

## Clinical Study and Management of Acute Pancreatitis

Bhushan Shah<sup>1</sup>, Shivaratna Mahadik<sup>2</sup>, Rohan Videkar<sup>3</sup>, Birva Shah<sup>4</sup>

<sup>1</sup>Professor, <sup>2,3,4</sup>Resident, Department of General Surgery, Dr. DY Patil, Medical College and Research Centre, Pimpri, Pune, Maharashtra 411018, India.

### How to cite this article:

Bhushan Shah, Shivaratna Mahadik, Rohan Videkar et al. Clinical Study and Management of Acute Pancreatitis. New Indian J Surg. 2019;10(6):601-608.

### Abstract

*Introduction:* Pancreatitis is inflammatory process in which the pancreatic enzymes digest the gland. The pancreas sometimes heals without any impairment of function or any morphologic changes. This process is known as acute pancreatitis. Dealing with the clinical course of Acute Pancreatitis (AP) and management of acute pancreatitis are complicated by limited understanding of pathogenesis and multi-causality of the disease, uncertainties to predict outcome and a few effective treatment modalities. Thus, this study was undertaken at Dept of Gen Surgery, at DY Patil Medical College and Research Centre, Pimpri, Pune to study the the various etiological factors of causing pancreatitis, mode of onset of disease and to study the clinical presentations of pancreatitis and its management.

*Methodology:* Total 50 patients were included in this study since 2017 to 2019, who got admitted in Dept of Gen Surgery at Dypmch, Pimpri, Pune. Cases were studied according to clinical history and physical findings and investigations. Treatment was given according to the severity of pancreatitis with either conservative or surgical method or interventional radiological procedure. Patients were followed up for 6 months to look for any recurrence or complications.

*Results:* Total 72% pts were males, 28% were females in the study group. Alcohol was most common etiological factor 31 (62%) for pancreatitis followed by history of obstructive jaundice in 8 (16%).

Abdominal pain (100%) and vomiting (74%) were the most common modes of presentation. Ascitis (17) and acute pseudocysts (10) were common complications. As severity of pancreatitis increases blood sugar level increases due to reduced secretion of insulin from pancreas after inflammation and it was statistically highly significant (Spearman's rho = 0.638  $p = 0.00$ ), similarly severity of pancreatitis shows positive correlation with enzyme lipase due to release of lipase enzyme from pancreas after inflammation (Spearman's rho = 0.557  $p = 0.00$ ). 42 (84%) subjects were managed conservatively only with IV fluids, antibiotic, antisecretory drugs, (somatostatin analog) 3 (6%) with CT guided percutaneous drainage while remaining treated as per etiology of pancreatitis along with medical management.

*Conclusion:* Acute pancreatitis was a common cause of acute abdomen and alcohol and gallstones were most common causes. Once the final diagnosis is made, along with clinical knowledge one should simultaneously concentrate on laboratory or imaging investigation to find out the underlying etiology and managing the condition by predicting its complications. The management of acute pancreatitis is mostly supportive. Early enteral nutrition in a course of disease modifies the inflammatory response and improves patient outcome by reducing infective complications of the disease. Antibiotics should be used cautiously as prophylactic antibiotics might not be beneficial in preventing infective complications of acute pancreatitis.

**Keywords:** Pancreatitis; Enzymes; Acute Pancreatitis (AP).

---

**Corresponding Author:** Shivaratna Mahadik, Resident, Department of General Surgery, Dr. DY Patil, Medical College and Research Centre, Pimpri, Pune, Maharashtra 411018, India.

E-mail: [shivaratna91@gmail.com](mailto:shivaratna91@gmail.com)

Received on 19.10.2019, Accepted on 28.11.2019

### Introduction

The name 'pancreas' is derived from the Greek 'pan' (all) and 'kreas' (flesh).<sup>1</sup> In response to a meal, the pancreas secretes digestive enzymes,

in an alkaline (pH 8.4) bicarbonate-rich fluid. It also produces several important hormones including insulin, glucagon, somatostatin and pancreatic polypeptide.

