Research Paper

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A study of Acute Pancreatitis , Diagnostic Modalities and Newer Guidelines

Medical Science

KEYWORDS : Acute pancreatitis,Newer Guidelines

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ABSTRACT

BACKGROUND : Acute pancreatitis is a common and challenging disease that can develop both local and systemic complications which ranges from mild self limiting inflammation of pancreas to critical disease characterized by infected pancreatic necrosis, multiple organ failure, and a high risk of mortality

AIMS AND OBJECTIVES

1. To study etiological factors and presentation of Acute Pancreatitis

2. To assess various investigations for diagnosis of acute pancreatitis and its complications.

3. Study of Newer Guidelines

MATERIAL AND METHODOLOGY

The analytical study of 25 cases of Acute Pancreatitis was done during April 2010 to December 2012 in patients of Sheth V.S. General Hospital ,Ahmedabad,Gujarat, India.

OBSERVATION AND DISCUSSSION

In our analytical study of 25 patients of acute pancreatitis, there is male preponderance, with maximum 18 patients (72%) are below 45 years of age. Alcoholism ranks first as the etiological factor 48% followed by 20% biliary tract disease. Among the male, alcoholism is the most common etiological factor, because addiction of it is more common in males, while biliary tract disease is the most common factor in female. Abdominal pain, vomiting, fever, abdominal distention are its common clinical symptoms

RESULTS

• Most of cases of acute pancreatitis (20 cases in our study)had self limiting course which were the cases of mild acute pancreatitis. Where as in 5 cases of acute severe pancreatitis with complication we had to explore

• Newer guidelines has been presented in 2013 by American College of Gastroenterology which will help in better management of patients of Acute Pancreatitis

INTRODUCTION

Acute pancreatitis (AP) is an acute inflammatory condition of the pancreas that may extend to local and distant extrapancreatic tissues. The American College of Gastroenterology (ACG) practice guidelines provide acceptable terminology for the classification of AP and its complications.[2]

Acute Pancreatitis is broadly classified (the Atlanta classification) as mild and severe:

• **Mild AP** is often referred to as interstitial pancreatitis, based on its radiographic appearance.

• **Severe AP** implies the presence of organ failure, local complications, or pancreatic necrosis. Interstitial pancreatitis implies preservation of pancreatic blood supply; necrosis suggests the disruption of pancreatic blood supply with resulting ischemia. Eighty percent of cases of AP are interstitial and mild; the remaining 20% are necrotizing and severe.

The severity of AP can be predicted based upon clinically laboratory and radiological risk factors various severity grading system and serum markers. Some of this can be perform on admission to assist in triage of patient while others can be obtained during 1st 48 -72 hours or later.

When acute pancreatitis occurs on two or more occasions (evidenced by elevation of the serum pancreatic enzymes), it is classified as acute recurrent pancreatitis. In some cases, acute recurrent pancreatitis progresses to chronic pancreatitis, implying the presence of parenchymal fibrosis and loss of glandular function.

PATHOPHYSIOLOGY OF ACUTE PANCREATITIS:

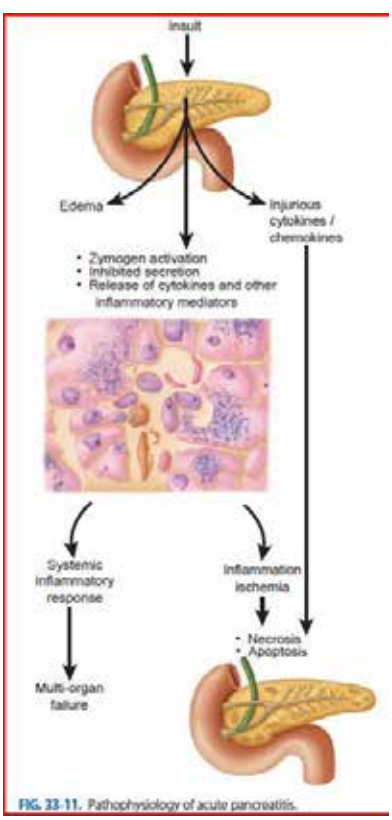


FIG. 33-11. Pathophysiology of acute pancreatitis.

