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Clinical Profile of Acute and Chronic Pancreatitis Cases among Alcoholics and Non-alcoholics: A Record Based Retrospective Observational Study

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Abstract

Background: The magnitude of acute and chronic pancreatitis is increasing with rising rates of alcohol consumption. **Aim and objective:** The aim of the study was to describe the effect of alcoholism in the pathogenesis of acute and chronic pancreatitis cases as well as to assess the clinical presentations and investigational findings of these cases. **Methods:** This observational retrospective study with cross sectional design was conducted based on records of the patients admitted with acute and chronic pancreatitis between October 2022 and October 2024 at Bankura Sammilani Medical College and Hospital. **Results:** Out of 348 patients, 120 had Acute Pancreatitis (alcoholic: 44; non-alcoholic: 76) and 228 had Chronic Pancreatitis (alcoholic: 172; non-alcoholic: 56). Among both types of pancreatitis cases mean age and mean bilirubin was higher among alcoholics with comparison to non-alcoholics but the mean ESR, lipase, amylase, ALP levels were higher among non-alcoholics. All the cases of acute pancreatitis presented with abdominal pain and 90.9% of those with alcoholism presented with vomiting. 95.3% alcoholic and all non-alcoholic patients with chronic pancreatitis presented with abdominal pain. While 71.4% alcoholic and 48.8% non-alcoholic with chronic pancreatitis presented with vomiting. The commonest aetiologies of acute pancreatitis were: gallstone (43.33%), alcohol (30%), idiopathic (26.66%) whereas those of chronic pancreatitis were: alcohol (71.92%), idiopathic (24.56%), gallstone (3.5%). The most common radiological features of chronic pancreatitis were pancreatic calcification and pseudocyst. **Conclusion:** Biochemical and haematological parameters were more elevated in patients suffering from acute and chronic pancreatitis with non-alcoholism compared to those with alcoholism.

Keywords: Acute Pancreatitis, Chronic Pancreatitis, Alcoholics, Non-alcoholics

1 Introduction

Acute pancreatitis characterized by reversible pancreatic parenchymal injury and inflammation and chronic pancreatitis defined as prolonged inflammation of the pancreas associated with irreversible destruction of exocrine

parenchyma, fibrosis and in late stages, loss of endocrine parenchyma¹. Most common etiologies of Acute Pancreatitis (AP) in India are Gallstone (35%-40%), Alcohol consumption (20%-25%), Hypertriglyceridemia (10%-15%), idiopathic (10%-15%) and other minor causes (10%)^{2, 3} whereas Gallstone

(35%-40%)⁴ and Alcohol abuse(20-25%)² are the two major causative factors worldwide. Most common etiology of Chronic Pancreatitis (CP) in India are Alcoholism (50%-60%), Tropical Calcific Pancreatitis (20%-25%), idiopathic (10%15%), gallstone (5%-10%), genetic and familial (2%-5%)^{2, 3} and alcohol is the major cause (65%-70%)^{5, 6} followed by idiopathic causes (20%-25%)^{7, 8} worldwide. Prevalence of chronic alcoholism in India is quite high. About 14.6% of male population and 1.8% of female population are heavy drinkers (≥ 4 drinks/day)⁹. Worldwide prevalence of alcohol abuse is close to 5% with varying figures in different countries¹⁰. This study seeks to investigate the potential link between alcohol consumption and its effect on acute and chronic pancreatitis in different age groups in our local setup. The researchers want to pinpoint if increased incidence of alcohol consumption is associated with pancreatic inflammation.

Objective

- To describe the effect of alcoholism in the pathogenesis of acute and chronic pancreatitis cases
- To assess the clinical presentations and investigational findings of acute and chronic pancreatitis cases

2 Materials and Methods

This observational retrospective study with cross sectional design was conducted based on available medical records of patients admitted with acute or chronic pancreatitis between October 2022 and October 2024 in the Surgery as well as Medicine Department of Bankura Sammilani Medical College and Hospital, Bankura. Records of all the patients admitted with clinical diagnosis of acute and chronic pancreatitis were included as study subjects while records with incomplete serum lipase and serum amylase level values were excluded. A total of 348 cases were thus obtained from the records using complete enumeration method. Socio-demographic variables like age, gender; independent variables like presenting symptoms such as abdominal pain, vomiting, investigational (amylase, lipase, ESR, bilirubin etc.) findings were included in the case information schedule used as a tool for data collection using which records were reviewed. Ethical clearance (BSMC/IEC/4117, dated 20.11.2024) was obtained from Institutional Ethics Committee and necessary permissions from the concerned authority were sought before reviewing the records. After collection data were entered into MS excel sheet and those were checked twice to detect any erroneous entry. After organising and presenting the data in the forms of tables and diagrams they were analysed applying the principles of descriptive statistics. SPSS version 23 was used to analyse the data. Appropriate statistical test was done as and when applicable.