In adults the pancreas weighs about 75–100 gms and 15–20 cm long. Pancreas is sealed in the retroperitoneum. The head of the pancreas is to right side and lies within the “C” curve of the duodenum at the second vertebral level (L2). Neck of the pancreas lies over the portal vein. The tip of the pancreas extends across the abdominal cavity almost to the spleen. The body and tail of the pancreas lie just anterior to the splenic artery and vein. The neck of the pancreas overlies the body of L-1 and L-2 vertebrae and blunt antero posterior trauma can compress the neck against the spine.

Acute Pancreatitis (AP) is an abrupt pancreatic gland inflammation, Caused by gallstone, alcohol consumption, infection or injury. Gallstones are the single most common cause of acute pancreatitis<sup>2</sup> followed by alcohol; these two constitute 75% of total cases. It can be a single event; it can be recurrent, or it can progress to chronic pancreatitis.

Gallstones are the single most common cause of acute pancreatitis followed by alcohol; these two constitute 75% of total cases. It can be a single event; it can be recurrent, or it can progress to chronic pancreatitis.

Clinical studies and experimental new data have led to considerable progress in understanding the patho physiological events of the early period of human AP, but the underlying processes leading to acinus cell necrosis and the propagation of the necrotizing inflammation by impaired microcirculation of pancreatic tissue compartments in the initial 48–72h, are still unknown to a large extent. Hence, management of human AP has been empiric and conflicting opinions are still present regarding medical and surgical management concept.<sup>3</sup>

It cannot be too strongly emphasized that the primary treatment of acute pancreatitis is conservative only, but it is the Pandora’s box of manifestations with its inherent complications, and then surgery comes into play.

Mild acute pancreatitis characterized is by minimal or no organ dysfunction & early, uncomplicated recovery while in severe acute pancreatitis there is major organ failure for more than 48 hours. CT scan is required to differentiate mild from severe necrotic acute pancreatitis. Severity of pancreatitis is assessed by APACHE II, Balthazar computed tomography severity index (CTSI), organ failure or BISAP score, ranson’s score.

It is treated with conservative medical management like pain relief, fluid replacement, nutritional support or surgical management includes drainage, debridement or rarely necrosectomy or pancreatectomy. 25% of patients having acute pancreatitis develops Severe Acute Pancreatitis (SAP) and the mortality rate in SAP is approximately 2–10%.<sup>4</sup>

So, the study was undertaken to study the common aetiology, various modes of clinical presentations, and management of acute pancreatitis in DY Patil Medical College and Research Centre, Pimpri, Pune.

### **Aims**

“To study various modes of presentation and management of acute pancreatitis.”

### **Objectives**

1. To study the various modes of clinical presentation and etiology of acute pancreatitis.
2. To evaluate various investigation which confirm acute pancreatitis.
3. To evaluate results of medical and surgical management in acute pancreatitis.
4. To evaluate role of surgery/interventional radiology in management of acute pancreatitis.

### **Materials and Methods**

It is a prospective cohort study conducted at Dypmch, Pimpri, Pune From 2017 to 2019. Sample size of fifty patients was taken. Patients of acute pancreatitis getting admitted under Dept of General Surgery were included in the study. Sampling unit was individual. Convenient Sampling technique was used. The purpose of the study explained to patients, Informed written consent were taken prior to actual participation of patient into the study. Institute Ethical Committee approval was taken prior to the study.

All patients were investigated for confirmation of the diagnosis and evaluated for etiology and response to different types of treatment modalities (medical or surgical/radiological interventional procedure) during the period. These patients with a history of severe pain radiating to back, vomiting, abdominal distension, dehydration with history of

alcoholism or with history of Biliary calculus, or with history of obstructive jaundice and a diagnosis of acute pancreatitis were selected consequently as and when they presented with the inclusion and exclusion criteria.