ETIOLOGIES OF ACUTE PANCREATITIS
ALCOHOL
BILIARY TRACT DISEASE
HYPERLIPIDEMIA
HEREDITARY
HYPERCALCEMIA
TRAUMA • EXTERNAL • SURGICAL • ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY
ISCHEMIA • HYPOPERFUSION • ATHEROEMBOLIC • VASCULITIS
PANCREATIC DUCT OBSTRUCTION • NEOPLASMS • PANCREAS DIVISUM • AMPULLARY AND DUODENAL LESIONS
INFECTIONS
VENOM
DRUGS
IDIOPATHIC

SCORING SYSTEMS USED IN ACUTE PANCREATITIS

Balthazar scoring

Balthazar Scoring for the Grading of` Acute Pancreatitis[12]

The CT Severity Score is the sum of the CT Grade and Necrosis Grade Scores.

CT Grade Score

CT Grade	Appearance on CT	CT Grade Points
Grade A	Normal CT	0 points
Grade B	Focal or diffuse enlargement of the pancreas	1 point
Grade C	peripancreatic inflammatory change	2 points
Grade D	Fluid collection in a single location	3 points
Grade E	Two or more fluid collections and / or gas bubbles in or adjacent to pancreas	4 points

Necrosis score

Necrosis Percentage	Points
No necrosis	0 points
0 to 30% necrosis	2 points
30 to 50% necrosis	4 points
Over 50% necrosis	6 point

PROGNOSTIC ASSESSMENT OF ACUTE PANCREATITIS

Scoring system to predict the severity of acute pancreatitis. Both the system, is classified as sever when 3 or more factors present.

Ranson's criteria[14]	
At admission or diagnosis:	
Age	> 55 years
White blood cell count	> 16,000 per mm^3 (16.0×10^9 per L)
Blood glucose	> 200 mg per dL (11.1 mmol per L)
Serum lactate dehydrogenase	> 350 U per L
AST	> 250 U per L
Hematocrit decrease	> 10 percent
Blood urea nitrogen increase	> 5 mg per dL (1.8 mmol per L)
Serum calcium	< 8 mg per dL (2 mmol per L)
Base deficit	> 4 mmol per L (4 mEq per L)
Fluid sequestration	> 6,000 Ml
PaO_2	< 60 mm Hg

Glasgow scoring system	
Age	> 55 years
White blood cell count	> 15,000 per mm^3 (15.0×10^9 per L)
Blood glucose	> 180 mg per dL (10 mmol per L) in patients without diabetes
Serum lactate dehydrogenase	> 600 U per L
Serum AST or ALT	> 100 U per L
Serum calcium	< 8 mg per Dl
PaO_2	< 60 mm Hg
Serum albumin	< 3.2 g per dL (32 g per L)
Serum urea	> 45 mg per dL (16.0 mmol per L)

APACHE SCORE

The acute Physiology and chronic health evaluation II (APACHE II) system is as accurate at 24 hours as other systems at 48 hours , and it is now therefore regarded as perhaps the optimal scoring system to access disease severity in pancreatitis .Twelve physiologic variables are measured and weighed based on their degree of abnormaliy; temperature, mean arterial pressure, heart rate, respiratory rate, arterial oxygen tension ,arterial PH, serum sodium, serum potassium, serum creatinine, hematocrit, white blood cell count and Glasgow coma scale. Further points are added for increased age and chronic organ dysfunction. The newer APACHE II system uses an additional five physiologic variables to improve accuracy. although the newer system may be less useful than the APACHE II score in distinguishing mild from severe pancreatitis.

A recent modification of the APACHE II system that includes a clinical assessment of obesity (APACHE-O score) has been suggested to further improve predictive accuracy, with positive predictive value of 74%.