3 Results

Table 1: Age and Sex Distribution of Acute Pancreatitis cases (n = 120)

Age (in years)	Sex		Total number of cases (%)
	Male	Female	
≤ 20	12	4	16 (13.3)
21-40	28	4	32 (26.7)
41-60	40	20	60 (50)
≥ 61	8	4	12 (10)

Table 2: Age and Sex Distribution of Chronic Pancreatitis cases (n = 228)

Age (in years)	Sex		Total number of cases (%)
	Male	Female	
≤ 20	8	4	12 (5.3)
21-40	88	8	96 (42.1)
41-60	80	8	88 (38.6)
≥ 61	28	4	32 (14.0)

Table 3: Alcohol history of Acute and Chronic Pancreatitis cases according to sex

Acute Pancreatitis (n = 120)			
Sex	Alcohol history		Total number of cases (%)
	Alcoholic	Non-Alcoholic	
Male	44	44	88 (73.3)
Female	0	32	32 (26.7)
Chronic Pancreatitis (n = 228)			
Sex	Alcohol history		Total number of cases (%)
	Alcoholic	Non-Alcoholic	
Male	172	32	204 (89.5)
Female	0	24	24 (10.5)

Among 348 cases of pancreatitis, 120 were diagnosed as cases of Acute Pancreatitis (AP) consisting of 88 males and 32 females (Table. 1). Among the total cases of Acute Pancreatitis 44 had a history of alcoholism, 76 were non alcoholics (Table. 3). Mean age (46) was more in alcoholics than in non-alcoholics (41.21). All the alcoholic cases of Acute Pancreatitis were male. All the alcoholic and non-alcoholic cases of Acute Pancreatitis (Alcoholic and non alcoholic AP hereafter) presented with abdominal pain and 90.9% of alcoholic cases (40 out of 44) presented with vomiting. Mean ESR (21.13) was

higher in non-alcoholic group than in alcoholics (18.3). The mean lipase (514.55), mean amylase (423.39) and mean ALP (218.84) in non-alcoholics were higher in comparison to alcoholic APs, mean lipase (495.98), mean amylase (361.38) and mean ALP (117.2). Mean bilirubin (1.74) was higher in alcoholics than in non-alcoholics (1.49). 44 non-alcoholic and 8 alcoholic AP cases had gallstones. Positive radiological features were present in 32 (72.72%) alcoholic APs and 60 (78.94%) non-alcoholic APs. Among all cases of Acute Pancreatitis, 52 (43.33%) had gallstone induced AP and among these 52 cases 8 had a history of alcoholism, 36 (30%) had alcohol induced AP and 32 (26.66%) had idiopathic AP (Table 5).

Table 4: Alcohol history of Acute and Chronic Pancreatitis cases according to Presenting features

Acute Pancreatitis (n = 120)			
Presenting features	Alcohol history		Total number of cases (%)
	Alcoholic	Non-Alcoholic	
Pain	44	76	120 (100)
Vomiting	40	56	96 (80)
Gallstone	8	44	52 (43.3)
Chronic Pancreatitis (n = 228)			
Presenting features	Alcohol history		Total number of cases (%)
	Alcoholic	Non-Alcoholic	
Pain	164	56	220 (96.5)
Vomiting	84	40	24 (10.5)
Gallstone	8	0	8 (3.5)
Pseudocyst	4	0	4 (1.8)
Calcification	68	8	76 (33.3)

There were 228 cases of Chronic Pancreatitis (CP) in our study. Among them 204 were males and 24 were females (Table 2). 172 had a history of alcoholism, 56 were non-alcoholic (Alcoholic and non alcoholic CP hereafter) (Table 4). Smoking was high among alcoholics. Among alcoholics all were male and the mean age (42.98) was higher in alcoholic CPs than in non-alcoholic CPs (38.86). Both alcoholic (95.3%) and non-alcoholic (100%) CPs presented with abdominal pain. 71.4% of non-alcoholic and 48.8% of alcoholic CPs presented with vomiting. The mean ESR (19.08), mean lipase (615.59), mean amylase (422.11) and mean ALP (192.77) were higher in non-alcoholic CPs than the alcoholic CPs, mean ESR (16.85), mean lipase (303.29), mean amylase (293.21) and mean ALP (151.67).

