

Demographic profile of patients with acute pancreatitis presenting to department of surgery, jorhat medical college: A clinical study

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Abstract

Background: Acute Pancreatitis is a major health problem with significant morbidity and mortality. There is large geographical variability in incidence, disease severity and outcome with data related to prevalence rate lacking in our region. Present study is aimed to observe its demographic variability around the Jorhat Medical College.

Methods: First consecutive 50 cases of acute pancreatitis presented in the Jorhat Medical College during the study period from June 2020 to May 2021 were included in the study; data collected, systematically analyzed and statistically reviewed.

Results: Of the 50 cases, 33 (60%) were male while 17 (34%) were female. The mean age of the study sample is 37.04 ± 13.52 (SD) years, ranging from 15 – 75 years. Majority of the patients are between 15-35 years. In 50% cases, alcohol is the most common aetiology followed by gallstones (36%), idiopathic in 10% cases. Alcohol is the most common aetiology among male and 15-35 years age group while gallstone is most common cause in females and 35-55 years age group. Among 50 cases, 41 (82%) are mild acute pancreatitis and 9 (18%) have severe acute pancreatitis. Majority of severe acute pancreatitis cases are male and alcoholic. Of 50 cases, among Hindus (n= 47) ethnic Assamese are 54%, Tea tribe 20%, Mising 10%, UP 6%, Bengali 4%, while Muslim 4% and Christian 2%. Gallstone is most common cause among ethnic Assamese and alcohol is the common cause in Tea tribe and Mising. Geographical distributions of the cases are as follows: Jorhat district 50% (n=25), Golaghat 32% (n= 16), Majuli 14% (n= 7) and Sivasagar 4% (n=2).

Conclusion: Acute pancreatitis is more common among male than female. Assamese are the most commonly affected ethnic group, gallstone being the most common cause among them. Alcohol is the most common aetiology in Tea tribes and Mising community. Male and alcoholics are more prone to severe acute pancreatitis. The incidence of acute pancreatitis is more in younger population 15-35 years and alcohol is the most common cause in this age group. Most of the cases are from Jorhat district followed by Golaghat, Majuli and Sivasagar.

Keywords: Acute pancreatitis, alcohol, demography, ethnicity

Introduction

Acute Pancreatitis is an inflammatory process due to auto digestion of gland by pancreatic digestive enzymes, leading to impairment of function or any morphologic changes ^[1]. Acute pancreatitis is mild and self-limiting without serious complications in 80% of patients. Demography as understood today is the scientific study of human population ^[2]. Morbidity and mortality is seen in up to 20% of patients despite aggressive intervention in severe cases ^[3]. The aetiology, severity as well as the outcome of the disease varies considerably with the demographics of the patient and prevalence of the risk factors in different parts of the world ^[4]. And data related to prevalence of risk factors and its relation to demographics is lacking in this part of the country.

Aims and objectives

To study the demographic characteristics of acute pancreatitis in patients presenting to Department of Surgery, Jorhat Medical College.

To find out the factors influencing the increased prevalence of acute pancreatitis (if any).

Materials and method

The study was conducted after proper approval by Institutional Ethical Committee at Jorhat Medical College.

This is a cohort study, conducted in the Department of Surgery, Jorhat Medical College where consecutively 50 patients with diagnosis of acute pancreatitis or patients with acute pancreatitis that were referred to our department were included over a period of 1 year (June 2020 to May 2021)

Inclusion Criteria

- All patients with diagnosis of acute pancreatitis and willing to participate were included.

Exclusion Criteria

- Suspected Hollow Viscus Perforation with raised amylase level
- Chronic Pancreatitis
- Pancreatic Malignancy
- Patient not willing to participate

The diagnosis of acute pancreatitis was made according to revised Atlanta classification (2012) ^[5], if two of the following three criteria were met:

- a) Abdominal pain consistent with acute pancreatitis (acute onset of a persistent, severe, epigastric pain often radiating to the back).
- b) Serum lipase or amylase activity at least three times greater than the upper limit of normal
- c) Characteristic findings of acute pancreatitis on contrast-enhanced computed tomography (CECT) and less commonly magnetic resonance imaging (MRI) or transabdominal ultrasonography.

