

## Original Research Article

# A clinical study on epidemiology and etiological factors of acute pancreatitis-hospital based study in South India

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## ABSTRACT

**Background:** Acute pancreatitis is an important cause of acute abdomen with high morbidity and mortality. This study aimed to evaluate the epidemiology and etiological factors of acute pancreatitis in a tertiary care hospital in South India.

**Methods:** This retrospective study was carried among 70 patients. Data was collected and analysis done based on age, gender, etiology and severity of acute pancreatitis.

**Results:** Males were found more commonly affected than females in the ratio (M:F) of 5:1. Mean age of the study group was 37.2 years and maximum incidence was seen in the age group of 31 to 40 years. Overall alcohol was the most common etiological factor followed by idiopathic cause and gall stone disease.

**Conclusions:** Males were more commonly affected than females with acute pancreatitis. Alcohol and gall stones were the leading cause of acute pancreatitis in males and females respectively. Alcohol was the most common cause in this geographical location.

**Keywords:** Acute pancreatitis, Gall stone, Alcohol, Idiopathic

## INTRODUCTION

Acute pancreatitis is an important cause of acute abdomen with high morbidity and mortality. The disease severity spectrum varies from mild and self-limiting to severe and fatal disease.<sup>1</sup> About one fourth to one third of acute severe pancreatitis patients die from disease, having mortality rate of 2 to 10%.<sup>2</sup> A study in Scotland showed one fourth of deaths occur within 24 hours of admission.<sup>3</sup> After the second week of the disease, mortality is mainly due to pancreatic necrosis, infection and associated multiorgan failure.<sup>4</sup>

The etiological factors of acute pancreatitis are gallstones, alcohol, trauma, infections (viral, parasitic), acquired immunodeficiency disorders, drugs (azathioprine, mercaptopurine), hyperlipidemia,

hypercalcemia, idiopathic, post procedure (ERCP), post-surgeries like splenectomy, bile duct procedures, auto-immune and congenital anomalies like pancreas divisum.<sup>5,6</sup> Gallstones and alcohol account for nearly 70% of all cases of acute pancreatitis.<sup>7</sup> Biliary sludge accounted for approximately 67% of acute idiopathic pancreatitis.<sup>8</sup>

Pathophysiological mechanisms of acute pancreatitis include micro circulatory injury, leucocyte chemo-attraction, cytokines release, oxidative stress, pancreatic enzyme leakage, bacterial translocation.<sup>9</sup>

Patients who recover from acute pancreatitis often have recurrence of symptoms and most often develop chronic pancreatitis. The recurrence rate in alcohol-induced pancreatitis is nearly 50% and ranges from 32 to 61% in

gallstone pancreatitis if not treated adequately.<sup>10</sup> This indicated that etiological factors are important in determining recurrence. The etiological factors and age distribution varies considerably in western countries and in Asian countries.

## METHODS

This retrospective, descriptive study was done at Saveetha medical college and hospital in Tamil Nadu, South India. Case records of 70 patients who got admitted with first episode of acute pancreatitis in general surgery department during January 2019 and January 2020 were studied.

### Inclusion criteria

Patients with first episode of acute pancreatitis, irrespective of etiology was included in the study.

### Exclusion criteria

Patients with recurrent episodes and chronic pancreatitis were excluded.

Data regarding age, gender, etiology/risk factors, severity of disease were collected using pre-structured form. Correlation between etiology and gender, etiology and severity of acute pancreatitis were analyzed using relative risk or risk ratio (RR) and p value.

## RESULTS

Among the total 70 patients studied males constituted 84.3% (n=59) and females 15.7% (n=11) (Table 1). The mean age of the patients in this study group was 37.2±1.7 years and commonest age group found affected was 31 to 40 years (Table 2). The etiological factors were found to be alcohol, idiopathic, gallstones, trauma, post ERCP, hypercalcemia (Table 3).

**Table 1: Gender-wise distribution of acute pancreatitis.**

Gender	Number (n)	Percentage (%)
Male	59	84.3
Female	11	15.7
Total	70	100

In males, alcohol induced pancreatitis accounted for 59.3% (n=35) followed by idiopathic 20.3% (n=12), gallstones 11.9% (n=7), trauma 5.1% (n=3), post ERCP 3.4% (n=3.4%). In females, gallstones accounted for 63.6% (n=7) followed by idiopathic 27.3% (n=3) and hypercalcemia 9.1% (n=1) (Table 4). There was a significant correlation found between etiological factors and gender, alcohol induced in males (p=0.046,

significant) and gall stones in females (p=0.0007, significant) (Table 5).

**Table 2: Age-wise distribution of acute pancreatitis.**

Age group (in years)	Males (n)	Females(n)
Less than 20	4	0
21-30	15	2
31-40	27	6
41-50	8	3
Above 50	5	0
Total	59	11

**Table 3: Etiological distribution of acute pancreatitis.**

Etiology	Patients (n)	Percentage (%)
Alcohol	35	50
Gallstones	14	20
Idiopathic	15	21.4
Trauma	3	4.3
Post ERCP	2	2.9
Hypercalcemia	1	1.4
Total	70	100

**Table 4: Etiological distribution of acute pancreatitis in males and females.**

Etiology	Males	Females
	N (%)	N (%)
Alcohol	35 (59.3)	0
Gallstone	7 (11.9)	7 (63.6)
Idiopathic	12 (20.3)	3 (27.3)
Trauma	3 (5.1)	0
Post ERCP	2 (3.4)	0
Hypercalcemia	0	1 (9.1)
Total	59 (100)	11 (100)

53 out of 70 patients had acute mild pancreatitis of which 83.1% were males (n=44) and 16.9% were females (n=9). 17 out of 70 patients had acute severe pancreatitis of which 88.2% were males (n=15) and 11.8% were females (n=2) (Table 6).

