

# Assessment of Risk Factor Associated with Pancreatitis: A Hospital Based Study

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## ABSTRACT

**Background:** Pancreatitis, an inflammatory condition leading to pancreatic tissue damage, causes substantial morbidity and mortality. Pancreatitis develops when digestive enzymes produced by the exocrine pancreas become activated in the pancreas instead of the small intestine, causing inflammation and tissue damage in the pancreas. Understanding the etiology of pancreatitis is paramount to prevent this disease.

**Aim of the study:** To assess the risk factors associated with pancreatitis.

**Materials and Methods:** The study was conducted in the Department of General Surgery, Government Hospital, Dungarpur, Rajasthan, India. For the study we selected subjects aged between 21-70 years from the medical records of the hospital with the diagnosis of pancreatitis. Subjects were recalled to complete a baseline and five follow-up questionnaires addressing demographics, anthropometrics, lifestyle, medical history, hormone replacement therapy (HRT), diet, physical activity and other factors. The physicians categorized patients as definite, probable or uncertain pancreatitis. A total of 150 subjects were included in the study.

**Results:** A total of 150 patients were included in the study. The mean age of the subjects was 52.13 years. 43 patients smoked

cigarettes at the time of admission to the hospital and 71 patients consumed alcohol at the time of admission. We observed statistically significant relation of smoking, alcohol consumption and aspirin use >6 times/week.

**Conclusion:** The smoking, alcohol consumption and taking aspirin >6times per week are potential risk factors associated with pancreatitis.

**Keywords:** Pancreatitis, Acute, Chronic, Smoking.

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## INTRODUCTION

Pancreatitis, an inflammatory condition leading to pancreatic tissue damage, causes substantial morbidity and mortality.<sup>1</sup> Pancreatitis develops when digestive enzymes produced by the exocrine pancreas become activated in the pancreas instead of the small intestine, causing inflammation and tissue damage in the pancreas. Pancreatitis can be acute (AP), with sudden onset and usually resolving within several of days, or chronic (CP), occurring over many years. Recurrent AP (RAP), mostly non-gallstone related, can progress to chronic pancreatitis (CP) characterized by progressive pancreatic inflammation and scarring, irreversible morphologic changes, and resulting in loss of exocrine and endocrine function.<sup>2,3</sup> CP, while lower in incidence, is a serious condition which can severely impact quality of life and lead to serious long-term complications including diabetes and pancreatic cancer. Currently there is no available treatment for pancreatitis and no therapy to prevent recurrent episodes for non-gallstone related pancreatitis.<sup>4</sup> Understanding the etiology of pancreatitis is paramount to prevent this disease. Cigarette smoking and heavy alcohol drinking ( $\geq 4$  drinks per day) have been associated with

risk of pancreatitis; since alcohol and smoking are often linked behaviors, there remain questions about the independent influence of alcohol.<sup>5,6</sup> Hence, we planned the study to assess the risk factors associated with pancreatitis.

## MATERIALS AND METHODS

The study was conducted in the Department of General Surgery, Government Hospital, Dungarpur, Rajasthan, India. The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. For the study we selected subjects aged between 21-70 years from the medical records of the hospital with the diagnosis of pancreatitis. Subjects were recalled to complete a baseline and five follow-up questionnaires addressing demographics, medical history, and other factors. The physicians categorized patients as definite, probable or uncertain pancreatitis. We excluded "uncertain" cases, i.e. cases with insufficient data to confirm pancreatitis. A total of 150 subjects were included in the study. Pancreatitis cases were categorized as AP, if patients had one acute pancreatitis episode

and CP, if patients had  $\geq 2$  episodes of acute pancreatitis that were at least 6 weeks apart or one episode of chronic pancreatitis. We assessed the patients calculating the relation of AP and CP to BMI, smoking (status and pack-years), heart disease or attack, diabetes, alcohol use, and aspirin use.

The statistical analysis of the data was done using SPSS version 20.0 for windows. The Student's t-test and Chi-square test were used to check the significance of the data. The p-value less than 0.05 were predetermined as statistically significant.

**Table 1: Parameters of the patients at the time of admission**

Parameters	Study group (n=150)	p-value
Mean age (years)	52.13	0.12
<b>Smoking status</b>		
• Yes	43	
• No	107	
<b>Alcohol consumption status</b>	71	
• Yes	79	
• No		
Mean BMI (kg/m <sup>2</sup> )	29.21	

**Table 2: Risk factors and relation to acute and chronic pancreatitis**

Parameters	Acute pancreatitis (n=89)	Chronic pancreatitis (n=61)	p-value
<b>Smoking status</b>			0.002
• Yes	42	28	
• No	47	33	
<b>Alcohol consumption</b>			0.01
• Yes	56	30	
• No	33	31	
<b>Heart disease</b>			0.23
• Yes	21	18	
• No	68	43	
<b>Diabetes</b>			0.23
• Yes	29	19	
• No	60	44	
<b>Aspirin use (&gt;6 times/week)</b>			0.03
• Yes	41	33	
• No	48	28	

## RESULTS

We conducted the study to assess the risk factors associated with pancreatitis. A total of 150 patients were included in the study. Table 1 shows the parameters of the patients at the time of admission. The mean age of the subjects was 52.13 years. 43 patients smoked cigarettes at the time of admission to the hospital and 71 patients consumed alcohol at the time of admission. Table 2 shows risk factors and relation to acute and chronic pancreatitis. We observed statistically significant relation of smoking, alcohol consumption and aspirin use >6 times/week.