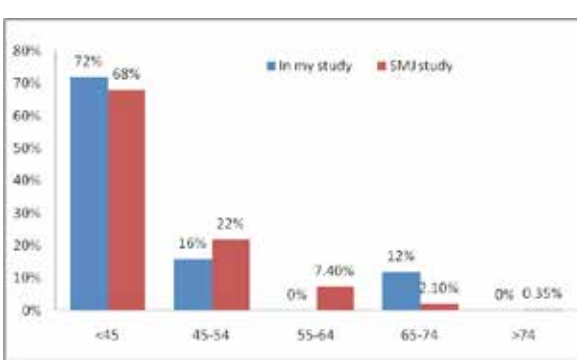
OBSERVATION AND DISCUSSION

The present study is an analysis of 25 cases of acute pancreatitis. Various etiological factors, age and sex, incidence, clinical presentation, laboratory determination, morbidity, mortality and complications are studied in detail. Particular emphasis is laid on the management of acute attack and its complications.

This study is being compare with "Singapore Med Journal,2002 Vol 43(6)284-288" [15] (SMJ) and Scandinavian Journal of Surgery 93: 29–33, 2004[16] study done in norway. This case study is based on ethnic variation in etiologic and clinical out come of acute pancreatitis.

1. AGE

Age	No. of cases	In our study	SMJ study
<45	18	72%	68%
45-54	4	16%	22%
55-64	0	0%	7.4%
65-74	3	12%	2.1%
>74	0	0%	0.35%



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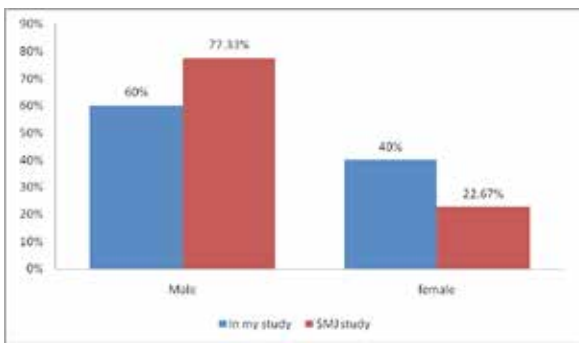
Minimum age in our study is 12 years and maximum age is 70 years. maximum number of patient is below 45 years of age that is 18 (72%) patient.

2. SEX

Sex	No of cases	In our study	SMJ study
Male	15	60 %	77.33 %
female	10	40 %	22.67 %

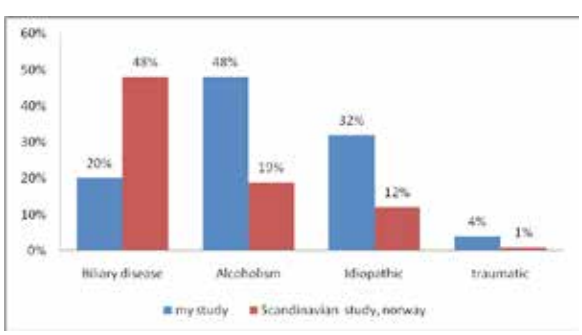
In our study, 60 % male patient developed acute pancreatitis and 40 % of female. in selected case study, acute pancreatitis occurs in 77.33% in male patient and 42.42% in female. It can be concluded that males are affected more often by acute pancreatitis than females.



3. ETIOLOGICAL FACTORS

Etiology	No. of cases		In our study (%)	Scandinavian study, norway
	Male	Female		
Biliary disease	1	4	20 %	48%
Alcoholism	12	0	48 %	19%
Idiopathic	3	5	32 %	12%
Traumatic	1	0	04 %	1%

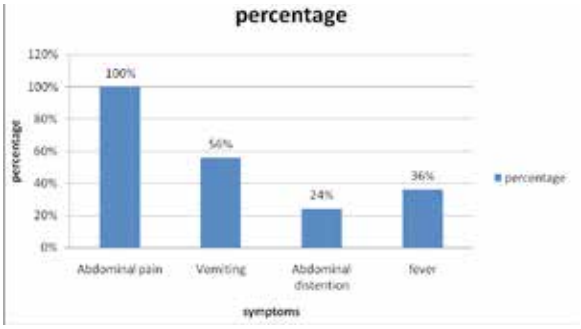
Study of etiological factors -comparision



In our study, alcohol identified as the most important etiologic factor associated with pancreatitis. Also incidence of alcohol association with acute pancreatitis was significantly increased in male, while gall stone pancreatitis was predominantly a disease of the female. Occurence of percentage of alcoholic pancreatitis in my study is 48%, correlated with that of Norway study is 19%. While biliary disease as etiological factor in my study is 20% and in Norway study is 48%.

