

## Research Article

# A case control study of possible additional risk factors for chronic alcoholic pancreatitis

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### ABSTRACT

**Background:** Chronic pancreatitis (CP) is characterised by irreversible damage to pancreas leading to endocrine and exocrine insufficiency with considerable morbidity. Etiopathogenesis is multifactorial with interplay between genetics & environmental toxins. Alcoholism is more commonly associated with chronic pancreatitis. But it is not very clear why only certain proportion of the alcoholics develop pancreatitis. So this study was conducted to find the possible additional risk factors involved in alcoholic pancreatitis.

**Methods:** A total of 30 patients with alcoholic pancreatitis from a tertiary care hospital in Pondicherry, India were enrolled and compared with age matched alcoholics without pancreatitis. The diagnostic criteria for alcoholism were based on diagnostic and statistical manual of mental disorders (DSM) criteria IV of alcohol consumption >80gms/day for a period of 5 years or more and chronic pancreatitis was based on significant clinical findings and positive ultrasound findings of pancreatitis. Questions regarding additional risk factors of pancreatitis like smoking, blood group and Diabetes mellitus were asked and recorded using the standard questionnaire.

**Results:** Smoking history was noted in 73% of cases and 63.4% of controls. Non O blood group was noted in 56.6% of cases and 46.6% of controls. 10% of cases and 6.6% of controls gave history of diabetes before the development of pancreatitis. The additional risk factors were almost similar in both the groups and there was no statistical difference.

**Conclusions:** It was concluded that there is no statistically significant additional risk factors for chronic alcoholic pancreatitis noted in present study and a study with a large sample size for an extended period is recommended.

**Keywords:** Pancreatitis, Chronic, Alcoholic, Risk factors

### INTRODUCTION

Chronic pancreatitis (CP) is a long-term progressive inflammatory disease of the pancreas that leads to permanent deterioration of the structure and function of the pancreas and its prevalence was found to be very high in southern India (114-200/100 000 population).<sup>1</sup>

Recent studies reveal that the frequency of classical tropical chronic pancreatitis is decreasing and pancreatitis due to alcohol and other environmental toxins is on the rise.<sup>2</sup> It is not very clear why some alcoholics get pancreatitis and others not. Some additional risk factors

have been proposed in various studies as additive factors for alcoholic pancreatitis. Potential cofactors that have been proposed include smoking, high consumption of spicy food, caffeine and Cassava.<sup>3,4</sup>

It has also been proposed that Pancreatitis is also commonly seen in Non-O blood group persons and Diabetics.<sup>5,6</sup> As a result, it is quite necessary to understand the additional risk factors associated with alcoholic pancreatitis. There are only few descriptive studies conducted on this topic in Indian population and exact association between pancreatitis and various other proposed risk factors has not been proven. This study has

been conducted to find the possible additional risk factors like smoking, blood group and diabetes involved in alcoholic pancreatitis.

## METHODS

It was a Hospital based Case Control study conducted in a tertiary care teaching hospital in Urban Pondicherry, India. A list of all alcoholic pancreatitis patients admitted in the tertiary care centre in the last 2 years was made using hospital medical records. Thirty Patients diagnosed with alcoholic pancreatitis with the following standard diagnostic criteria were included for the study.

### Diagnostic criteria

- Alcoholics based on DSM (*Diagnostic and Statistical Manual of Mental Disorders*) criteria IV for alcohol abuse and alcohol consumption >80gms/day for a period of 5years or more.
- Clinical findings- history of upper abdominal pain radiating to back.
- Positive ultrasound findings- Pancreatic atrophy, Pseudocyst, Calcifications and Ductal dilatation.

Patients with pancreatitis due to gall stones and other non-alcoholic causes were excluded. Age group matched alcoholics without pancreatitis were taken as control group. Questions regarding additional risk factors of pancreatitis like smoking, blood group and diabetes were

asked and recorded using the questionnaire. Presence of diabetes before the development of chronic pancreatitis was asked. Ultrasound findings were recorded from the patient's hospital records. Simultaneously, age group matched controls were identified and interviewed like that of the cases. Smoking index is calculated and amount of alcohol intake is represented by grams of ethanol consumed per day. The analysis was done using SPSS version 17 and Open Epi Version 2.3 software.

## RESULTS

All the study participants were male with mean age of 39±9 years. Their mean duration of chronic pancreatitis is 16 months. Most of the patients had around two acute attacks of pancreatitis (Figure 1).

**Table 1: Mean duration and amount of alcohol consumption (N=30 in each group).**

Case, mean (sd)	Control, mean (sd)	P value
13.50 (7.94) years	10.70 (6.48) years	0.097
136.03 (83.2) gms	138.7 (76.5) gms	

Mean amount of ethanol consumed per day is 136.03gm for cases and 138.7 gm for controls and mean duration of alcohol consumption was 13.5yrs for cases and 10.7 years for controls and the difference is not statistically significant (Table 1).

