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A Study of Clinical Pattern of Pancreatitis Among Alcohol Users Attending Surgical Department of a Tertiary Care Hospital in South Gujarat

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ABSTRACT
Excessive ethanol consumption is the primary global cause of acute pancreatitis (AP), responsible for 35% of cases, with a higher prevalence in young men aged 30-45. However, only 5-10% of drinkers develop AP. Factors include prolonged and intense alcohol abuse (>100 g daily for at least 5 years), smoking and genetic factors. In South Gujarat, locally produced country-made liquors like Mahudo and Navsar are prevalent. This study assessed AP's clinical presentation at diagnosis and complications related to alcohol type in South Gujarat. The study encompassed all confirmed cases of alcoholic pancreatitis originating from the South Gujarat region. A total of 61 patients who met the inclusion criteria for pancreatitis diagnosis at our facility were identified. Pertinent information regarding alcohol consumption was obtained and documented from the Forensic science laboratory situated near the Daman Ganga office in valsad. The nature of complications observed is contingent upon the type of alcohol consumed. A statistically significant association was established between the presence of complications and the type of alcohol consumed, with a p-value of 0.0278 at a 5% level of significance. Notably, the proportion of complications demonstrated a heightened incidence among individuals who consumed Navsar alcohol in comparison to those who favored Mahudo alcohol.

INTRODUCTION

Pancreatitis stands as a prevailing etiology of acute abdominal pain necessitating hospitalization[1]. It manifests as acute pancreatitis, characterized by the inflammatory process within the pancreatic parenchyma, presenting clinical features including severe abdominal pain and nausea[2]. Predominantly, the primary causative factors accounting for up to 95% of cases comprise alcohol consumption and the presence of gallstones. Furthermore, additional contributory factors encompass traumatic events, pharmacological agents, infections, hyperlipidemia, hypercalcemia, HIV infection, neoplastic conditions and idiopathic origins[3]. Acute pancreatitis, abbreviated as AP, represents an inflammatory pathology affecting the pancreas, typified by abdominal discomfort and elevated concentrations of pancreatic enzymes in the circulatory system. The annual incidence of acute pancreatitis exhibits a range spanning from 13-45 per 100,000 individuals. In parallel, chronic pancreatitis, denoted as CP, demonstrates an annual incidence ranging between 5-12 cases per 100,000 individuals, with a prevailing prevalence estimated at approximately 50 cases per 100,000 individuals[4-7]. Notably, the prevalence rates for men and women in the Indian population are calculated at 8.6 and 8.0 per 100,000, respectively[4-7].

Nonetheless, it is acknowledged that approximately 70% of pancreatitis cases are attributed to persistent, excessive alcohol consumption, although this proportion exhibits variations across different geographical regions[8-10]. Notably, it is a well-established fact that the likelihood of developing acute pancreatitis (AP) escalates in correlation with escalating alcohol doses and the prolonged duration of alcohol misuse. However, epidemiological investigations have underscored that only a minority of heavy alcohol consumers manifest overt episodes of pancreatitis[11]. Globally, excessive ethanol intake stands as the predominant causative factor for AP, contributing to 35% of cases. This predilection is particularly pronounced in young males aged between 30 and 45 years, with a lesser prevalence observed in females. Nevertheless, it should be noted that only a subset of individuals, ranging from 5-10%, who engage in alcohol consumption ultimately develop AP. Key determinants amplifying the risk of ethanol-induced pancreatitis encompass prolonged and excessive ethanol abuse, defined as a daily intake exceeding 100 g sustained over at least five years, concomitant tobacco consumption and inherent genetic susceptibility[12].

Alcohol consumption and smoking are recognized as factors that not only elevate the risk of pancreatitis but also contribute to its progression. Among these factors, the quantity and duration of alcohol consumption stand out as the foremost influencers in augmenting pancreatitis risk. Clinical manifestations of pancreatitis materialize in approximately 5% of individuals with a history of heavy alcohol consumption. Moreover, alcohol renders the pancreas more susceptible to additional insults and injuries[13-15].

In South Gujarat, people consume more locally produced country-made liquor mainly MAHUDO and NAVSAR. The present study was conducted at a tertiary healthcare institute to assess the clinical pattern of acute pancreatitis at the time of presentation in South Gujarat and to study the complications of pancreatitis in relation to the type of alcohol consumed in South Gujarat during follow-up of patients.