## DISCUSSION

AP has an overall low mortality, of approximately 1%. The risk of death increases with age, co-morbidities, and severe disease; in a recent meta-analysis, the risk of death was the highest among patients with both organ failure and infected necrosis. Proportional mortality has decreased over time, likely from better intensive and supportive care, clarity on optimal timing of interventions for complications (surgery, endoscopic, or percutaneous drainage), and increased detection of milder cases. Although data are limited, the population mortality has not decreased.<sup>7</sup> Patients with CP have shorter survival times than the population, but most die from non-pancreatic causes, such as other chronic diseases, cancers, or infections. Mortality is high among patients with pancreatic cancer.<sup>8</sup>

In the present study we assessed risk factors associated with pancreatitis. We observed statistically significant relation of smoking, alcohol consumption and aspirin use >6 times/week. The results were statistically significant. The results were compared with previous studies and results were consistent with previous studies. Munigala S et al evaluated the influence of cigarette smoking on AP risk and clinical presentation in a large cohort of Veteran's Administration (VA) patients. Retrospective study of VA patients from 1998 to 2007. Exclusion criteria included (1) history of chronic pancreatitis (n = 3222) or gallstones (n = 14,574) and (2) age younger than 15 years (n = 270). A 2-year washout period was used to exclude patients with pre-existing recurrent AP. The study included 484,624 patients. From 2001 to 2007, a total of 6799 (1.4%) patients had AP. Alcohol (risk ratio, 4.20) and smoking (risk ratio, 1.78) were independent significant risk factors of AP on multiple regression analysis. Smoking increased the risk of AP in both nonalcoholics (0.57% vs 1.1%) and alcoholics (2.6% vs 4.1%). Smoking was associated with younger mean age at first episode of AP and higher likelihood of recurrent AP ( $\geq 4$  episodes) in both nonalcoholics and alcoholics. The interval between recurrent episodes was not altered by alcohol or smoking. It was concluded that in a large cohort of VA patients, smoking is an independent risk factor for AP and augmented the effect of alcohol on the risk, age of onset, and recurrence of AP.

Ma MH et al characterized cases of pediatric biliary pancreatitis, compared biliary with non-biliary cases, examined differences in presentation between younger and older children, and studied features distinguishing gallstone- from sludge-induced pancreatitis. We evaluated 76 episodes of biliary pancreatitis from 271 cases of acute pancreatitis in children admitted to a tertiary care hospital from 1994 to 2007. Of the 76 cases, 55% had gallstones, 21% had sludge, and 24% had structural defects. Hispanic children had a 2.85 and 5.59 higher probability for biliary pancreatitis than white and black children, respectively. Median serum amylase and lipase in children with biliary pancreatitis were 64% and 49% higher, respectively, compared to other etiologies. In multiple logistic regression, aspartate aminotransferase (AST) was an independent predictor of biliary pancreatitis. When comparing gallstone- with sludge-induced etiologies, obesity was an independent predictor of gallstone cases.

They concluded that hispanic ethnicity is a risk factor and AST is a biomarker for biliary pancreatitis over other etiologies. Furthermore, obesity can distinguish gallstone- from sludge-induced pancreatitis.<sup>9,10</sup>

Setiawan VW 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. Pancreatitis cases were categorized as gallstone-related acute pancreatitis (GSAP) (N = 1,065), non-GSAP (N = 1,222), and recurrent acute (RAP)/chronic pancreatitis (CP) (N = 523). We used the baseline questionnaire to identify alcohol intake and smoking history. Associations were estimated by hazard ratios (HRs) and 95% confidence intervals (CIs) using Cox models. Cigarette smoking was associated with non-GSAP and RAP/CP. Moderate alcohol intake was inversely associated with all types of pancreatitis in women (HRs, 0.66 to 0.81 for <1 drink per day), and with RAP/CP in men. The risk of non-GS pancreatitis associated with current smoking was highest among men who consumed more than 4 drinks per day, whereas among never smokers, moderate drinking was associated with a reduced risk. In women, drinking less than 2 drinks per day was associated with a reduced risk of GSAP among never smokers. It was concluded that smoking is a risk factor for non-GS pancreatitis. Moderate alcohol intake is protective against all types of pancreatitis in women and against RAP/CP in men. Prizment AE et al assessed risk factors for acute (AP) and chronic pancreatitis (CP) in a prospective cohort (n=36,436 women, aged  $\geq 65$  years). Exposures were self-reported at baseline. Pancreatitis was ascertained by linkage to Medicare claims (1986–2004) categorized by a physician as: "AP", 1 AP episode (n=511); or "CP", 2+ AP or 1+ CP episodes (n=149). Multivariable odds ratios (OR) and 95% CI for AP and CP were calculated using multinomial logistic regression. Alcohol use was not associated with AP or CP. Heavy smoking (40+ versus 0 pack-years) was associated with a 2-fold increased OR for CP. For BMI  $\geq 30$  versus  $< 25$  kg/m<sup>2</sup>, the ORs were 1.35 (1.07–1.70) for AP and 0.59 (0.37–0.94) for CP (p-trend=0.01). ORs for AP and CP were increased for HRT use, heart disease, and hypertension. There were positive significant associations between protein and total fat intake for CP and AP. They identified factors associated with AP and CP that may be specific to older women.<sup>11,12</sup>

## CONCLUSION

Within the limitations of the study we conclude that the smoking, alcohol consumption and taking aspirin >6times per week are potential risk factors associated with pancreatitis.

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