These patients were subjected to investigation for confirmation of the diagnosis or to exclude other causes of acute abdomen, which included total blood counts. Sr amylase, sr lipase, sr calcium, LFT, RFT and X-ray abdomen, USG abdomen and pelvis and CECT abdomen and pelvis. These patients were subjected to medical treatment which includes fluid replacement, NPO, higher antibiotics, oxygen inhalation, other supportive treatment and radiological interventional or surgical treatment. Patients were followed up for a period of 6 months to look for recurrence or complications developing after discharge.

**Inclusion Criteria**

- Patient more than 12 years of age diagnosed as case of acute pancreatitis.

**Exclusion criteria**

- Acute pancreatitis due to pancreatic carcinoma;
- Traumatic pancreatitis;
- Acute pancreatitis with pseudocyst;
- Not willing to give consent for inclusion in study.

**Observations and Results**

**1. Age and gender wise distribution among study group**

Mean age of study sample was 32.98 years with standard deviation of 7.01 years, with the highest 55 years and lowest 22 years. There were 18 (72%) males and 7 (28%) females in the study. 22 (44%) samples were from 21–30 years age group followed by 21 (42%) subjects in 31–40 years age group, (Fig. 1).

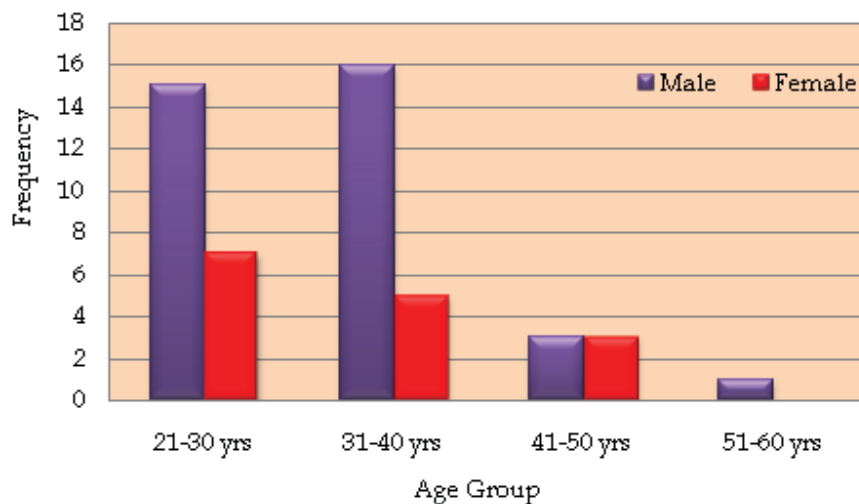


Fig. 1: Age-gender wise distribution

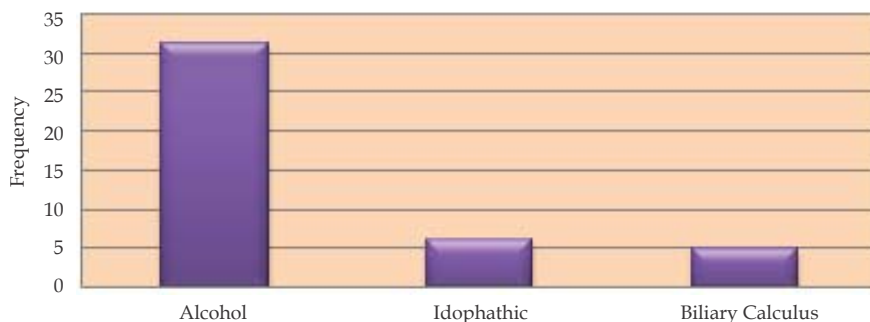


Fig. 2: Etiology of pancreatitis

## 2. Complaints among study Group

Abdominal pain was most common complaint and it was present in all 50 (100%) subjects followed by vomiting in 37 (74%) subjects, abdominal pain radiating to back in 29 (58%) subject. Other complaints like fever, breathlessness were also present among study samples.

## 3. Etiology of pancreatitis among study group

Alcohol was most common etiological factor of pancreatitis and it was present in all 31 (62%) subjects. Biliary calculus was present in 5 (10%) subject. Few subjects were having combined etiological factors. while few were having idiopathic etiology (12%). Few had a history of obstructive jaundice i.e. in 8 (16%) subjects, (Fig. 2).

