

Original Research Article

Assessment of independent risk factors of acute pancreatitis

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ABSTRACT

Background: Acute pancreatitis (AP) is a sudden inflammatory condition of the pancreas. The present study recorded independent risk factors of acute pancreatitis.

Methods: The present study was conducted on 50 patients of acute pancreatitis of both genders. A detailed general and systemic examination was done in all patients. History of smoking, alcoholism, hypertension, weight, obesity and diabetes was taken.

Results: Out of 50 patients, males were 45 and females were 5. There was history of smoking in 20 patients, alcoholism in 15, weight >70 kg in 38, hypertension in 10, diabetes in 24 patients and obesity in 12 patients. The difference found to be significant ($p < 0.05$).

Conclusions: Authors found that smoking, alcoholism, hypertension, diabetes, weight >70 kg and obesity as independent risk factors of acute pancreatitis.

Keywords: Acute pancreatitis, Alcoholism, Hypertension

INTRODUCTION

Acute pancreatitis (AP) is a potentially life-threatening acute inflammatory disease of the pancreas.¹ It is characterized by a systemic inflammatory response, with a growing number of hospitalizations each year, and it is associated with a mortality ranging from 3% to 30% in the world.² In addition to gallstones and alcohol, hypertriglyceridemia (HTG) is considered the third most common etiology of AP and accounts for 1-12% of AP cases.³

It is reported that hypertriglyceridemia affects approximately one-quarter of the United States (US) population.⁴ It is reported that 12% to 38% of AP patients have a history of a lipid disturbance. According to the guidelines of the American college of Gastroenterology and the endocrine society, HTG levels (≥ 1000 mg/dl) should be considered as a risk factor for developing acute pancreatitis.⁵ Elevated serum triglycerides (TGs) have

been positively associated with the risk of AP, but the exact mechanism remains nebulous. As diabetes represents metabolic disorders, the endocrine function of the pancreas is affected, altering the carbohydrate and lipid metabolism.⁶

The diagnosis of AP involved a combination of symptoms, physical examination, and focused laboratory values, with 2 of the following 3 features: upper abdominal pain of acute onset often radiating through to the back, serum amylase or lipase activity greater than 3 times normal, and findings on cross-sectional abdominal imaging consistent with acute pancreatitis. Every patient in our study underwent pancreatic imaging. AP was divided into 3 degrees based on severity: mild, moderately severe, and severe acute pancreatitis, according to the Atlanta classification 2012 revision.⁷ The present study recorded independent risk factors of acute pancreatitis. The objective of the study was to assess the efficacy of various independent risk factors in predicting severity of AP.

METHODS

The present study was conducted in the department of surgical gastroenterology at a tertiary care center in Hyderabad, India from February 2017 to May 2018. It comprised of 50 patients of acute pancreatitis of both genders. Ethical clearance was obtained from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

Information related to patients such as name, age and gender was recorded. A detailed general and systemic examination was done in all patients. History of smoking, alcoholism, hypertension, weight, obesity and diabetes etc. was taken. Patients with pain in abdomen with serum amylase and /or lipase of more than/equal to three times the upper limit and ultrasound/computed tomography (CT) findings of AP were included in the study. Patients who presented more than 72 hours after the onset of symptoms were excluded from the study.

Final outcome of the patient in terms of severity of pancreatitis viz. mild pancreatitis or severe pancreatitis was the end point of the study against which all the variables were compared. The Atlanta consensus symposium definitions of mild and severe pancreatitis were used.

Results were tabulated and subjected to statistically analysis. The data was initially explored using descriptive statistics to derive the mean, median and range of continuous variables and the frequency distribution of categorical variables. Bivariate analysis was used to explore potential associations with severity of pancreatitis.

A p value less than 0.05 was considered significant. Clearance was obtained from the Institutional ethics committee.

RESULTS

Out of 50 patients, males were 45 and females were 5 (Table 1).

Table 1: Type of pancreatitis.

Gender	Male	Female
Number	45	5

There was history of smoking in 20 patients, alcoholism in 15, weight >70 kg in 38, hypertension in 10, diabetes in 24 patients and obesity in 12 patients. The difference found to be significant (p<0.05) (Table 2 and Figure 1).