Table 5: Clinical parameters of Acute Pancreatitis cases (n = 120)

Clinical parameters	Overall (n=120) (Mean ± SD)	Alcoholic (n=44) (Mean ± SD)	Non-Alcoholic (n=76) (Mean ± SD)	P value
ESR (n=100)	20 ± 16.58	18.3 ± 15.28 (n=40)	21.13 ± 17.43 (n=60)	0.405
Lipase	507.74 ± 474.71	495.98 ± 590.71	514.55 ± 396.69	0.853
Amylase	400.66 ± 495.35	361.38 ± 589.90	423.39 ± 434.02	0.511
Glucose (n=44)	102.64 ± 23.67	102 ± 0.0 (n=4)	102.7 ± 24.86 (n=40)	0.860
Bilirubin (n=112)	1.58 ± 1.70	1.74 ± 1.82 (n=40)	1.49 ± 1.64 (n=72)	0.466
Alkaline Phosphatase (ALP) (n=116)	183.79 ± 180.39	117.2 ± 69.95 (n=40)	218.84 ± 209.14	0.000

Table 6: Clinical parameters of Chronic Pancreatitis cases (n = 228)

Clinical parameters	Overall (n=228) (Mean±SD)	Alcoholic (n=172) (Mean±SD)	Non-Alcoholic (n=56) (Mean±SD)	P value
ESR	17.48 ± 12.19 (n=184)	16.85 ± 12.73 (n=132)	19.08 ± 10.67 (n=52)	0.266
Lipase	379.99 ± 653.52	303.29 ± 313.17	615.59 ± 1175.96	0.054
Amylase	324.87 ± 421.09	293.21 ± 343.81	422.11 ± 592.94	0.127
Glucose	154.52 ± 84.86 (n=160)	142.03 ± 76.55 (n=116)	187.43 ± 97.08 (n=44)	0.007
Bilirubin	1.38 ± 2.15 (n=212)	1.51 ± 2.41 (n=164)	0.93 ± 0.53 (n=48)	0.005
ALP	161.57 ± 156.94 (n=216)	151.67 ± 109.05 (n=164)	192.77 ± 254.02 (n=52)	0.262

Mean bilirubin (1.51) was higher in alcoholic CPs than in non-alcoholic CPs (0.93). 8 alcoholic CP cases had gallstones, 4 alcoholic CP cases had pseudocyst, and 68 alcoholic CP cases had pancreatic calcifications while 8 non-alcoholic CP cases had pancreatic calcifications. Positive radiological features were present in 152 (88.37%) alcoholic CPs and 36 (64.28%) non-alcoholic CPs. Among all CP cases, 164 (71.92%) had alcohol induced CP, 56 (24.56%) had idiopathic CP and 8 (3.5%) had gallstone induced CP and all the gallstone induced CPs had a history of alcoholism (Table 4). Among the clinical parameters, ALP level was significantly associated with Acute Pancreatitis (p < 0.01) while Glucose and Bilirubin level were significantly associated with Chronic Pancreatitis (p = 0.007 and 0.005 respectively).

4 Discussion

This retrospective observational study was conducted at a Medical College and Hospital of West Bengal, which revealed significant insights into the clinical presentations and investigational findings of acute and chronic pancreatitis reviewing 348 records of Pancreatitis among which 120 were Acute Pancreatitis (AP) cases and 228 were Chronic Pancreatitis (CP) cases.

Among the total AP cases, 36.66% (44) were alcoholics and 63.33% (76) were non-alcoholics. In this study, the mean age in alcoholics is 46 ± 13.98 and in non-alcoholics is 41.21 ± 17.91 which is similar to the findings in the study done by Mukherjee *et al.*¹¹, Negi *et al.*¹² and Raghu *et al.*¹³, that reported mean ages of 44.4 ± 10.8 years, 42.89 ± 12.5 years, 42.9 ± 15.9 years respectively but Patel *et al.*¹⁴ got a lower finding of 36.96 ± 15.9 years in their study, interestingly the minimum age of a patient is 11 in our group. The Gender ratio (M:F) in non-alcoholics is 1.375:1 which are comparable with the studies of Patel *et al.*¹⁴ and Uhl¹⁵ that reported a male to female ratio of 2.75:1 in alcoholics and 1.85:1 in non-alcoholics. All alcoholic and non-alcoholic AP cases has been presented with abdominal pain. Vomiting is present in 90.9% of alcoholics and 73.68% of non-alcoholics and this is similar to what has been reported by Negi *et al.*¹², Patel *et al.*¹⁴, Rao¹⁶. In alcoholic AP cases the mean ESR, mean lipase, mean amylase and the mean bilirubin level were 1.22 times, 3.09 times, 3.29 times and 1.35 times of the upper limit of normal respectively whereas the mean ALP level was under normal limit. In non-alcoholic AP cases the mean ESR, mean lipase, mean amylase and the mean bilirubin level were 1.41 times, 3.22 times, 3.85 times and 1.15 times of the upper limit of normal respectively and the mean ALP level is 1.49 times of the upper limit of normal. A study done by Reddy *et al.*¹⁷ found majority of their study population has amylase levels 3 times of the upper limit of normal and lipase levels almost 3 times of the upper limit of normal. 72.72% alcoholics and 78.94% non-alcoholics has positive radiological features of AP. In this study, gallstone induced pancreatitis is the most common cause of acute pancreatitis seen in 52 (43.33%) patients of AP followed by alcohol in 36 (30%) and idiopathic in 32 (26.66%). In the study conducted by Jha *et al.*¹⁸, biliary pancreatitis has been seen in 63% followed by alcohol in 27%, idiopathic in 6%. But study done by Ramu *et al.*¹⁹, found alcohol induced pancreatitis is higher (42.431%) followed by idiopathic pancreatitis (36.926%). In females, gallstone is the most common aetiology seen in 87.5% followed by idiopathic in 12.5% cases. In males, alcohol is the most common aetiology seen in 40.9% followed by idiopathic in 31.81% and gallstone in 27.27%. Jha *et al.*¹⁸ and Yadav *et al.*²⁰ concluded in their study that gallstone pancreatitis is more common in females, seen in 88% and similar to our study their study found alcoholic pancreatitis to be more common in middle age males.