## 4. Clinical features among study group

Abdominal distension was most common clinical feature and it was present in 25 (50%) of subjects followed by icterus in 15 (30%) subjects, hepatomegaly in 12 (24%) of subjects. Other features like epigastric mass, anuria were also present, (Fig. 3).

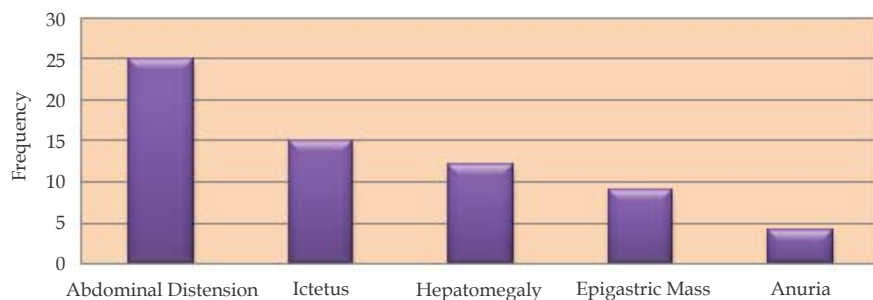


Fig. 3: Clinical features

Table 1: Descriptive statistics of BSL according to Ranson's Score

Ranson's Score	Samples	Mean	Std Deviation	Std Error	Minimum	Maximum
0	25	132.36	29.42	5.88	87	190
1	16	176.12	60.32	15.08	90	320
2	3	209.00	47.15	27.22	167	260
4	2	251.50	89.80	63.50	188	315
5	4	294.25	42.99	21.50	248	352
Total	50	168.68	65.30	9.24	87	352

Correlations			BSL	Ranson's Score
Spearman's rho	BSL	Correlation Co-efficient	1.000	0.638
		Sig (2-tailed)	—	0.00
Ranson's Score	Ranson's Score	Correlation Co-efficient	0.638	1.000
		Sig (2-tailed)	0.00	—

## 5. Severity of pancreatitis and blood sugar level (BSL), (Table 1).

Above statistics shows that there was positive correlation between severity of pancreatitis (Ranson's Score) and random blood sugar level, it means as severity of pancreatitis (Ranson's Score) increases blood sugar level increases (it was due to reduced secretion of insulin from pancreas after inflammation) and it was statistically highly significant (Spearman's rho = 0.638  $p = 0.00$ ), (Fig. 4 and Table 2,3).

## 6. Severity of pancreatitis and amylase/lipase enzymes

Above statistics shows that there was positive correlation between severity of pancreatitis (Ranson's Score) and amylase enzyme level, it means as severity of pancreatitis (Ranson's Score) increases serum amylase level increases but it was statistically not significant (Spearman's rho = 0.220  $p = 0.125$ ).

There was positive correlation between severity of pancreatitis (Ranson's Score) and lipase enzyme level, it means as severity of pancreatitis (Ranson's Score) increases serum lipase level

