IV represents the Cirrhotic patients' characteristics: MELD <10 vs. ≥10. Outcomes of cirrhotic and non-cirrhotic patients are shown in Figure-1.

Table-1: Characteristics of Cirrhotic individuals hospitalized for acute pancreatitis

Characteristics	Cirrhotic patients (N=60)
Cirrhotic etiology	60
NAFLD	12 (20)
Hepatitis C	42 (70)
Autoimmune	6 (10)
Child-Pugh Class	
A	17 (28.3)
B	27 (45)
C	16 (26.7)
MELD Score	60
<10	14 (23.3)
≥10	46 (76.7)

Table-2: baseline characteristics of cirrhotic and non-cirrhotic patients.

Characteristics	Cirrhotic (N=60)	Non-cirrhotic (N=120)	P-value
Age (years)	56.6±7.9	60.7± 16.8	0.29
Gender			0.68
Male	31	62	
Female	29	58	
BMI (kg/m^2)	26.8±6.8	25.6±7.2	0.49
AP etiology			0.79
Gallstone-induced	32 (53.3)	68 (56.7)	
Idiopathic	12 (20)	30 (25)	
Other	16 (26.7)	22 (18.3)	

Table-3: Cirrhotic patients' characteristics: Child-Pugh class A vs. B/C

Characteristics	Child-Pugh A (N=17)	Child-Pugh B/C (N=43)	P-value
Age (years)	57.4±10.8	57.8 ± 5.9	0.89
Gender			0.49
Male	9 (52.9)	25 (57.1)	
Female	8 (47.1)	18 (41.9)	
BMI (kg/m^2)	27.8±3.8	26.9± 6.8	0.72
AP etiology			0.41
Gallstone-induced	10 (58.8)	27 (62.8)	
Idiopathic	6 (35.3)	12 (27.9)	
Other	1 (5.9)	4 (9.3)	

Table-4: Cirrhotic patients' characteristics: MELD <10 vs. ≥10.

Characteristics	MELD <10 (N=14)	MELD ≥10 (N=46)	P-value
Age (years)	57.2± 10.6	59.3±7.6	0.63
Gender			0.69
Male	8 (57.1)	24 (52.2)	
Female	6 (32.9)	22 (47.8)	
BMI (kg/m^2)	26.9± 4.2	27.4± 6.8	0.83
AP etiology			0.62
Gallstone-induced	8 (57.1)	24 (52.2)	
Idiopathic	4 (28.6)	15 (32.6)	
Other	2 (14.3)	7 (15.2)	

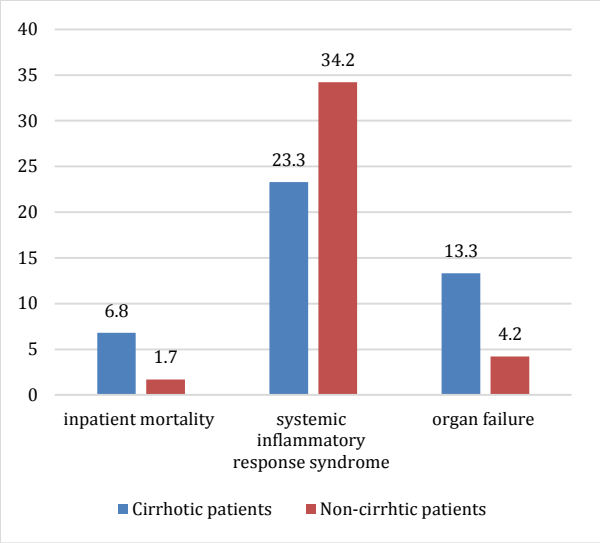

Figure-1: Outcomes of cirrhotic and non-cirrhotic patients

DISCUSSION

The present study mainly investigated the outcome of acute pancreatitis in patients with liver cirrhosis and found that cirrhotic patients with AP, their morbidity and mortality were comparable to non-cirrhotic. Cirrhosis-related complications, immunosuppression, such as sepsis, infections, and varietal hemorrhage, and portal hypertension are likely to lead to inferior outcomes and greater mortality when compared to non-cirrhotic patients. The current study suggests that individuals with cirrhosis may have poorer clinical outcomes when hospitalized with AP. Cirrhotic appear are more susceptible to die (mortality 6.8% vs. 1.7%), which compares with greater shock rates, ICU admission, and respiratory failure.

AP can affect the liver, but liver failure can also worsen the severity of AP. These findings were comparable to a previous studies [14, 15]. AKI is a common and devastating consequence of AP, as well as a significant predictor of morbidity and death in critically sick patients. The prognosis for AP patients with AKI is bleak, with death rates ranging from 25-75% [16, 17]. Renal illness and SAP can coexist as a result of systemic diseases that affect multiple organs, not only the kidney and pancreas. The pathogenesis of AKI in SAP patients is unknown and may involve a number of variables. Understanding the pathogenesis and diagnosis of AKI after SAP may enhance the treatment success of critically sick patients.

The AP associated infammatory process can progress through gastrohepatic ligament to the hilum and then along the Glisson sheath [18, 19]. AP patients with Liver perfusion anomalies may be induced by arterial blood increased flow caused by liver lobe or gallbladder inflammation [20]. Because the pancreatic body is often next to the liver's left lobe, AP can freely shift to the vesicle and reach the liver's left lobe via the gastro hepatic ligament [21].

AP infammation, particularly when acute, raises vascular permeability, resulting in fuid sequestration and capillary leakage. This fuid phenomenon third-spacing causes multi-organ failure, hypoperfusion, necrosis, pancreatic ischemia, eventually leading to shock. Mostly cases of AP are minor but the prevalence of severe AP varies from 10-20% with pancreatic necrosis and prolonged organ failure. SIRS is caused by AP, which can be transitory or chronic (lasting more than 48 hours) [22]. In the current study, there was a tendency towards a reduced frequency of SIRS among cirrhotic, which aligns with the majority of cirrhotic having moderate AP.

According to the findings of the current investigation, the majority of cirrhotic had moderate AP, which explain the AKI worsening absence that predict more severe AP in cirrhotic

physiology [23, 24]. Cirrhotic are predisposed to infections and sepsis due to portal hypertension problems [25], which may affect cirrhotic mortality throughout any other disease phase, including AP.

Additionally, appropriate AP treatment remains a problem, with various risk variables influencing AP results [26]. It is critical to identify these risk variables or groups that are more likely to have negative effects during an AP strike. The data described here is significant because it adds to AP clinical outcomes in cirrhotic patients and awareness of the adverse outcomes of cirrhotic patients with AP.

CONCLUSION

The overall mortality and morbidity rates for cirrhotic and non-cirrhotic hospitalized with AP were similar. However, cirrhosis-related complications, portal hypertension and immunosuppression state such as sepsis, infections, and variceal bleed are likely to contribute to poorer outcomes and higher mortality compared to non-cirrhotic.

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