**Table 2: Assessment of smoking as a risk factor for chronic pancreatitis (N=30 in each group).**

Smoking habit	Case	Control	Total	Chi square
Smokers	22 (73%)	19 (63.4%)	41	0.3081
Non-smokers	8 (27%)	11 (36.6%)	19	P value
Total	30 (100%)	30 (100%)	60	0.5789

**Table 3: Assessment of non-O blood group as a risk for chronic pancreatitis (N=30 in each group).**

Blood group	Cases	Controls	Total	Chi square
Non – O	17 (56.6%)	14 (46.6%)	31	0.267
O	13 (43.4%)	16 (53.4%)	29	P value
Total	30 (100%)	30 (100%)	60	0.6054

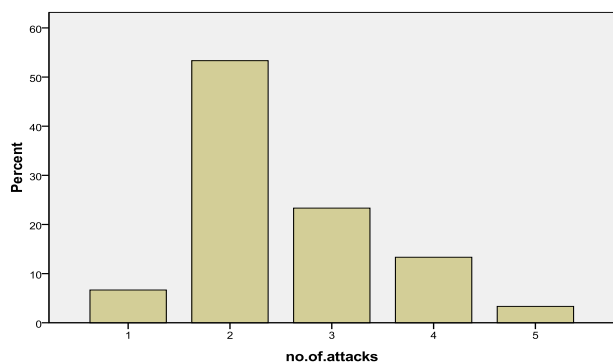
**Table 4: Assessment of diabetes mellitus as a risk for chronic pancreatitis (N=30 in each group).**

Diabetes	Cases	Controls	Total	P value
Present	3 (10%)	2 (6.6%)	5	0.6766
Absent	27 (90%)	28 (93.4%)	55	
Total	30 (100%)	30 (100%)	60	

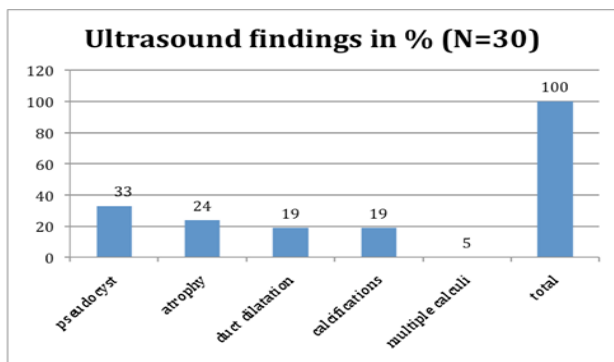
Smoking history was noted in 73% of cases and 63.4% of controls and it was not statistically significant (Table 2). Non O blood group is noted in 56.6% of cases and 46.6%

of controls and the difference is not statistically significant (Table 3). 10% of cases and 6.6% of controls gave history of diabetes before the development of pancreatitis and there is no significant difference (Table

4). Assessment of additional risk factors showed no significant difference between the cases and controls. Ultrasound imaging of chronic pancreatitis patients showed pseudocyst, parenchymal atrophy, ductal dilatation and calcifications (Figure 2).



**Figure 1: Frequency of acute attacks in chronic pancreatitis cases represented as percentage (N=30).**



**Figure 2: Ultrasound findings in cases of chronic pancreatitis (N=30).**

## DISCUSSION

According to literature, the prevalence of chronic pancreatitis is high in India compared to western population. The common causative factor in South India is alcoholism.

Various other additional cofactors have been proposed in other studies. Some of them are diet high in fat and protein, High consumption of spicy food, caffeine and Cassava and smoking. It has also been proposed that Pancreatitis is also commonly seen in Non-O blood group persons. Diabetes is also proposed to be a risk factor for developing chronic pancreatitis.

A cohort study was done on smoking, coffee intake and pancreatitis by Morton C et al in USA with a sample size of 439. They found that smoking was strongly related to increased risk of alcoholic pancreatitis. The relative risk of getting alcoholic pancreatitis among smokers when compared to non-smokers is 4.9 ( $p < 0.001$ ).<sup>7</sup> Lee et al studied the effects of cigarette smoke components on

Pancreatic stellate cells and found that in alcoholics who smoke, progression of pancreatic fibrosis may be facilitated by the combined effects of alcohol and cigarette smoke components.<sup>8</sup> Lin et al performed a population based cohort study in taiwan and found that smoking was not associated with pancreatitis.<sup>9</sup> Maire F et al conducted a study on autoimmune pancreatitis and found that high tobacco intake is associated with the risk of pancreatic damage and the occurrence of diabetes.<sup>10</sup>

Rebours V et al found that tobacco intake accelerates the course of alcoholic pancreatitis in patients who smoke more than 20 pack years.<sup>11</sup>

In our study, Smoking history was elicited in 73% of cases ( $n=22$ ) and 63.4% of controls ( $n=19$ ). Smoking index among cases and controls is 22.5 pack years and 19.2 pack years respectively ( $P$  value – 0.384). But a statistical significance could not be established due to small sample size and frequent association of cigarette smoking & alcohol consumption among alcoholics.