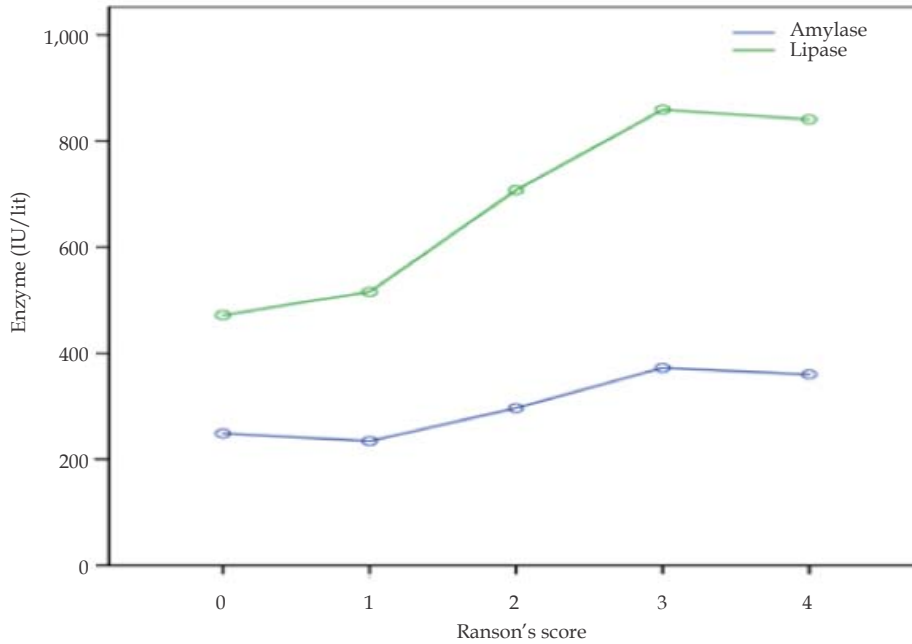


Fig. 4: Ranson's Score

Table 2: Descriptive statistics of serum amylase according to Ranson's Score

Ranson's Score	Samples	Mean	Std Deviation	Std Error	Minimum	Maximum
0	25	248.76	85.43	17.09	116	399
1	16	234.38	72.30	18.07	170	459
2	3	296.67	12.42	7.17	289	311
4	2	372.50	84.15	59.50	313	432
5	4	360.00	77.65	38.83	267	456
Total	50	260.88	85.95	12.16	116	459

Correlations

				Amylase	Ranson's Score
Spearman's rho	Amylase	Correlation Co-efficient		1.000	0.220
		Sig (2-tailed)		-	0.125
	Ranson's Score	Correlation Co-efficient		0.220	1.000
		Sig (2-tailed)		0.125	-

Table 3: Descriptive statistics of serum lipase according to Ranson's Score

Ranson's Score	Samples	Mean	Std Deviation	Std Error	Minimum	Maximum
0	25	472.16	100.48	20.10	289	732
1	16	515.12	117.94	29.49	330	689
2	3	707.00	51.68	29.84	653	756
4	2	859.00	22.63	16.00	843	875
5	4	840.50	241.96	120.98	685	1200
Total	50	544.94	169.31	23.94	289	1200

Correlations

				Lipase	Ranson's Score
Spearman's rho	Lipase	Correlation Co-efficient		1.000	0.557
		Sig (2-tailed)		-	0.00
	Ranson's Score	Correlation Co-efficient		0.557	1.000
		Sig (2-tailed)		0.00	-

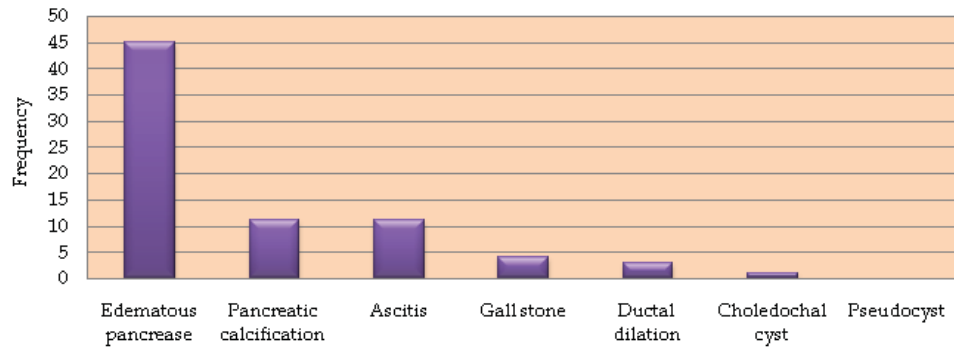


Fig. 5: USG abdomen pelvis

Table 4: Management of acute pancreatitis

Management of pancreatitis		Frequency	Percentage
Only conservative management	IV fluid, Antibiotics, Analgesic, Antisecretory drugs	42	84
Interventional radiological procedure	CT guided percutaneous drainage	3	6
Surgery	Open necrosectomy	1	2
	ERCP	1	2
	ERCP and Lap cholecystectomy	1	2
	Hepaticojejunostomy	1	2
	Lap cholecystectomy	1	2
Total		50	100

increases (it was due to release of lipase enzyme from pancreas after inflammation) and it was statistically highly significant (Spearman's rho = 0.557  $p = 0.00$ ).