BISAP scoring ^[6] is done within 24 hours of admission and data were tabulated for analysis. BISAP scoring is used over Ranson's and APACHE II as it is less complicated, its components are few, routinely done and easily available in rural health centers, and severity can be calculated within first 24 hours unlike Ranson's. It has sensitivity of 97.6% and

specificity of 94.8% as calculated by Yadav *et al.* [18]. The scoring criteria are given in Table 1. One point is assigned for each of the variables, within 24 hours of presentation. The BISAP score ≥ 3 in first 24 hours is considered as predictive of severe pancreatitis and < 3 as mild pancreatitis.

Table 1: BISAP scoring parameters

Parameters	Score 0	Score 1
Blood Urea Nitrogen	<25 mg/dl	>25 mg/dl
Impaired mental status	Absent	Present
SIRS	Absent	Present
Age	<60 years	>60 years
Pleural Effusion	Absent	Present

SIRS (Systemic Inflammatory Response Syndrome) is diagnosed by presence of any two of criteria: (a) Temperature ($<36^{\circ}\text{C}$ or $>38^{\circ}\text{C}$), (b) Pulse $> 90/\text{min}$, (c) Respiratory Rate >20 or $\text{PaCO}_2 < 32\text{mmHg}$, and (d) WBC $>12,000/\text{mm}^3$ or $<4,000/\text{mm}^3$ or $>10\%$ bands. A detailed history, physical examination and investigations were done, data maintained and statistical analysis done in MS- Excel 2007. Chi square test were carried out and $p < 0.05$ were accepted as statistically significant.

Observation and Result

Gender

Males are predominant (n=33, 66%) in our study than female (n=17, 34%). Male to female ratio is 1.94:1.

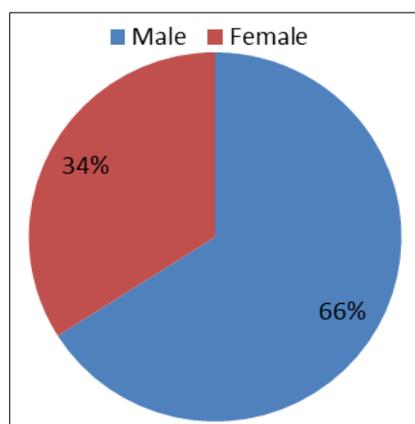


Fig 1: Sex Distribution

Age

The mean age of the study sample is 37.04 ± 13.524 (SD) years, which is significantly lower than study done by Robert SE *et al.* [19] which is 57.7 years. There is no significant difference in mean age among males and females as it was 36.242 ± 13.77 (SD) years and 38.588 ± 12.87 (SD) years respectively.

Youngest patient in our study was 15 years and the oldest was 75 years. Majority of the patients (n=25, $p < 0.05$) were between 15-35 years of age. Acute pancreatitis is more common among male (n=18, $p < 0.05$) in the younger age group of 15-35 years and female (n=10) were in older age group of 36-55 years. This is contrary to study done by Roberts SE *et al.* where incidence is more in women aged < 53 years and male in age group 35-45 years [19].