The aim is to study the clinical pattern of pancreatitis with relation to the chemical nature of alcohol as the alcohol commonly used in South Gujarat is prepared from natural sources (Mahuda) and synthetic alcohol is prepared from fermentation with chemical agents (Navsar) Jaggery.

MATERIALS AND METHODS

The study was carried out after taking ethical committee's approval. Patients of pancreatitis were admitted to the surgical ward of GMERS Hospital, Valsad, Gujarat from October 2020 to June 2022. Before starting the study written informed consent of each patient was obtained. All confirmed cases of alcoholic pancreatitis coming from the region of South Gujarat were included in the study. Patients were excluded from the study if patients with only gallstone/hypertriglyceridemia/drugs caused pancreatitis/POST ERCP, patients not belonging to South Gujarat, malignancies of the pancreas or patients with pancreatitis who had undergone any surgery previously, patients who did not give informed/written consent.

Patients were reviewed based on their history, clinical findings, haematological and radiological investigations and follow-up of the patients was taken 3 months.

Statistical analysis: The data collection process involved employing a standardized, semi-structured and pre-validated case record proforma. Subsequently, this data was input into MS Excel software. To enhance clarity and facilitate a better understanding of the data's frequency distribution, it was presented in the form of tables and charts. For statistical analysis, SPSS Version 22 software was utilized. To assess the central tendencies of quantitative data measures such as Mean, Standard Deviation and Median were computed. The association between quantitative parameters was examined using the student's t-test.

Qualitative data, whether nominal or ordinal, underwent analysis through the Chi-square test. Significance in differences between observations was determined based on a $p<0.05$.

RESULTS

There were 61 cases among which only 1 was female rest were all males (98.4%). Most cases belonged to the age group of 20-40 (60.7%) followed by 40-60 (32.8%). About 65.6% of cases belonged to the lower class while 34.4% belonged to the middle class as shown in Table 1.

We observed that the majority of the subjects belong to Valsad District 27 (44.26%), followed by Dang District 13 (21.31%), rural part of Surat 11 (18.03%), 4 (6.56%) from Navsari District and Urban part of Surat and 2 (3.28%) subjects were from Tapi district.

We observed that 26.2%, i.e., 16 among 61 cases consumed branded liquor while 54.1% of cases were noted to consume alcohol made from Mahuda, 19.7% consumed NAVSAR alcohol and 26.2% consumed branded liquor.

In the present study, we compared the type of alcohol consumed and geographical areas in south Gujarat. It was observed that 42.42% of consumers of Mahuda belonged to the Valsad district, followed by the Dang district (21.21%). Whereas 58.33% of Navsar consumption was from the Valsad district followed by rural parts of Surat (25%) and Dang district (16.67%) as shown in Fig. 1.

We observed that 59% of cases suffered from acute pancreatitis while 41% suffered from chronic pancreatitis. In the current study subjects, 17 subjects (27.9%) reported comorbidities while in 44 cases (72%) cases, no comorbidities were observed. We observed that tenderness was present in 44 (72.1%) subjects. Guarding was present in 17 (27.9%) patients, rigidity was observed in 5 (8.2%) cases, fluid thrill was noted in 7 (11.5%) cases while palpable mass was observed in 4 (6.6%) cases. Shifting dullness was present in 8 patients (13.1%) (Table 2).

We observed that out of a total of 61 patients, various complications such as Pseudocyst, Splenic vein thrombosis, Portal vein thrombosis, left pleural effusion, Pancreatic ascites and Portal vein thrombosis were observed. About 25 (41%) subjects had complications whereas 36 (59%) patients had no complications (Table 2).

It is concluded that the complications depend on the type of alcohol consumed. The p-value 0.0278 is significant at 5% level of significance which means there is an association between the presence of complication and the type of alcohol consumed. Also, it can be noted from Table 3 that the proportion of complications is higher in those who consumed the alcohol Navsar in comparison to Mahuda.