Etiological factors distribution of acute mild pancreatitis was alcohol (49.1%), gall stones (22.6%), idiopathic (20.7%), trauma (1.9%), post ERCP (3.8%) and hypercalcemia (1.9%). In acute severe pancreatitis etiological distribution was alcohol (52.9%), gallstone (11.8%), idiopathic (23.5%) and trauma (11.8%). No significant correlation found between the etiological factors and severity of the disease in our study (Table 7).

**Table 5: Correlation between gender and etiology in acute pancreatitis.**

Etiology	Gender		RR (95% CI)	P value
	Male (n=59)	Female (n=11)		
Alcohol	35	0	14.2 (0.93-215.91)	0.046*
Gall stones	7	7	0.19 (0.08-0.42)	0.0007*
Idiopathic	12	3	0.75 (0.25-2.21)	0.59
Trauma	3	0	1.4 (0.07-25.38)	0.82
Post ERCP	2	0	1.0 (0.05-19.54)	1.0
Hypercalcemia	0	1	0.06 (0.002-1.54)	0.09

\*statistically significant ( $p < 0.05$ ); RR=relative risk; CI=confidence interval.

**Table 6: Gender-wise distribution of acute mild and severe pancreatitis.**

Gender	Acute mild pancreatitis	Acute severe pancreatitis
	N (%)	N (%)
Male	44 (75.7)	15 (88.2)
Female	9 (24.3)	2 (11.8)
Total (n=70)	53 (100)	17 (100)

**Table 7: Correlation between etiology and severity of acute pancreatitis.**

Etiology	Mild (n=53)	Severe (n=17)	RR (95% CI)	P value
	N (%)	N (%)		
Alcohol	26 (49.1)	9 (52.9)	0.92 (0.54-1.56)	0.77
Gallstones	12 (22.6)	2 (11.8)	1.92 (0.47-7.75)	0.35
Idiopathic	11 (20.7)	4 (23.5)	0.88 (0.32-2.41)	0.80
Trauma	1 (1.9)	2 (11.8)	0.16 (0.015-1.66)	0.124
Post ERCP	2 (3.8)	0	1.66 (0.08-33.11)	0.737
Hypercalcemia	1 (1.9)	0	1.0 (0.04-23.47)	1.0

( $P < 0.05$  is significant); RR=relative risk; CI=confidence interval.

## DISCUSSION

This study was done in a tertiary care hospital in South India. In our study, males (84.3%) were found more commonly affected with acute pancreatitis than females (15.7%) (M:F was 5:1). A study done on acute pancreatitis in five European countries by Gullo et al on 1,068 patients showed 692 (64.8%) were males and 376 (35.2%) were females.<sup>11</sup>

Mean age of the patients was 37.2 years and common age group affected was 31 to 40 years. This was similar to a study by Lankish et al which showed maximum incidence in the age group of 31-40 years.<sup>12</sup>

The most common etiological factor causing acute pancreatitis was alcohol followed by idiopathic, gallstones, trauma, post ERCP and hypercalcemia. This was in contrast to most of the previous studies. In the study by Gomez et al on 151 patients, gallstone was the most common etiology (77.4%).<sup>13</sup> In the study by Uomo et al biliary pancreatitis was seen in 69.3% and alcohol induced pancreatitis in 6.6%.<sup>14</sup> In the study in a tertiary care center in North India by Jha et al biliary pancreatitis was the most common seen in 63% followed by alcohol

in 27%, idiopathic in 6%.<sup>15</sup> Another study by Baig et al in Eastern India showed biliary pancreatitis was the most common form of acute pancreatitis.<sup>16</sup> This was significant as alcohol induced pancreatitis was more often associated with recurrence and chronicity.<sup>17</sup>

Alcohol was the commonest etiology in males and gallstones commonest etiology in females. In studies by Yadav et al and Chang et al alcohol induced pancreatitis was more common in middle aged males and gallstone pancreatitis was more common in females.<sup>18,19</sup>

No significant correlation found between etiological factors and severity of acute pancreatitis in our study. However, in a study done in Southern Taiwan by Chen et al there was a significant correlation found between etiological factor and severity of acute pancreatitis.<sup>20</sup>

### Limitations

Data was collected from patient case records and there was no patient interaction. Our sample size was limited to 70 and study carried out in a single center. We need large population studies, multicenter data to generalize our findings.

## CONCLUSION

In our study, we found males were more commonly affected with acute pancreatitis and alcohol was the most common etiological factor. The mean age of patients was 37.2 years. A significant number of idiopathic pancreatitis cases were noted in our study. We recommend a thorough evaluation of these kind of case to ascertain definitive etiology.

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