

Pattern of Risk Factors and Complications of Acute Pancreatitis

Abdul Hafeez, Jawed Iqbal, Adil Hassan, Rehmatullah Bhatti, Bushra Kadir and Muhammad Sadik

Risk Factors and Complications of Acute Pancreatitis

ABSTRACT

Objective: The objective of this study was to determine the risk factors and local complications with outcome of acute pancreatitis in tertiary referral center.

Study Design: Descriptive study.

Place and Duration of Study: This study was conducted at the Department of Hepatology / Emergency, Asian Institute of Medical Sciences, Hyderabad from January 2021 to May, 2022.

Materials and Methods: All consecutive patients with acute pancreatitis over the age of 10. Ultrasound based GB stone, CBD dilatation and type of pancreatitis (interstitial and necrotic) were expressed in percentages. Outcomes (death of patient or improved and discharged) and etiologies were also calculated in percentages. Stratification with respect to age, gender, DM, Alcohol, CBD stone, GB stone, Type of pancreatitis CBD dilatation and Ascites (Present/absent) were performed.

Results: A total of 91 patients were enrolled, The Mean age of the study population was 40.22 ± 15.657 years (range: 13–75 years) and majority were female 49(53.8%). There were 45(49.5%) patient with normal basal mass index (BMI) followed by 35(38.5%) patient was obese, 9(9.9%) were overweight and 2(2.1%) were underweight. 44(48.4%) were idiopathic while Gall stones was found in 33(36.3%) patients and alcoholism in 9(9.9%) patients. Pancreatic collection was the common complication in 12(13.2%) patients, these cases were identified as acute pancreatitis. When risk factors and local complication were associate with outcome, the p value < 0.02 was significant only for local complication while there was no significant association with any risk factors

Conclusion: The findings of this study indicate that more studies need to be undertaken to determine the obesity paradox and the relationship between risk factors and outcomes.

Key Words: Pattern of Acute Pancreatitis, risk factors, local complications

Citation of article: Hafeez A, Iqbal J, Hassan A, Bhatti R, Kadir B, Sadik M. Pattern of Risk Factors and Complications of Acute Pancreatitis. Med Forum 2023;34(9):127-130 .doi:10.60110/medforum.340930.

INTRODUCTION

The incidence of acute pancreatitis ranges between 5 and 80 per 100,000 populations worldwide and United States have highest incidence followed by Finland.¹ Throughout the world prevalence of AP varies even from region to region within the country.² In Pakistan there is no consensus in epidemiology due lack of studies and data collection. The etiology and treatment outcomes of acute pancreatitis (AP) vary significantly among different countries due to obscure pathogenesis.³ Risk factor prevalence makes a contribution to the variability in incidence and etiology of diseases caused by geographic and demographic differences between

and within countries.⁴ There are some countries where alcohol-related pancreatitis is involved in a higher incidence of AP than those where gallstones gallstone is predominant etiology for AP.⁵ Incidence of AP increases with age and in male population.^{5,6}

According to the revised Atlanta classification system, chronic pancreatitis can be classified based on clinical, pathological, and computed tomographic (CT) manifestations. In the revised classification system, acute pancreatitis is defined as abdominal pain (typically epigastric in position and radiating to the back) and serum amylase or lipase levels that are three times above normal. An imaging study is not required if these findings are present.⁷ This disease can cause mild, moderate, or severe pancreatitis. Pancreatitis is generally self-limiting in mild cases, but severe cases can develop into local and systemic complications such as parenchymal/peripancreatic fluid collections, necrosis, and multiple organ failure lasting more than 48 hours, with a mortality rate that can reach 25%.^{7,8} Acute pancreatitis is a common cause of hospital admission in emergency department. In Pakistan very small data available regarding AP. Few studies are conducted on AP and they assessed the common etiology, severity and mortality.⁹⁻¹¹

Department of Hepatology Asian Institute of Medical Sciences, Hyderabad.

Correspondence: Dr. Adil Hassan, Assistant Professor Department of Hepatology, Asian Institute of Medical Sciences, Hyderabad.

Contact No: 03337159144

Email: dradilchang@gmail.com

Received: April, 2023

Accepted: June, 2023

Printed: September, 2023

MATERIALS AND METHODS

This study included all consecutive patients with acute pancreatitis over the age of 10 who presented.

Data was collected from 91 patients.

Patient diagnosed as carcinoma of pancreas, post ERCP pancreatitis or other malignancy was excluded. Acute pancreatitis was diagnosed as per standard definition by revised Atlanta classification. A blood sample was collected following informed consent for complete blood count, liver function tests, serum albumin, serum lipase and amylase, serum calcium, LDH, lipid profile, random blood sugar, serum creatinine, and urea measurements. Ultrasound abdomen was performed to see biliary system.