Weiss FU et al in a population based study on 3966 german volunteers found that blood group O was less frequently affected by chronic pancreatitis and blood group B has high risk of developing chronic pancreatitis.<sup>12</sup> In a Korean study by Sang myung woo, et al on risk of pancreatic cancer in relation to ABO blood groups, 753 patients with pancreatic cancer and 3,012 healthy controls, matched in a ratio of 4 to 1 with cancer patients for age and sex, between 2001 and 2011, at the National Cancer Center, Korea.

The adjusted Odds ratio for pancreatic cancer in subjects with non-O blood types was 1.29 (95% CI, 1.05-1.58;  $P = 0.01$ ) proving significant association between non-O blood groups and pancreatic adenocarcinoma.<sup>13</sup> Based on this hypothesis, Julia B Greer et al from pittsburgh, USA conducted a cohort study to find whether non-O blood groups are a risk for chronic pancreatitis. O blood group was non-significantly more common among cases with alcohol-related chronic pancreatitis (49.3% vs. 42%,  $P=0.060$ ).<sup>5</sup> In present study 56.6% of cases, 46.6% of controls are non-O blood groups and there is no statistical significance.

In a study done by Noel RA, et al risk of pancreatitis found to be high among type 2 diabetes patients compared to non-diabetics.<sup>6</sup> Only 10% (3) of cases, 6.6% (2) of controls are diabetics in our study which is not statistically different.

## CONCLUSION

In conclusion, there are no statistically significant additional risk factors for chronic alcoholic pancreatitis noted in our study. We recommend conducting the study with a large sample size for an extended period to find any association between smoking, ABO blood groups, diabetes and chronic alcoholic pancreatitis.

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## REFERENCES

1. Garg PK, Tandon RK. Survey on chronic pancreatitis in the Asia-Pacific region. *J Gastroenterol Hepatol.* 2004;19:998-1004.
2. Balakrishnan V, Unnikrishnan AG, Thomas V, Choudhuri G, Veeraraju P, Singh SP, et.al. Chronic Pancreatitis. A Prospective Nationwide Study of 1,086 Subjects from India. *J Pancreas.* 2008;9(5):593-600.
3. Rajesh G, Balakrishnan V. Chronic pancreatitis: South Indian Perspective. *Medicine Update.* 2012;8(6):445-50.
4. Yadav D, Hawes RH, Brand RE, Anderson MA, Money ME, Banks PA, et al. Alcohol consumption, cigarette smoking and the risk of recurrent acute and chronic pancreatitis. *Arch Intern Med.* 2009;169(11):1035-45.
5. Julia GB, Jessica R, Brand RF, O'Connell MR, Yadav D, Whitcomb DC. ABO Blood Group and Chronic Pancreatitis Risk in the NAPS2 Cohort. 2011;40(8):1188-94.
6. Noel R, Braun DK, Patterson RE, Bloomgren GI. Increased risk of acute pancreatitis and biliary disease observed in patients with type 2 diabetes: A retrospective cohort study. *Diabetes care.* 2009;32(5):834-8.
7. Morton C, Klatsky AL, Udaltsova N. Smoking, coffee and pancreatitis. *Am J Gastroenterol.* 2004;99(4):731-8.
8. Lee AT, Xu Z, Pothula SP, Patel MB, Pirola RC, Wilson JS, et al. Alcohol and Cigarette Smoke Components Activate Human Pancreatic Stellate Cells: Implications for the Progression of Chronic Pancreatitis. *Alcohol Clin Exp Res.* 2015;39(11):2123-33.
9. Lin HH, Chang HY, Chiang YT, Wu MS, Lin JT, Liao WC. Smoking, drinking, and pancreatitis: a population-based cohort study in Taiwan. *Pancreas.* 2014;43(7):1117-22.
10. Maire F, Rebours V, Vullierme MP, Couvelard A, Lévy P, Hentic O, et al. Does tobacco influence the natural history of autoimmune pancreatitis? *Pancreatol.* 2014;14(4):284-8.
11. Rebours V, Vullierme MP, Hentic O, Maire F, Hammel P, Ruszniewski P, et al. Smoking and the course of recurrent acute and chronic alcoholic pancreatitis: a dose-dependent relationship. *Pancreas.* 2012;41(8):1219-24.
12. Weiss FU, Schurmann C, Guenther A, Ernst F, Teumer A, Mayerle J, et al. Fucosyl-transferase 2 (FUT2) non-secretor status and blood group B are associated with elevated serum lipase activity in asymptomatic subjects, and an increased risk for chronic pancreatitis: a genetic association study. *Gut.* 2015;64(4):646-56.
13. Woo SM, Joo J, Lee WJ, Park S, Han S, Kim TH, Koh YH, et al. Risk of pancreatic cancer in relation to ABO blood group and hepatitis C virus infection in Korea: A case control study. *J Korean Med Sci.* 2013;28:247-51.

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