4. SYMPTOMS

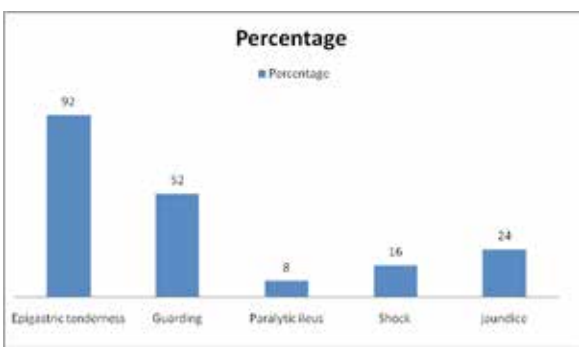
Symptoms	No.of cases	Percentage (%)
Abdominal pain	25	100
Vomiting	14	56
Abdominal distention	6	24
fever	9	36



Abdominal pain and vomiting were the most consistent symptoms in my patient. In Maingot's Abdominal operations-"Acute Pancreatitis", it is stated that abdominal pain was present in 85-100%.

5. SIGNS

Signs	No. of cases	Percentage (%)
Epigastric tenderness	23	92
Guarding	13	52
Paralytic ileus	2	8
Shock	3	12
Jaundice	6	24

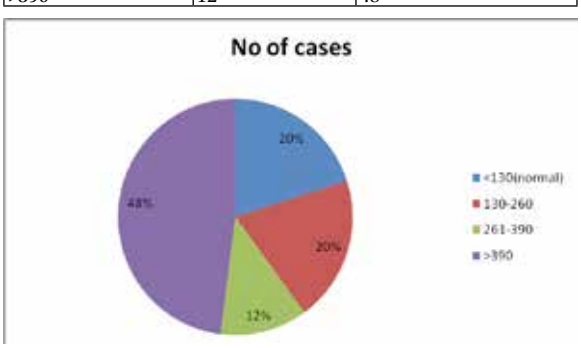


Epigastric tenderness is present in 92% of cases. guarding /rigidity are present in 52% of patient. 24% patient show jaundice as a sign of acute pancreatitis.

INVESTIGATION

1. SERUM AMYLASE

	No. of cases	Percentage (%)
<130(normal)	5	20
130-260	5	20
261-390	3	12
>390	12	48

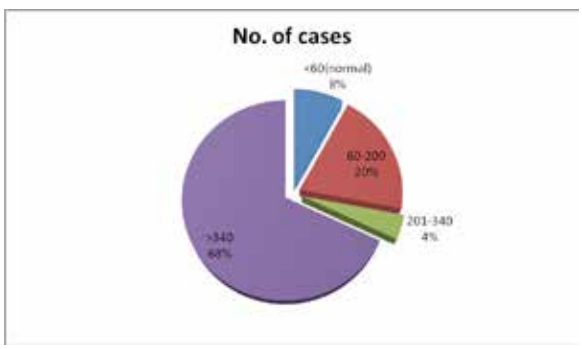


Normal value in our laboratory is upto 130 unit/L in my study diagnosis of pancreatitis is made by the clinical presentation or other modalities like Ultrasonography.20 (80%) patient show hyperamylasemia, while 5 (20%) patient of my cases had normoa-

mylasemia, and 12 (44%) patient have serum amylase level more than three times the normal value. Thus hyperamylasemia is a highly sensitive but not specific biochemichal indicator of the disease.values three times above normal are almost specific. In my study, 12(48%) patient have serum amylase level more than three times the normal value.

2. SERUM LIPASE

Values	No. of cases	Percentage (%)
<60(normal)	2	8
60-200	5	20
201-340	1	4
>340	17	68



Serum lipase is only secreted by the pancreas and thus better specificity and sensitivity. In acute pancreatitis , serum lipase level may be elevated more consistently and life than serum amylase. Normal serum lipase value is 60 units/L. In present study. In my study, 92% patient show raised lipase level. Among them, 17(68%) patient have three fold than the normal value.