### 7. Features of ultrasonography abdomen pelvis

On ultrasonography abdomen edematous pancreas (45), pancreatic calcification (11), ductal dilatation (3), ascitis (11), gall stones (4), CBD stone (2) and choledochal cyst (1) were seen among study samples, (Fig. 5).

### 8. Management of acute pancreatitis

Out of 50, 42 (84%) subjects managed conservatively only with IV fluids, antibiotic, antisecretory drugs, two among them required inotropic drug also. CT guided percutaneous drainage was performed in 3 (6%) subjects, out of which one subject was given inotropic drugs as well. 5 (10%) subjects were managed according to etiology of pancreatitis as per mentioned in below mentioned table. Those who were managed with interventional radiological procedure and surgery were also given conservative management as a supportive therapy, (Table 4).

### 9. Complications

32 subjects presented with complications along with pancreatitis, ascitis (17) was most common complication followed by acute pseudocyst (10). Pancreatic abscess and necrosis were also present, (Table 5).

Table 5: Complications

Complications	Frequency
Acute pseudocyst	10
Pancreatic necrosis	3
Pancreatic abscess	2
Pancreatic ascitis	17
Total	32

## Discussion

### 1. Age-gender Distribution

Mean age of study sample was 32.98 years with standard deviation of 7.01 years, 22 (44%) samples were from 21-30 years age group followed by 21 (42%) subjects in 31-40 years age group. Maximum numbers of patients were males (72%) as compared to females (28%) with ratio of 2.57:1. It seems pancreatitis is more prevalent in males similar to Gullo et al.<sup>5</sup> studied 1,068 patients in five

European countries, 692 (64.8%) were men and only 376 (35.2%).

## 2. Clinical presentation and complications

Abdominal pain was most common (mc) complaint and it was present in all 50 (100%) followed by vomiting (74%) which was similar to Negi N, Mokta J, Sharma B, et al.<sup>6</sup> (Abdominal pain 100%, vomiting 42.27%), this presentation correlates with studies by Mitchell S<sup>7</sup> and Rao BS, et al.<sup>8</sup> where abdominal pain was seen in 95% and 100% of cases respectively. 17 out of 32 subjects were having ascitis along with pancreatitis followed by acute pseudocyst (10), while 15 patients (13.6%) had pleural effusion, 9 patients (8.2%) had pseudo cyst in Vengadakrishnan K, Koushik AK.<sup>9</sup>

## 3. Etiology of acute pancreatitis

In this conducted study, alcohol was most common cause of pancreatitis seen in 62% patients followed by biliary calculus in 10%. Mukherjee D, Bhakta S, et al.<sup>10</sup>, Negi N, Mokta J, Sharma B, et al.<sup>6</sup>, Brendan Hermenigildo Dias, Anthony Prakash Rozario, et al.<sup>11</sup> also shows alcohol as most common etiology of pancreatitis.

## 4. Treatment of acute pancreatitis

Out of 50, 42 (84%) subjects managed conservatively only with IV fluids, antibiotic, antisecretory drugs, inotropic drug, 3 (6%) CT guided percutaneous drainage & 5 (10%) subjects were managed according to an etiology of pancreatitis. Open necrosectomy was performed in one subject which is less in proportion than 15 patients (13.6%) who underwent the open necrosectomy surgery & 3 patients (2.7%) underwent the laparoscopic necrosectomy out of 110 subjects in Vengadakrishnan K, Koushik AK.<sup>9</sup> Surgical management includes drainage, debridement or surgery according to etiology of pancreatitis.