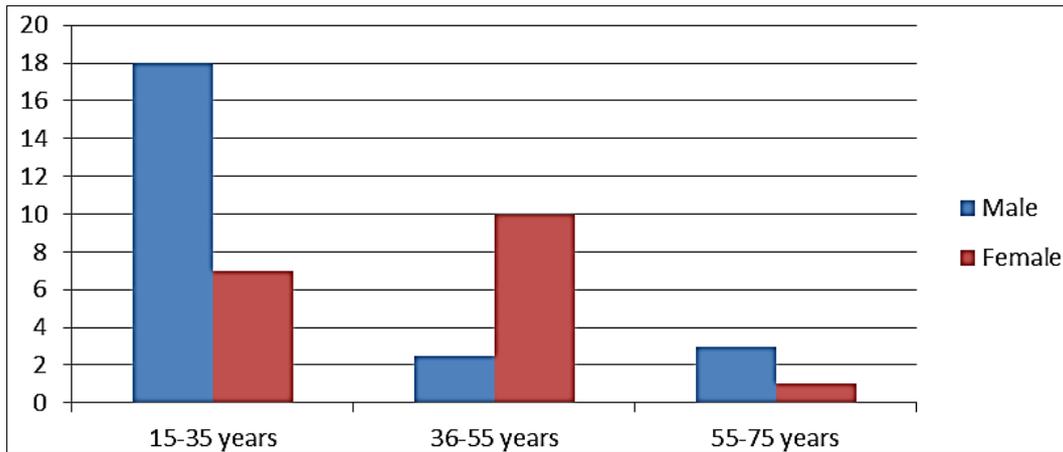


Fig 2: Age distribution of cases

Table 2: Clinical Presentation of the study sample

Presentation	Present(N=)	Percentage
Epigastric pain	42	84%
Umbilical pain	5	10%
Generalised pain	2	4%
Nausea & Vomiting	24	48%
Dehydration	16	32%
Icterus	5	10%

Aetiology

Alcohol and gall stones account to up to 86% of cases of acute pancreatitis.

Alcohol is identified as the predominant factor associated with acute pancreatitis in this study and it is noted in 50% (n=25, p<0.001) of the patients. All were male.

Biliary pancreatitis is second most common cause in 36% (n=18) of the patients with female being most affected i.e. 86.6% (n=13, p<0.001) than male 13.4% (n=5).

No aetiology could be attributed in 10% of the patients (n=5) using our diagnostic tool and they were considered to be idiopathic.

Pancreatic divi-sum (n=1) and hypertriglyceridemia (n=1) were other causes of acute pancreatitis in our study.

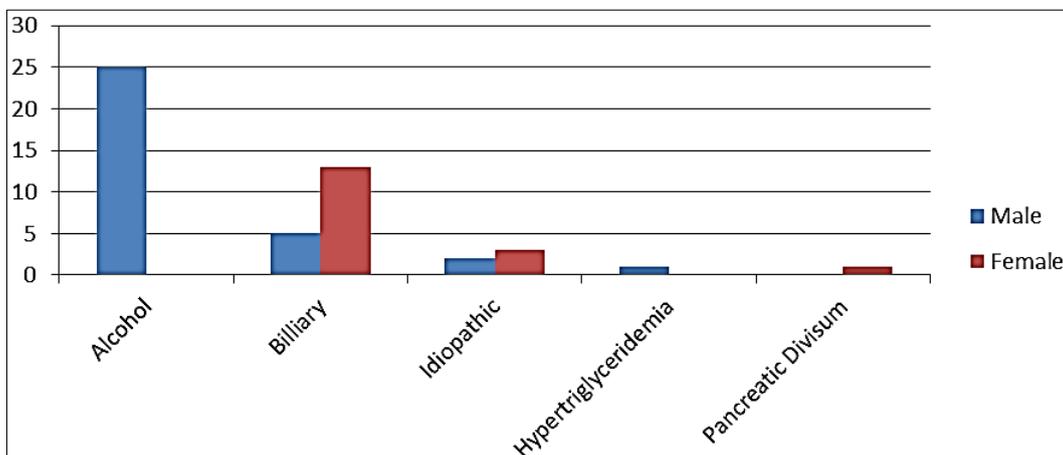


Fig 3: Distribution of Etiology with gender breakdown.