Statistical analysis: The collected data were transferred to SPSS Statistics software (SPSS: An IBM Company, version 20.0, IBM Corporation, Armonk, NY, USA). The data were Analyzed by the researcher mean and standard deviation were calculated for age, BMI, Bilirubin, hematocrit (HCT), urea and percentage were calculated for Gender, Obesity, Diabetes Mellitus, Alcohol and smoking. Ultrasound based GB stone, CBD dilatation and type of pancreatitis (interstitial and necrotic) were expressed in percentages. Outcomes (death of patient or improved and discharged) and etiologies were also calculated in percentages.

Stratification with respect to age, gender, DM, Alcohol, CBD stone, GB stone, Type of pancreatitis CBD dilatation and Ascites (Present/absent) were performed. Post stratification Chi square test applied. P-value of ≤ 0.05 was taken as significant.

RESULTS

A total of 91 patients were enrolled according to the inclusion and exclusion criteria during the study period. The Mean age of the study population was 40.22 \pm 15.657 years (range: 13–75 years) and majority were female 49(53.8%). There were 45(49.5%) patient with normal basal mass index (BMI) followed by 35(38.5%) patient was obese, 9(9.9%) were overweight and 2(2.1%) were underweight. 44(48.4%) were idiopathic while Gall stones was found in 33(36.3%) patients and alcoholism in 9(9.9%) patients. Pancreatic collection was the common complication in 12(13.2%) patients while 84(92.3%) with interstitial pancreatitis and 7(7.7%) developed necrotic pancreatitis. For biliary pancreatitis 25(27.5%) patients under went ERCP during admission. Systemic complication developed in 20(22%) patients with sepsis 7(7.7%) followed by AKI 5(5.5%), plural effusion + sepsis 4(4.4%), AKI + sepsis 3(3.3%), AKI +plural effusion + sepsis 1(1.1%) and 13(65%) recovered from systemic and local complication. Overall 84(92.3%) patients improved from pancreatitis (Table I).

Table No. 1: Baseline characteristics of the study population

Age; mean \pmS.D	40.22 \pm 15.657
Sex; n (%)	Male 42 (46.2%)
	Female 49 (53.8%)
BMI; mean \pmS.D	26.62 \pm 5.629
Normal BMI	45(49.5%)
Obese	35(38.5%)
Overweight	9(9.9%)
Underweight	2(2.1%)
Bilirubin; mean \pmS.D	2.516 \pm 3.1956
HCT; mean \pmS.D	40.99 \pm 45.77
HCT 24; mean \pmS.D	37.860 \pm 10.0526
Urea; mean \pmS.D	34.95 \pm 28.110
Urea 24; mean \pmS.D	26.11 \pm 30.07
DM; n (%)	19 (20.9%)
Alcohol; n (%)	9 (9.9%)
Smoking status; n (%)	Never Smoke 8 (8.8%)
	Past smoker 83 (91.2%)
U/S GB Stone; n (%)	29 (31.9%)
CBD dilatation; n (%)	26 (28.6%)
Necrotic Surrounding pancreases; n (%)	6 (6.6%)
Pancreatic collection; n (%)	12 (13.2%)
Type of pancreas; n (%)	Interstitial 84 (92.3%)
	Necrotic 7 (7.7%)
Ascites; n (%)	29 (31.9%)
ERCP done during current admission; n (%)	25 (27.5%)
Systemic Complication	20 (22%)
Sepsis	7 (7.7%)
AKI	5 (5.5%)
Sepsis + Plural Effusion	4 (4.4%)
Sepsis + AKI	3 (3.3%)
AKI + Plural Effusion + Sepsis	1 (1.1%)
Recoved from systemic complication	13 (65%)
Expired with systemic complication	7(35%)
Outcome; n (%)	Improved 84 (92.3%)
	Expired 7 (7.7%)
Final cause; n (%)	Unknown 44 (48.4%)
	Gall stone 33 (36.3%)
	Alcohol 9 (9.9%)
	Trauma 3 (3.3%)

According to a clinical examination or a CT scan, these cases were identified as acute pancreatitis. When risk factors and local complication were associate with outcome, the p-value < 0.02 was significant only for local complication while there was no significant association with any risk factors (Table 2).

Table No. 2: Association of risk factors and local complication with respect to outcome.