3. SERUM BILIRUBIN

	No of cases	Percentage (%)
Normal	19	76
Raised	6	24

Most of the cases of hyperbilirubinemia were those associated with biliary tract disease.

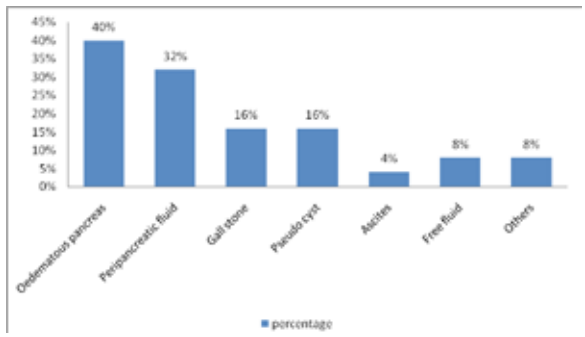
4. SERUM CALCIUM

	No. of cases	Percentage (%)
Normal	9	50
Low	9	50

Patient with hypocalcaemia had more severe disease than normocalcaemic patient. Thus serum calcium is a good prognostic indicator of acute pancreatitis.

5. ABDOMINAL ULTRASOUND

Findings	No of cases	Percentage (%)
Oedematous pancreas	12	48
Peripancreatic fluid	9	36
Gall stone	5	20
Pseudo cyst	5	20
Ascites	2	8
Free fluid	2	8
Others	2	8



Ultrasonography of abdomen is done in all 25 cases. Maximum number of the patient (40%) showing pancreatic oedema as charecteric of acute pancreatitis.USG is the cost effective and reliable investigation for diagnosis of acute pancreatitis as well as its complication.

6. COMPUTED TOMOGRAPHY OF ABDOMEN

Abdominal computed tomography was done in patient. It revealed all the features of acute pancreatitis and also, complications like necrotizing pancreatitis, pseudocyst. Its greatest advantage is its utility when retroperitoneum cannot be visualized on ultrasonography due to bowel gas.

7. SEVERITY

Severity	Our study	Scandinavian study, Norway
mild	52%	80%
severe	48%	20%

In our study 48% of cases developed severe pancreatitis and 4% mortality. While in Scandinavian Journal of Surgery, Norway study 20 % developed severe pancreatitis with mortality 3%.

8. COMPLICATION AND ITS MANAGEMENT

Complication	No of cases	Management	
		conservative	Surgical
Sever necrotizing pancreatitis	3	2	1
Pseudocyst	7	3	4
Acute fluid collection	3	3	0

The most common complication that developed after an acute attack of pancreatitis was a pseudocyst (7 patient-28%). 4 patients underwent surgery.

9.OUTCOME OF ACUTE PANCREATITIS

Outcome	No. Of cases
Recovered	18
Recovered with complication	5
Expired	2

In my study 72% recovered, 20 % recovered with complication and 8% mortality .In Norway study mortality is 3%.

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Discussion on Newer Guideline :
AMERICAN COLLEGE OF GASTROENTEROLOGY GUIDELINE 2013 : MANAGEMENT OF ACUTE PANCREATITIS

Summary of recommendations
Diagnosis
1. The diagnosis of AP is most often established by the presence of two of the three following criteria: (i) abdominal pain consistent with the disease,

(ii) serum amylase and / or lipase greater than three times the upper limit of normal, and / or (iii) characteristic fi ndings from abdominal imaging
(strong recommendation, moderate quality of evidence).

2. Contrast-enhanced computed tomographic (CECT) and / or magnetic resonance imaging (MRI) of the pancreas should be reserved for patients in

whom the diagnosis is unclear or who fail to improve clinically within the fi rst 48 – 72 h after hospital admission (strong recommendation, low quality of evidence).

Etiology
3. Transabdominal ultrasound should be performed in all patients with acute pancreatitis (strong recommendation, low quality of evidence).

4. In the absence of gallstones and / or history of signifi cant history of alcohol use, a serum triglyceride should be obtained and considered the etiology if > 1,000 mg / dl (conditional recommendation, moderate quality of evidence).