Table 4: Distribution of aetiology according to age

Age	Alcohol	Gall Stone	Idiopathic	Others
15-35 yrs	16 (64%)	6 (24%)	2 (8%)	1 (4%)
36-55 yrs	8 (38%)	11(52.38%)	2 (9.5%)	0
56-75 yrs	1(25%)	1 (25%)	1 (25%)	1 (25%)

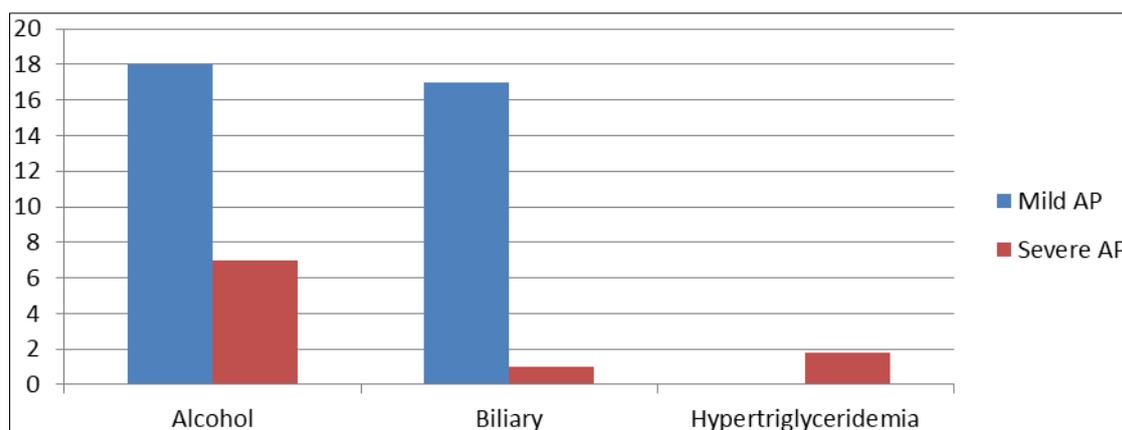
Alcohol is the most common aetiology (n= 16, p<0.05) of acute pancreatitis in younger age group (15-35 years). Gall stone (n=11, p<0.05) is the most common aetiology in older age group (36-55 years).

Severity

Of the total cases, 82% (n=41) had mild acute pancreatitis while 18% (n=9) cases had severe form of the disease and the mean length of hospital stay was 8.6 ± 5.8 (SD) days.

Table 5: Severity grading of Acute Pancreatitis (AP) using BISAP score

Severity	BISAP Score	No of Patients	Percentage
Mild AP	<3	41	82%
Severe AP	≥ 3	9	18%

**Fig 4:** Severity of Acute Pancreatitis based on aetiology

Alcohol is the most common aetiology of severe acute pancreatitis in 77.77% cases (n=7, not significant at p<0.05) in our study while gall stone (n=1) and hypertriglyceridemia (n=1) were other causes.

Among severe acute pancreatitis 88.88% are male (n=8, not significant at p>0.05) and 1 is female (11.12%).