		Outcome		P-value
		Improved	Expired	
Sex	Male	39 (46.4%)	3 (42.9%)	0.86
	Female	45 (53.6%)	4 (57.1%)	
DM	Yes	17 (20.2%)	2 (28.6%)	0.60
	No	67 (79.8%)	5 (71.4%)	
Alcohol	Yes	7 (8.3%)	1 (14.3%)	0.59
	No	77 (91.7%)	6 (85.7%)	
Smoker(past/Present)	Never Smoke	7 (8.3%)	1 (14.3%)	0.59
	Past smoker	77 (91.7%)	6 (85.7%)	
U/S GB Stone	YES	27 (32.1%)	2 (28.6%)	0.85
	No	57 (67.9%)	5 (71.4%)	
CBD dilatation	Yes	25 (29.8%)	1 (14.3%)	0.38
	No	59 (70.2%)	6 (85.7%)	
Stone In CBD	YES	20 (23.8%)	1 (14.3%)	0.57
	No	64 (76.2%)	6 (85.7%)	
Peripancreatic collection	Present	4 (4.8%)	2 (28.6%)	0.02*
	Absent	80 (95.2%)	5 (71.4%)	
Type of pancreas	interstitial	80 (95.2%)	5 (71.4%)	0.02*
	necrotic	4 (4.8%)	2 (28.6%)	
Ascites	Yes	25 (29.8%)	4 (57.1%)	0.14
	No	59 (70.2%)	3 (42.9%)	

P-value < 0.05 will be considered as significant.

DM=Diabetes mellitus, U/S= Ultrasound, GB=Gall bladder, CBD= Common bile duct

Table No. 3: Length of hospital stay

Outcome	Value/Rate
Hospital Length of Stay	9.5 days
Readmission	12 (13.2%) within 30 days
Complications	25 (27.5%) during hospital stay
Mortality Rate	5 (5.5)%

DISCUSSION

Our study investigated the frequency, etiology, local complications, and associations with the outcomes (in-hospital mortality) among patients with acute pancreatitis in tertiary care hospitals. We found majority of patients with normal BMI, female gender, idiopathic etiology and interstitial pancreatitis.

This research reveals that idiopathic are the most common cause of acute pancreatitis (48.4%) and followed by gallstone (31.9%) and alcohol (9.9%) while other studies in Pakistan shows gallstone (74 %) main culprit followed by idiopathic (13%) and alcohol (2.6%).^{11,12} The higher prevalence of idiopathic pancreatitis is due to the fact that Magnetic Resonance Cholangiopancreatography (MRCP) was rarely performed at our facility as a result of lack of unavailability and unaffordability.¹³ Therefore, pancreaticobiliary anomalies, microlithiasis and sludge may have been missed in some patients.¹⁴

In this group majority were female 49(53.8%). There were 45(49.5%) patient with normal basal mass index (BMI) followed by 35(38.5%) patient was obese, 9(9.9%) were overweight and 2(2.2%) were

underweight. 44(48.4%) were idiopathic while Gall stones was found in 33(36.3%) patients and alcoholism in 9(9.9%) patients. Haider et al reported severe disease (organ failure) who account for about 20% of presentations and mortality is approximately 30% while in our study systemic complication developed 20(22%) with sepsis 7(7.7%), AKI 5(5.5%) or combined sepsis + plural effusion 4(4.4%), sepsis + AKI 3(3.3%), and sepsis + AKI + plural effusion 1(1.1%). Patients recovered from systemic complication were 13(65%). Peripancreatic collection was the common local complication in 12(13.2%) patients while 84(92.3%) with interstitial pancreatitis and 7(7.7%) developed necrotic pancreatitis. Out of 91 patients, 7(7.7%) expired (Table 1). When risk factors and local complication were associate with outcome, the p value < 0.02 was significant only for local complication while there was no significant association with risk factors (Table 2).

In our study group main etiology was idiopathic 44(48.4%) which could be mislabeled microlithiasis pancreatitis¹⁰. Smith et al¹⁵ researcher report that most patients with a cause idiopathic have microlithiasis or biliary sludge for which Endoscopic Ultrasound (EUS) is capable of providing the best diagnoses when compared to an MRCP or endoscopic retrograde cholangiopancreatography (ERCP).

In our data majority of patients were with acute pancreatitis and normal BMI and previous studies also shows that no linear relationship of mortality with obesity in acute pancreatitis even mortality is high in normal BMI than obese in AP.¹⁶ In our study group 92.3% are with interstitial pancreatitis while very low

prevalence 6.6% of necrotizing pancreatitis and when compare with other studies, most of the studies have 10-20% of frequency for NP while low frequency 7% in another study¹⁷

It is observed that course of disease process of AP no longer linked with etiology once pathogenic mechanism of disease started. The overall mortality in AP is 7(7.7%) out of which 5(71.4%) with interstitial pancreatitis and 2(28.6%) in necrotizing pancreatitis while guideline shows 5% mortality out of which 3% in interstitial and 17% necrotizing pancreatitis.¹⁸ However we hypothesized that this difference in mortality could be to small number of patient so need further local studies. The results of this report may be impacted by certain caveats. It was a single-center study and a small number of participants. The second problem is some patients did not undergo CT scans to determine if they had interstitial pancreatitis. The strengths of our study is prospective data collection.