## 5. Mortality

Two (4%) out of 50 subjects had mortality having severe pancreatitis, approximately similar death rate was observed in 2.1% (17 out of 805) Muthoka Mutinga, Adam Rosenbluth, et al.<sup>12</sup> Lower mortality rate was observed in acute pancreatitis because most of subjects were having mild pancreatitis and managed conservatively or required specific surgical intervention as per the etiology which includes cholecystectomy or ERCP or drainage of abscess.

## Conclusion

Acute pancreatitis was a common cause of acute abdomen in this study and alcohol and gallstones were most common causes. Adult males with mild to moderate pancreatitis were most common observed group among affected patients. Once the final diagnosis is made, along with clinical knowledge one should simultaneously concentrate on laboratory or imaging investigation to find out the underlying etiology and managing the condition by predicting its complications.

The management of acute pancreatitis is mostly supportive. There is still no exact consensus on the perfect type and regimen of fluid for resuscitation, but fluid therapy is associated with much better outcome among patients. Early enteral nutrition in a course of disease modifies the inflammatory response and improves patient outcome by reducing infective complications of the disease.

Antibiotics should be used cautiously as prophylactic antibiotics might not be beneficial in preventing infective complications of acute pancreatitis. Patients with mild form of acute pancreatitis due to gallstone should be considered undergoing a laparoscopic cholecystectomy at the time of admission, while those with severe gallstone pancreatitis with evidence of cholangitis or choledocholithiasis gets benefits from early ERCP intervention. Lower mortality rate was observed among patient mild to moderate pancreatitis due to self limiting nature of the disease while higher mortality among severe pancreatitis patients due to multi organ failure.

## References

1. Hamilton Bailey, Christopher JK, Bulstrode RJ, et al. 26<sup>th</sup> edition. The Pancreas. Chapter 64, Bailey and Love's Short.
2. Steinberg W, Tenner S. Acute pancreatitis. Engl J Med 1994;330(17):1198-210.
3. Tenner S, Baillie J, DeWitt J, et al. American College of Gastroenterology guideline: management of acute pancreatitis. Am J Gastroenterol. 2013 Sep;108(9):1400-15.
4. Surbatovic M and Radakovic S. Tumor necrosis factor- $\alpha$  levels early in severe acute pancreatitis: Is there predictive value regarding severity and outcome? J Clin Gastroenterol 2013;47:637-43.
5. Gullo L, Migliori M, Olah A. Acute pancreatitis in five European countries. Etiol Mortality Pancreas 2002;(24):223-27.

6. Negi N, Mokta J, Sharma B, et al. Clinical Profile and Outcome of Acute Pancreatitis: A hospital-based prospective observational study in Subhimalayan State. *J Assoc Physicians India* 2018 Mar;22:(3)66-24.
7. Mitchell S. Acute pancreatitis: Etiology, clinical presentation, diagnosis, and therapy. *Med Clin N Am* 2008;(92):889-923.
8. Rao S. Etiology, clinical profile, severity and outcome of acute pancreatitis in relation to bedside index for severity of acute pancreatitis BISAP and CT severity index (CTSI) scores. *Int J Med Res Health Sci* 2014;3(4):922-28.
9. Vengadkrishnan K, Koushik A K. A study of the clinical profile of acute pancreatitis and its correlation with severity indices. *Int J Health Sci (Qassim)*. 2015 Oct; 9(4): 410-417.
10. Mukherjee D, Bhakta S, Lahiry S, et al. Original article Demographic profile of Acute Pancreatitis in Eastern India: A Single Centre Experience. *Asian Journal of Medical Sciences* 2017 Nov-Dec;8(6):8-13. DOI:10.3126/ajms.v8i6.18282.
11. Brendan Hermenigildo Dias, Anthony Prakash Rozario, Santosh Antony Olakkengil, et al. Procalcitonin Strip Test as an independent predictor in Acute Pancreatitis. *Indian Journal of Surgery* 2015 Dec;77 (3):1012-17.
12. Muthoka Mutinga, Adam Rosenbluth, Scott M. et al. Does mortality occur early or late in Acute Pancreatitis? *International Journal of Pancreatology* 2000 Oct;28(2):91-95.