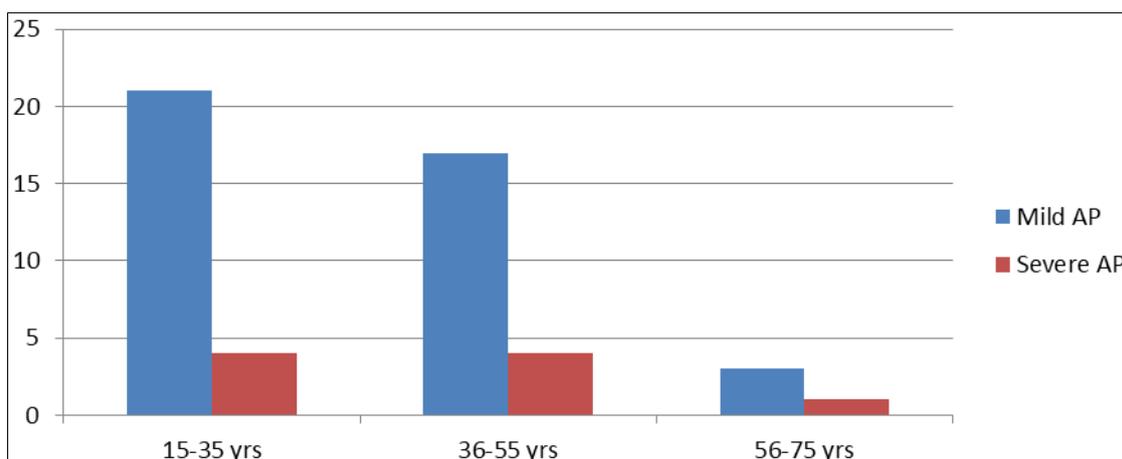


Fig 5: Distribution of severity based on age category.

The incidence of severe acute pancreatitis is equal among age group 15-35 years (n=4) and 36-55 years (n= 4).

Community Breakdown

The ethnic breakdown of the study population was Hindus 84% (n=47), Muslim 4% (n=2) and Christian 2% (n=1). Amongst Hindus ethnic Assamese 54% (n=27), Tea Tribe 20% (n=10), Mising 10% (n=5), UP* 6% (n=3) and Bengali 4% (n=2). A Christian from Karbi community was in the study sample (n=1).

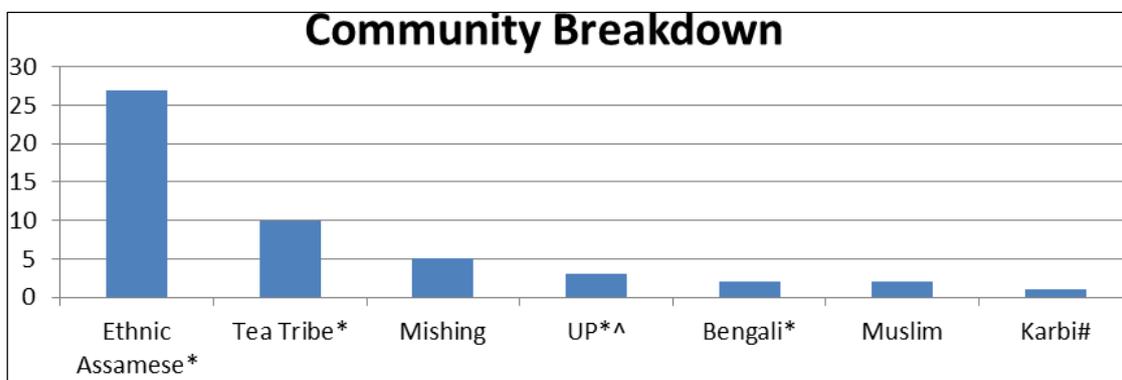


Fig 6: Community wise breakdown of incidence of Acute Pancreatitis. *^UP= Uttar Pradesh *Hindus #Christian

Table 8: Distribution of etiologic factors among various ethnicity. * Uttar Pradesh

Hindus	Alcohol	Biliary	Idiopathic	Others
Ethnic Assamese (n=27)	11 (40.7%)	13 (48.1%)	2 (7.4%)	1
Tea Tribe (n=10)	7 (70%)	2 (20%)	1 (10%)	0
Mising (n= 5)	3 (60%)	1 (20%)	1 (20%)	0
UP* (n=3)	2	1	0	0
Bengali (n=2)	2	0	0	0

Gall stone is the most common cause of acute pancreatitis in ethnic Assamese (n=13, p=0.05) but it is not significant. Contrary to that alcohol is the most common cause of acute pancreatitis among Tea Tribes (n= 7, p >0.015) and Mising community (n=3, p>0.05) but is again not significant.