CONCLUSION

The findings of this study indicate that more studies need to be undertaken to determine the obesity paradox and the relationship between risk factors and outcomes.

Author's Contribution:

Concept & Design of Study: Abdul Hafeez
 Drafting: Jawed Iqbal, Adil Hassan
 Data Analysis: Rehmatullah Bhatti,
 Bushra Kadir,
 Muhammad Sadik
 Revisiting Critically: Abdul Hafeez, Jawed
 Iqbal
 Final Approval of version: Abdul Hafeez

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Banks PA. Epidemiology, natural history, and predictors of disease outcome in acute and chronic pancreatitis. *Gastrointest Endosc* 2002;56(6B):a129022.
2. Abbasi AH, Abid S. Acute Pancreatitis; Prof Med J 2019;26(4). Available from: <http://theprofesional.com/index.php/tpmj/article/view/3373>
3. Bhatia M, Wong FL, Cao Y, Lau HY, Huang J, Puneet P, et al. Pathophysiology of acute pancreatitis. *Pancreatol* 2005;5(2-3):132-44.
4. Roberts SE, Morrison-Rees S, John A, Williams JG, Brown TH, Samuel DG. The incidence and aetiology of acute pancreatitis across Europe. *Pancreatol* 2017;17(2):155-65.
5. Yadav D, Lowenfels AB. Trends in the Epidemiology of the First Attack of Acute Pancreatitis. *Pancreas* 2006;33(4):323-30.
6. Toouli J, Brooke-Smith M, Bassi C, Carr-Locke D, Telford J, Freeny P, et al. Guidelines for the management of acute pancreatitis. *J Gastroenterol Hepatol* 2002;17:S15-39.
7. Gress TM, El-Omar EM. Revision of the Atlanta classification of acute pancreatitis: the editorial perspective. *Gut* 2013;62(1):1-1.
8. Mofidi R, Duff MD, Wigmore SJ, Madhavan KK, Garden OJ, Parks RW. Association between early systemic inflammatory response, severity of multiorgan dysfunction and death in acute pancreatitis. *Br J Surg* 2006;93(6):738-44.
9. Pal KM, Kasi PM, Tayyeb M, Mosharraf SMF, Fatmi Z. Correlates of Morbidity and Mortality in Severe Necrotizing Pancreatitis. *ISRN Surg* 2012;2012:1-5.
10. Shafique F, Khan MF, Ali MA, Shamim F, Sohaib M. Outcome of patients with acute pancreatitis requiring intensive care admission: A retrospective study from a tertiary care center of Pakistan. *Pak J Med Sci* 2018;34(5). Available from: <http://pjms.com.pk/index.php/pjms/article/view/15575>
11. Hameed T, AZK. Factors leading to acute pancreatitis in a tertiary care hospitals in Pakistan-A Multicenter Study 2018;22(1):50-53.
12. Ahmed R, Shafique MS, Ahmad SH, Hassan M, Adnan N, Rasheed G, et al. Spectrum of acute pancreatitis on surgical floor of tertiary care hospital. *Rawal Med J* 2016;7:31-5.
13. Johnson CD. UK guidelines for the management of acute pancreatitis. *Gut* 2005;54(SUPPL. 3):iii1-iii9.
14. DeWaele E, Op de Beeck B, DeWaele B, Delvaux G. Magnetic Resonance Cholangiopancreatography in the Preoperative Assessment of Patients with Biliary Pancreatitis. *Pancreatol* 2007;7(4):347-51.
15. Smith I, Ramesh J, Kyanam Kabir Baig KR, Mönkemüller K, Wilcox CM. Emerging Role of Endoscopic Ultrasound in the Diagnostic Evaluation of Idiopathic Pancreatitis. *Am J Med Sci* 2015;350(3):229-34.
16. Gupta R, Villa M, Agaba E, Ritter G, Sison C, Marini CP, et al. The Effect of Body Mass Index on the Outcome of Critically Ill Surgical Patients. *J Parenter Enter Nutr* 2013;37(3):368-74.
17. Pongprasobchai S, Vibhatavata P, Apisarnthanarak P. Severity, treatment, and outcome of acute pancreatitis in Thailand: the first comprehensive review using revised atlanta classification. *Gastroenterol Res Pract* 2017;2017:1-7.
18. Banks PA, Freeman ML. Practice Guidelines in Acute Pancreatitis. *Am J Gastroenterol* 2006; 101(10):2379-400.