5. In a patient older than 40 years, a pancreatic tumor should be considered as a possible cause of acute pancreatitis (conditional recommendation, low quality of evidence).

6. Endoscopic investigation in patients with acute idiopathic pancreatitis should be limited, as the risks and benefi ts of investigation in these patients are

unclear (conditional recommendation, low quality of evidence).

7. Patients with idiopathic pancreatitis should be referred to centers of expertise (conditional recommendation, low quality of evidence).

8. Genetic testing may be considered in young patients (< 30 years old) if no cause is evident and a family history of pancreatic disease is present
(conditional recommendation, low quality of evidence).

Initial assessment and risk stratification
9. Hemodynamic status should be assessed immediately upon presentation and resuscitative measures begun as needed (strong recommendation, moderate quality of evidence).

10. Risk assessment should be performed to stratify patients into higher- and lower-risk categories to assist triage, such as admission to an intensive care setting (conditional recommendation, moderate quality of evidence).

11. Patients with organ failure should be admitted to an intensive care unit or intermediary care setting whenever possible (strong recommendation, low quality of evidence).

Definitions of severity in acute pancreatitis: comparison of Atlanta and recent revision

Atlanta criteria (1993)	**Atlanta Revision (2013)**
Mild acute pancreatitis	**Mild acute pancreatitis**
Absence of organ failure	Absence of organ failure
Absence of local complications	Absence of local complications
Severe acute pancreatitis	Moderately severe acute pancreatitis
1. Local complications **AND / OR**	1. Local complications **AND / OR**
2. Organ failure	2. Transient organ failure (< 48 h)
GI bleeding (> 500 cc/24 hr)	**Severe acute pancreatitis**
Shock – SBP _ 90 mm Hg	Persistent organ failure > 48 h a
PaO 2 _ 60 %	
Creatinine _ 2 mg / dl	

GI, gastrointestinal; SBP, systolic blood pressure.

a Persistent organ failure is now defined by a Modified Marshal Score (6,8)

Initial management
12. Aggressive hydration, defi ned as 250-500 ml per hour of isotonic crystalloid solution should be provided to all patients, unless cardiovascular

and / or renal comorbidites exist. Early aggressive intravenous hydration is most benefi cial the fi rst 12 – 24 h, and may have little benefi t beyond (strong recommendation, moderate quality of evidence).

13. In a patient with severe volume depletion, manifest as hypotension and tachycardia, more rapid repletion (bolus) may be needed (conditional recommendation, moderate quality of evidence).

14. Lactated Ringer's solution may be the preferred isotonic crystalloid replacement fluid (conditional recommendation, moderate quality of evidence).

15. Fluid requirements should be reassessed at frequent intervals within 6 h of admission and for the next 24 – 48 h. The goal of aggressive hydration

should be to decrease the blood urea nitrogen (strong recommendation, moderate quality of evidence).

ERCP in acute pancreatitis
16. Patients with acute pancreatitis and concurrent acute cholangitis should undergo ERCP within 24 h of admission (strong recommendation, moderate quality of evidence).

17. ERCP is not needed in most patients with gallstone pancreatitis who lack laboratory or clinical evidence of ongoing biliary obstruction (strong recommendation, low quality of evidence).

18. In the absence of cholangitis and / or jaundice, MRCP or endoscopic ultrasound (EUS) rather than diagnostic ERCP should be used to screen for choledocholithiasis if highly suspected (conditional recommendation, low quality of evidence).

19. Pancreatic duct stents and / or postprocedure rectal nonsteroidal anti-infl ammatory drug (NSAID) suppositories should be utilized to prevent severe post-ERCP pancreatitis in high-risk patients (conditional recommendation, moderate quality of evidence).

The role of antibiotics in acute pancreatitis

20. Antibiotics should be given for an extrapancreatic infection, such as cholangitis, catheter-acquired infections, bacteremia, urinary tract infections, pneumonia (strong recommendation, high quality of evidence).

21. Routine use of prophylactic antibiotics in patients with severe acute pancreatitis is not recommended (strong recommendation, moderate quality of evidence).