Table 2: Assessment of independent risk factors.

Risk factors	Number	P value
Smoking		
Yes	20	0.05
No	30	
Alcoholism		
Yes	15	0.02
No	35	
Weight		
>70 Kg	38	0.01
<70 Kg	12	
Hypertension		
Yes	10	0.05
No	40	
Diabetes		
Yes	24	0.91
No	26	
Obesity		
Yes	12	0.01
No	38	

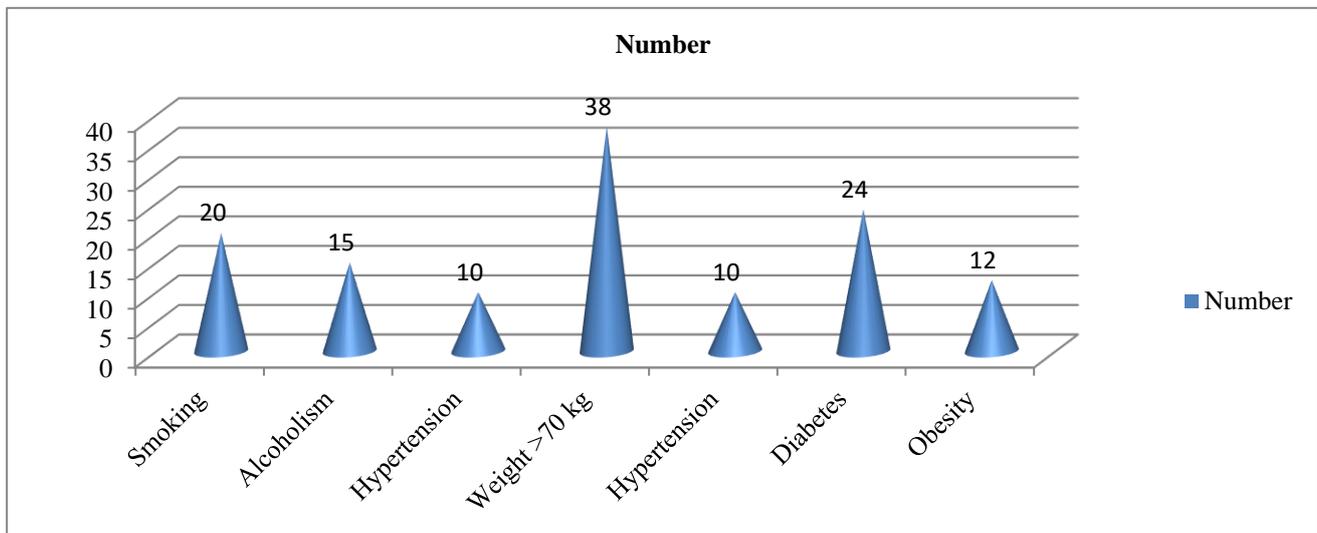


Figure 1: Assessment of independent risk factors.

DISCUSSION

Acute pancreatitis (AP) is a sudden inflammatory condition of the pancreas.⁸ Although conservative management results in clinical improvement in most patients, approximately 5% to 10% of cases progress to life-threatening conditions, including multiorgan failure, with significant morbidity and mortality.⁹ The present study recorded independent risk factors of acute pancreatitis.

In our study out of 50 patients, males were 45 and females were 5. Li et al identified severe hypertriglyceridemia patients without AP (HNAP) and with HIAP with a fasting triglyceride level of >1000 mg/dl in 124 patients with severe hypertriglyceridemia, 62 patients were in the HIAP group and 62 were in the HNAP group.¹⁰ There was no gender difference in both groups; however, there were more younger patients in the HIAP group than in the HNAP group and the HIAP group had low level of high-density lipoprotein compared to the HNAP group. The presence of pancreatitis was associated with higher level of glycemia and a history of diabetes ($P<0.05$). Multivariate logistic regression analysis indicated that a history of diabetes and younger age were independent risk factors for acute pancreatitis in patients with severe hypertriglyceridemia. Uncontrolled diabetes and younger age are potential risk factors in patients with severe hypertriglyceridemia to develop acute pancreatitis. We found that there was history of smoking in 20 patients, alcoholism in 15, weight >70 kg in 38, hypertension in 10, diabetes in 24 patients and obesity in 12 patients.