Among the total CP cases in the study population, 75.43% (172) were alcoholics and 24.56% (56) were non-alcoholics. In this study, the mean age in alcoholics was 42.98 ± 14.25 and the mean age in non-alcoholics was 38.86 ± 16.34 which is similar to the findings of Jha AK *et al.*²¹, that reported the mean age of 39.57 years, interestingly the minimum age of a patient is 10 in this study group. The gender ratio in non-alcoholics was 1.33:1 which is comparable with the findings of Jha AK *et al.*²¹ and Bhattacharjee *et al.*²² that reported male to female ratio of 3.84:1 in alcoholics and 3.8:1 in non-alcoholics. Abdominal pain was present in 95.3% of alcoholics and in 100% of non-alcoholics. 48.8% of alcoholics and 71.4% of non-alcoholics presented with vomiting. Studies done by Jha AK *et al.*²¹, Bhattacharjee *et al.*²² and Balakrishnan *et al.*²³ found abdominal pain as the most frequent symptom. The alcoholics reported with the mean ESR, mean lipase, mean amylase and the mean bilirubin level as 1.12 times, 1.9 times, 2.67 times and 1.16 times of the upper limit of normal and the mean ALP level-1.03 times of the upper limit of normal. The non alcoholics reported the mean ESR, mean lipase and mean amylase as 1.27 times, 3.85 times, 3.84 times and 1.31 times of the upper limit of normal whereas the mean bilirubin is within normal limit. 88.37% alcoholics and 64.28% non-alcoholics has positive radiological features of CP. In this study, alcohol induced pancreatitis was found to be the most common cause of chronic pancreatitis seen in 164 (71.92%) patients of CP followed by idiopathic in 56 (24.56%) and gallstone in 8 (3.5%). But the studies conducted by Jha AK *et al.*²¹, Bhattacharjee *et al.*²² showed idiopathic CP as the most common form of CP (50.35%, 41.4% respectively) followed by alcoholic CP (33.81%, 37.9% respectively). Idiopathic CP is the only form of CP that has been seen in females of this study group. In males, alcohol is the most common aetiology seen in 80.39% followed by idiopathic in 15.68% and gallstone in 3.92%. Keeping the findings of the present record based study restricted up to the observation, the researchers refrained from any discussion regarding statistical correlation between the considered parameters.

5 Conclusions

This study revealed that patients with non-alcoholic APs and CPs exhibited higher levels of biochemical and haematological markers compared to those with alcoholic APs and CPs. The age and sex ratio analysis revealed a higher incidence of AP among males aged 41-60 years. The commonest aetiologies among APs were: gallstone (43.33%), alcohol (30%), idiopathic (26.66%). The age and sex ratio analysis revealed a higher incidence of CP among males aged 21-40 years with a history of alcohol abuse. Pancreatic calcifications were present significantly higher in alcoholic CP cases compared to non-alcoholic CP cases. The commonest aetiologies among CPs were: alcohol (71.92%), idiopathic (24.56%), gallstone (3.5%). The findings of this study contribute to our understanding of the relationship between alcohol and pancreatitis.

Limitations:

This study has a small sample size, and it is a single centre study. There is a lack of follow up. These findings may be due to referral bias and not reflective of the community. We couldn't find the smoking history of many study subjects.

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Author's Contribution

Indrani Dey, Sanjay Sengupta - Concept and design of the study, prepared first draft of manuscript; Indrani Dey, Sanjay Sengupta, Sohanjan Chakraborty- Reviewed the literature, and manuscript preparation; Indrani Dey, Sanjay Sengupta, Sohanjan Chakraborty, Nitish Kumar Sen - Concept, coordination, statistical analysis and interpretation, Interpreted the results; Indrani Dey, Sanjay Sengupta, Sohanjan Chakraborty, Nitish Kumar Sen- Revision of the manuscript.

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