Table 1: Demographic data of study participants

Parameters	No. of subjects	Percentage
Gender		
Male	60	98.4
Female	1	1.6
Age group (years)		
0-20	2	3.3
20-40	37	60.7
40-60	20	32.8
60 and above	2	3.3
Socio-economic status		
Low	40	65.6
Middle	21	34.4

Table 2: Disease characteristics of study participants

Parameters	No.	Percentage
Pancreatitis		
Acute	36	59.00
Chronic	25	41.00
Signs of pancreatitis		
Tenderness	44	72.10
Guarding	17	27.90
Rigidity	5	8.20
Fluid thrill	7	11.50
Palpable mass	4	6.60
Shifting dullness	8	13.10
Co-morbidities		
Present	17	27.90
Absent	44	72.10
Complications		
Present	25	41.00
Absent	36	59.00
Complications type		
Pseudocyst	10	16.39
Pancreatic ascites	8	13.11
Portal vein thrombosis	4	6.56
Pleural effusion	2	3.28
Splenic vein thrombosis	1	1.64
Pancreatic pleural fistula	1	1.64

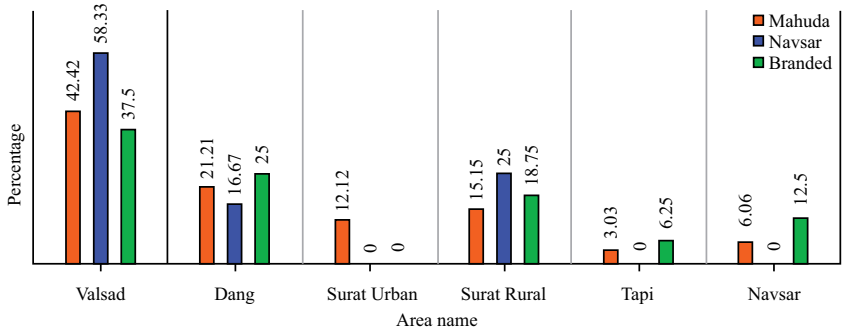

Fig. 1: Geographical area-wise consumption of alcohol type

Table 3: Association between type of alcohol consumed and complications

	Complications						
	Present		Absent				
Type of alcohol	No.	Percentage	No.	Percentage	Total	χ^2-value	p-value
Mahuda	11	33.33	22	66.33	33	7.17	0.02
Navsar	9	75.00	3	25.00	12		
Branded	5	31.30	11	68.70	16		
Total	25		36		61		

Table 4: Follow up findings

Follow up findings	No. of subjects	Percentages
Lost to follow up	36	59 (N = 61)
Resumed alcohol consumption	18	72 (N = 25)
Developed diabetes mellitus	3	12 (N = 25)

We observed that about 36 (59%) patients were lost to follow-up at 3 months. Out of the remaining 25 patients, 18 (72%) were still consuming alcohol. About 3 patients were developed diabetes mellitus on follow-up (Table 4).

DISCUSSIONS

Alcoholic pancreatitis, whether acute or chronic is a potentially deadly condition. Both types share symptoms such as abdominal pain and disruption of normal pancreatic function. The prevalence of alcoholic pancreatitis is uncertain but it contributes significantly to global illness and mortality. However, the proportion of pancreatitis cases linked to alcohol varies widely across countries and studies.

Alcohol ranks as the second most common cause of acute pancreatitis after gallstones. Initial symptoms include abdominal pain, jaundice, common bile duct blockage and pancreatic insufficiency. Typically, alcoholic pancreatitis begins in a person's 4th decade with an average alcohol consumption of approximately 150 g day^{-1} over 10-15 years. Patients initially experience acute abdominal pain, elevated pancreatic enzyme levels and imaging evidence of pancreatic damage[3].

In the present study, the maximum number of cases were observed in the age group of 20-40 years which was 60.7% followed by 40-60 years which was 32.8%. Various studies have reported different mean ages among individuals with pancreatitis. In North India, Singh *et al*.[16] observed a mean age of 37.8±9.2 years. In India, patients with alcoholic liver cirrhosis had a mean age of 52.4 years, while those with alcoholic chronic pancreatitis had a mean age of 47.1 years[17-18]. A study conducted at AIMS Kochi found that patients experiencing pancreatitis attacks had a mean age of 39.7±14.1 years[19]. In the United Kingdom, pancreatitis has an annual incidence of approximately 1 person per 100,000, with a primary association with alcohol misuse and a predilection for men aged 40-50 years[20]. In Saudi Arabia between 1996 and 1998, the mean patient age was reported as 51 years[21].

In our current investigation, we observed a marked predominance of males, constituting 98.4% of the cases, exemplifying a pronounced male sex predilection, with 60 males and only 01 female. A similar pattern of male preponderance was evident in the study conducted by Balakrishnan *et al*.[19] at AIMS Kochi, where 733 (71.0%) of the subjects were male, compared to 300 (29.0%) females, signifying that pancreatitis exhibited a prevalence in males more than two times higher than in females. This conspicuous male predominance aligns with findings reported by Narender and Pappu[22], who observed a male-to-female ratio of 9:1. Furthermore, our findings are consistent with the study conducted by Vengadakrishnan and Koushik[23], where a distinct male predominance was evident, with a male-to-female ratio of 5:1.