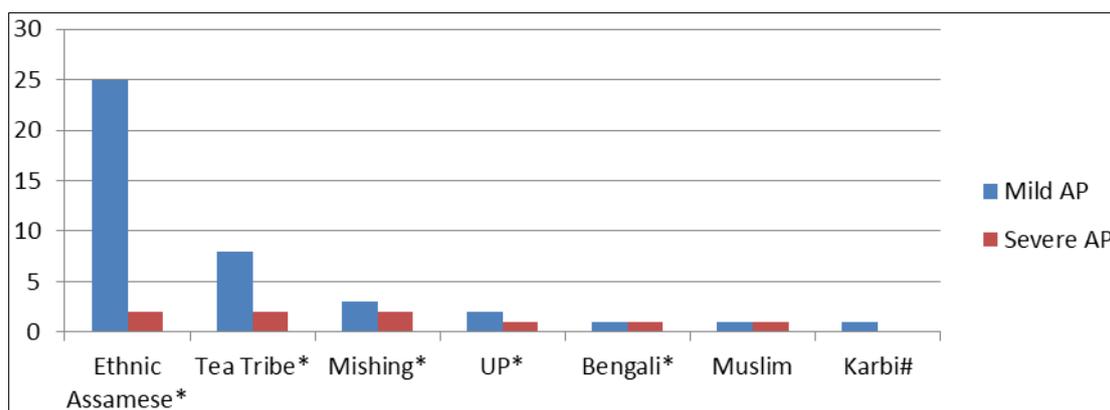


Fig 7: Distribution of severity of Acute Pancreatitis based on community *Hindus #Christian

Ethnic Assamese community is commonly affected ($n=27$, $p<0.05$) among all communities. Among other communities the incidence is not significant, Tea tribe ($n=10$, $p>0.05$) Mising ($n=5$, $p>0.05$).

Geographical Distribution

Geographical distribution of the cases are as follows: Jorhat district 50% ($n=25$), Golaghat 32% ($n= 16$), Majuli 14% ($n= 7$) and Sivasagar 4% ($n=2$).

Locality	n=
Jorhat Town	12
Pulibor	5
Mariani	4
Titabar	3
Majuli	7
Golaghat Town	6
Dergaon	6
Bokakhat	4
Amguri	2

Interpretation

Male are predominant affected by acute pancreatitis in our study sample contrary to other regions.

Author	Region	Sex Preponderance
Jha PK <i>et al.</i> ^[10]	Bihar	Female (65%)
Ahlawat <i>et al.</i> ^[11]	Haryana	Female (70%)
Present Study	Assam	Male (66%)

Alcohol is the common aetiology in our study sample while gall stone is common in other regions.

Author	Region	Common Aetiology
Kasim T <i>et al.</i> ^[12]	New Delhi	Gall Stones (67.7%)
Jha <i>et al.</i> ^[10]	Bihar	Gall Stones (63%)
Present Study	Assam	Alcohol (50%)

Age of incidence is more in younger demographic in our study sample compared to other region.

Author	Region	Age Group with increased incidence
Kalyani N <i>et al.</i> ^[13]	Guntur	41-60 years (40%)
Jha <i>et al.</i> ^[10]	Bihar	36-55 years (56.7%)
Present Study	Assam	15-35 years (50%)

Epigastric pain (84%) was the most common presenting symptom and dehydration (16%) was the most common sign in the study sample which is comparable with study done by N. Kalyani *et al.* ^[13].

Ethnic Assamese community is more affected by acute pancreatitis than other community and gallstone is the most common aetiology among them. This can be probably due to the fact that hemoglobinopathies can lead to increased incidence of gallstones and haemoglobin E (HbE) is mainly seen in ethnic groups in Assam especially Ahom, Chutia, Deori, Sonowal, Muttock, Koch ^[20]. It is a well-established fact that the incidence of HbE gene in the North Eastern Indian is highest in the world ^[21].