Smoking emerged as an independent factor associated with AP. Several experimental animal studies have suggested that exposure to smoking can induce pathologic and functional changes in the pancreas that can cause inflammatory activity.¹²⁻¹⁴ Smoking can also elevate the level of pancreatic zymogens in the blood stream after secretin stimulation.¹⁵ In multivariate analysis, we found that smoking was an independent factor associated with SAP in both alcohol- and gallstone-induced AP.

Alcohol was the most common etiology in our study, while gall stone disease was the common etiology in other studies. With the wide availability of endoscopic retrograde cholangiopancreatography (ERCP), many of the biliary pancreatitis patients are managed by the medical gastroenterologists, which were not considered in this study. Also, quite a number of mild pancreatitis cases are treated at district hospitals. This probably explains the preponderance of alcoholic over biliary pancreatitis in our study.

Garg et al found a very high incidence of biliary pancreatitis in their study which is understandable as North India is a belt for gall stone disease.¹⁶ Setiawan et al conducted a prospective analysis of 145,886 participants in the multiethnic cohort to examine the relationship of alcohol drinking and smoking with pancreatitis.¹⁷ Previous

studies have shown that in patients with alcohol induced AP, the frequency of pseudocyst formation or peripancreatic fluid aggregation was higher compared with gallstone induced AP. In heavy alcoholics who have already experienced underlying pancreatic damage at the time of AP diagnosis alcohol-induced AP usually develops.

Obesity was not seen to be a good predictor of severity in our study. Some authors have reported obesity to be a good predictor of severity and mortality. Martinez et al have published two meta-analysis on this and the recent one in 2006, which included 5 studies showed obesity to be a good predictor for severity and also mortality with an increased OR (OR 2.9, 95% CI 1.8–4.6) as compared to the previous meta-analysis in 2004.¹⁸ The above difference could be due to the smaller number of obese patients in our study (22%), as the prevalence of obesity in India is less compared to the western countries where nearly 55-57% of patients are obese. In one of the Asian study, Tsai et al showed that obesity did not confer an increased risk of organ failure or mortality in AP.¹⁹

Mentula et al in their recent analysis found little effect of body mass index (BMI) on early inflammatory response in AP.²⁰ Rau in his review concluded that obesity on its own does not constitute a major outcome determinant.¹⁵

Jin et al included 602 patients (256 men and 346 women), 74 patients (12.3%) developed moderately severe AP (MSAP) or severe AP (SAP).²¹ There were 5 significant differences between patients who developed MSAP or SAP and those who did not: volatile fatty acid-VFA (>100 cm²), BMI (25 kg/m²), Ranson score, acute physiology and chronic health evaluation-APACHE-II (5), and blood glucose level on admission (>11.1 mmol/l). Further multivariate logistic regression analyses revealed that BMI (25 kg/m²), APACHE-II (5) ($p=0.001$), and blood glucose level on admission (>11.1 mmol/l) ($p=0.004$) were independent risk factors for developing MSAP or SAP in patients admitted with MAP. Moreover, patients who developed MSAP or SAP had a mortality rate of 5.4%.

Kim et al included 905 patients with AP of which severe AP (SAP) occurred in 72 patients (53 alcohol-induced, 19 gallstone-induced).²² Current smoking, pancreatic necrosis, and bacteremia were associated with AP severity in both alcohol- and gallstone-induced AP. Pancreatic fluid collection was significantly associated with alcohol-induced SAP, whereas dyslipidemia was significantly associated with gallstone-induced SAP. Body mass index was significantly correlated with the bedside index of severity in acute pancreatitis (BISAP) score in both alcohol- and gallstone-induced AP. Current smoking, pancreatic necrosis, and bacteremia can aggravate the clinical course of AP. Pancreatic fluid collection and dyslipidemia were associated with AP severity according to the different etiologies. Obesity may also be associated with AP severity in both etiologies. The shortcoming of this study is small sample size.

CONCLUSION

Authors found that smoking, alcoholism, hypertension, diabetes, weight >70 kg and obesity as independent risk factors of acute pancreatitis. Males a higher number of cigarettes smoked daily seems to be a distinct risk factor in pancreatitis.

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