In the present study, approximately 65.6% of cases were from the lower class, with 34.4% from the middle class. In a multicentric Indian study by AIIMS Kochi, the socioeconomic distribution was as follows, upper class 8.1%, middle class 58.1% and lower class 33.8%[19] Abu-Eshy[21] reported 8.9% upper class, 35% middle class and 56.1% lower class cases. Bodil[24] found pancreatitis to be more common in the middle and lower classes, accounting for 45 and 41%, respectively, while the upper class constituted 14% of the cases.

In our study, we categorized subjects based on their alcohol consumption. We found that 26.2% (16 out of 61 cases) consumed any type of alcohol, primarily licensed branded liquor. Additionally, 54.1% consumed alcohol made from Mahuda and 19.7% consumed Navsar alcohol and 26.2% consumed branded liquor. In Soni *et al*.[25] study, 67.8% of patients with alcohol-related diseases consumed country liquor and the remaining 32.1% consumed India-made foreign liquor. Among those, whisky was the most commonly consumed type of India-made foreign liquor (83.3%), with a smaller proportion (16.7%) using rum and/or beer.

In our study, we examined the clinical signs among the subjects and found that tenderness was present in 72.1% of cases, guarding in 27.9%, rigidity in 8.2%, fluid thrill in 11.5% and palpable mass in 6.6%. Shifting dullness was present in 13.1% of patients. Ramu *et al*.[26] observed that the most common clinical presentation in their study was epigastric pain without radiation to the back

(51.6%), followed by epigastric pain radiating to the back in 29.1% while Nausea and vomiting were noted in the majority of cases (70.2%). Abu Sayeed recorded that 75% of cases presented with abdominal pain, while Abu-Eshy[21] and Kaushik *et al*.[27] found that 81% of cases had abdominal pain as their primary complaint.

In our study, we observed complications in 41% of subjects, while 59% had no complications. The most common complication was pseudocyst, occurring in 16.39% of subjects, followed by pancreatic ascites/fluid collection in 13.11%, portal vein thrombosis in 6.56%, pleural effusion in 3.28% and splenic vein thrombosis and pancreatic pleural fistula each in 1.64% of subjects. Ramu *et al*.[26] found that acute peripancreatic fluid collection, pancreatic pseudocyst and pancreatic necrosis were observed in 40.8% of cases. Pseudocysts were often the most common complication associated with pancreatitis, followed by biliary tract complications and issues like pleural effusion, ascites, splenic vein thrombosis or abscess. Samir Habashi and Draganov[28] reported a low incidence of pseudocysts in adults, ranging from 1.6-4.5% per year, with a higher incidence in chronic pancreatitis compared to acute pancreatitis, while Multiple pseudocysts were found in 11-18% of cases. Bodil[24] noted lung damage as the most common extra-pancreatic complication, including bronchopneumonia, right-sided pleural effusion and left-sided pleural effusion. Balakrishnan *et al*.[19] identified pseudocysts (15.8%) and biliary obstruction (8.2%) as the most common complications.

The type of alcohol consumed has a significant impact on complications, with a p-value of 0.0278 at a 5% significance level, indicating an association between complication presence and alcohol type. Complication rates are higher in those who consume Navsar alcohol compared to Mahuda and branded liquor. Barreto *et al*.[29] analyzed three locally distilled alcoholic products and found that they contained additional compounds besides ethanol, including long-chain alcohols, aldehydes, acids and traces of methanol. This raises concerns about their potential to induce pancreatic damage, given the high incidence of alcohol-related acute pancreatitis (AP) in populations where these products are consumed. Lachenmeier *et al*.[30] conducted chemical analyses on a sample of alcohol products and assessed various parameters, including alcoholic strength, volatiles, ethyl carbamate, inorganic elements and food additives like preservatives, colours and sweeteners.

CONCLUSION

The study cohort exhibited a mean age of 38.02±12.13 years, with a male-to-female ratio of 60:1. Among the study participants, 54.1% were observed to consume alcohol derived from mahuda, while 19.7% consumed navsar alcohol and 26.2% consumed branded liquor. It was observed that individuals who consumed Navsar alcohol experienced a higher proportion of complications compared to those who consumed Mahuda alcohol.

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