Tea tribe community is the second and Mising community is the third most commonly involved community by acute pancreatitis. Alcohol is the most common cause of acute pancreatitis in both of these communities. The variation in aetiology among ethnicity distribution is likely arising due to common sociocultural habits of prevalence of higher alcohol intake in Tea tribe and Mising community ^[15, 16]. The preparation and use of alcoholic beverage is predominant and integral part of religious functions, festivals and rituals, in these communities, often leading to habituation and dependency ^[22].

Alcohol is the most common aetiology of acute pancreatitis among male and gallstone is the most common aetiology among female. This variation in aetiology and sex distribution is likely due to less prevalence of alcohol intake among women and higher incidence of gall stone among women. Similar results were found in study conducted by Thomson SR *et al.* ^[23], where alcoholic pancreatitis was more prevalent in men and younger patients.

The demographic shift of increased incidence of acute pancreatitis among the younger age group is due to increased prevalence of alcoholism and early start of alcohol intake among younger age group. This is due to percentage of drinking population age under 21 years has increased from 2% more than 14% in past 15 years. The average age of initiation has dropped from 19 years to 13 years ^[17]. This early initiation is maybe due to alcohol companies, advertisement agencies and movies targeting young individuals to attract lifelong consumers, by glorifying alcohol drinking in name of urbanization, western world trend and uber lifestyle.

Gall stone is the most prevalent aetiology among older age group and female.

Among 10% of the study population, no aetiology could be identified and thus were considered idiopathic, which is in true to the statement that no more than 20% patients should be idiopathic ^[14].

Severe acute pancreatitis was more predominant among male and alcohol is the most frequent cause of severe acute pancreatitis in study sample which is contrary to study by Jha *et al.* ^[10], which state gallstone as cause of severe acute pancreatitis. While some investigators have reported patients with alcoholic pancreatitis to have poorer prognosis in comparison to those with gallstone pancreatitis ^[24, 25, 26].

Severe acute pancreatitis was equally prevalent across all communities and among all age group in this study and no predilection was found.

Among the districts Jorhat has the highest incidence (50%) followed by Golaghat (32%), Majuli (6%) and Sivasagar (4%). This disparity can be probably be attributed to the fact that as most of the acute pancreatitis' cases are mild, and are managed in secondary health institutes in neighbouring districts and only the moderate to severe cases are referred to our tertiary care centre, while all the cases encountered in Jorhat are referred to Jorhat Medical College and Hospital as it is the only major government health institute in the district.

Conclusion

Epigastric pain was the most common symptom, epigastric tenderness and dehydration were the most common signs in the studied patients. Acute pancreatitis is more prevalent in males than females in our region. Alcohol is the most common aetiology followed by gallstones in this region. Among male, alcohol is overall the most common aetiological factor. Alcohol is the most common aetiology among Tea-tribe and Mising community among female, gallstone is the most common aetiological factor. Gallstone is also the most common aetiology in ethnic Assamese communities. Overall Ethnic Assamese community were more commonly affected by acute pancreatitis followed by Tea-tribe and Mising. Acute pancreatitis has increased incidence in younger demographic. Alcoholic pancreatitis was found more in younger age group while gallstone pancreatitis was more in older age group. Acute pancreatitis has increased incidence among younger age due to early initiation of alcohol intake among youths and common prevalence of alcohol intake as sociocultural, religious and behavioural entity in tribal population leading to habituation and dependency. The detailed study of the different type of local alcoholic beverages and the raw materials and ingredients used in the making process, needs to be done to find out if, any particular type of beverage or ingredient is the risk factor for causing acute pancreatitis in this part of the country. There is striking difference of the aetiological factor among studied communities, but this study is uni-centric and therefore may not be representative in a wider context. Thus, a larger sample size and preferably a multi-centre study should be conducted for better and larger representation and inclusion of other ethnicities. Gender, age group and ethnicity are important determinants in aetiology, incidence and severity of acute pancreatitis in this region. Further studies may explain environmental and genetic interactions modifying disease development and its outcome.

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