22. The use of antibiotics in patients with sterile necrosis to prevent the development of infected necrosis is not recommended (strong recommendation, moderate quality of evidence).

23. Infected necrosis should be considered in patients with pancreatic or extrapancreatic necrosis who deteriorate or fail to improve after 7 – 10 days of hospitalization. In these patients, either (i) initial CT-guided fi ne needle aspiration (FNA) for Gram stain and culture to guide use of appropriate antibiotics or (ii) empiric use of antibiotics without CT FNA should be given (strong recommendation, low quality of evidence).

24. In patients with infected necrosis, antibiotics known to penetrate pancreatic necrosis, such as carbapenems, quinolones, and metronidazole, may be useful in delaying or sometimes totally avoiding intervention, thus decreasing morbidity and mortality (conditional recommendation, low quality of evidence).

25. Routine administration of antifungal agents along with prophylactic or therapeutic antibiotics is not recommended (conditional recommendation, low quality of evidence).

Nutrition in acute pancreatitis

26. In mild AP, oral feedings can be started immediately if there is no nausea and vomiting, and abdominal pain has resolved (conditional recommendation, moderate quality of evidence).

27. In mild AP, initiation of feeding with a low-fat solid diet appears as safe as a clear liquid diet (conditional recommendations, moderate quality of evidence).

28. In severe AP, enteral nutrition is recommended to prevent infectious complications. Parenteral nutrition should be avoided unless the enteral route is not available, not tolerated, or not meeting caloric requirements (strong recommendation, high quality of evidence).

29. Nasogastric delivery and nasojejunal delivery of enteral feeding appear comparable in effi cacy and safety (strong recommendation, moderate quality of evidence).

The role of surgery in acute pancreatitis

30. In patients with mild AP, found to have gallstones in the gallbladder, a cholecystectomy should be performed before discharge to prevent a recurrence of AP (strong recommendation, moderate quality of evidence).

31. In a patient with necrotizing biliary AP, in order to prevent infection, cholecystectomy is to be deferred until active infl ammation subsides and fl uid collections resolve or stabilize (strong recommendation, moderate quality of evidence).

32. The presence of asymptomatic pseudocysts and pancreatic and / or extrapancreatic necrosis do not warrant intervention, regardless of size, location, and / or extension (strong recommendation, moderate quality of evidence)

33. In stable patients with infected necrosis, surgical, radiologic, and / or endoscopic drainage should be delayed preferably for more than 4 weeks to allow

liquefi cation of the contents and the development of a fibrous wall around the necrosis (walled-off necrosis) (strong recommendation, low quality of evidence).

34. In symptomatic patients with infected necrosis, minimally invasive methods of necrosectomy are preferred to open necrosectomy (strong recommendation, low quality of evidence). AP, acute pancreatitis; CT, computed tomography; ERCP, endoscopic retrograde cholangiopancreatography; MRCP, magnetic resonance cholangiopancreatography

Summary & conclusion

1. In our analytical study of 25 cases of acute pancreatitis, there is male preponderance, with maximum 18 patients (72%) are below 45 years of age. Alcoholism ranks first as the etiological factor 48% followed by 20% biliary tract disease. Among the male, alcoholism is the most common etiological factor, because addiction of it is more common in males, while biliary tract disease is the most common factor in female. Abdominal pain, vomiting, fever, abdominal distention are its common clinical symptoms.

2. Peripancreatic fluid collection and necrotizing pancreatitis is predictor of severity of pancreatitis on USG and CT scan finding.

3. The initial management for an acute pancreatitis attack should be conservative; with surgery reserved for cases of complications of acute pancreatitis like pancreatic necrosis, pancreatic pseudocyst formation, gall stone pancreatitis, pancreaticascites, pancreatic abscesses and in some cases of trauma. Most of cases of acute pancreatitis (20 cases in my study)had self limiting course which were the cases of mild acute pancreatitis. Where as in 5 cases of acute severe pancreatitis with complication we had to explore.

4. Newer guidelines has been presented in 2013 by American College of Gastroenterology which will help in better management of patients of Acute Pancreatitis

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