ACUTE PANCREATITIS;
MANAGEMENT, MORBIDITY AND MORTALITY EXPERIENCE IN A SURGICAL UNIT

ORIGINAL
PROF-1808

DR. FAISAL G. BHOPAL, FRCS
Professor of Surgery, Rawalpindi Medical College.
Consultant Surgeon / Head of Surgical Unit - II,
Benazir Bhutto Hospital, Rawalpindi.

DR. FARYAL AZHAR, FCPS, MRCS
Senior Registrar Surgery
District Headquarters Hospital, Rawalpindi.

DR. SHAHID MAHMOOD, FRCS
Associate Professor of Surgery,
Fauji Foundation Medical College, Rawalpindi.

Prof. Muhammed Iqbal, FRCS
Professor of Surgery,
Shifa College of Medicine, Islamabad.

ABSTRACT... Acute pancreatitis represents a spectrum of disease ranging from a mild, self-limited course to a rapidly progressive, severe illness. The mortality rate of severe acute pancreatitis exceeds 20%, and some patients diagnosed as mild to moderate acute pancreatitis at the onset of the disease may progress to a severe, life-threatening illness within 2-3 days[1]. **Setting:** A study was conducted in RGH (Now BBH). **Period:** January, 1997 to January, 2001. All patients with abdominal pain and having a serum amylase level of five times the normal range, were included in the study. 72 patients were admitted. 29 (40.2%) were males and 42 (59.7%) were females. Male to female ratio was 2:3. The age of the patients ranged from 7 years to 85 years (average age 40 years). Disease severity was assessed according to Ranson's criteria. They were managed in a general surgical ward or intensive care unit when indicated. Development of complications and their management done were recorded. Patients stayed in the hospital from 1-21 days with an average period of 8.59 days. 32 (44.44%) recovered uneventfully without any complication while 40 (55.55%) patients developed either local or systemic complications. Overall 10 (13.88%) patients died early in the course of disease i.e. within one week. All of them were above 55 years of age, 6 of them were females and 4 of them were males, mortality ratio for female to male was 3:2. **Purpose of study:** (1) To study the morbidity and mortality in patients of acute pancreatitis. (2) To evaluate the management of acute pancreatitis in a general surgical unit. **Conclusions:** Management of mild acute pancreatitis is simple, it needs only supportive treatment. However, the management of severe acute pancreatitis is complex. Mortality is high and the treatment requires individualized approach regarding timing of surgery and choice of technique.

Key words: Acute Pancreatitis, Management, Morbidity, Mortality.

INTRODUCTION

Acute pancreatitis is a common cause of abdominal pain. The clinical course is unpredictable and about 10% of attacks prove fatal. Overall, survival has remained static, despite improvements in intensive therapy, and radiological and surgical interventions[2]. Acute pancreatitis is a potentially life-threatening illness, with a short time frame for diagnosis and treatment[3]. Acute pancreatitis is characterized by a systemic inflammatory response that may progress to multiple organ failure and death[4]. The diagnosis of acute pancreatitis is based on the following findings: (1) acute attacks of abdominal pain and tenderness in the epigastric region, (2) elevated blood levels of pancreatic enzymes, and (3) abnormal diagnostic imaging findings in the pancreas associated with acute pancreatitis[5]. Early diagnosis and assessment in acute pancreatitis is still far from ideal[6]. The clinical course of acute pancreatitis varies from mild to severe. Assessment of severity and etiology of acute pancreatitis is important to determine the strategy of management for acute pancreatitis[7]. When a diagnosis of acute pancreatitis is made, fundamental medical treatment consisting of fasting, intravenous fluid replacement, and analgesics with a close monitoring of vital signs should be immediately started[8].

A severe attack is usually defined as one that leads to the development of the one or more serious complications or result in death. It is important, therefore, to identify those patients who will have severe attack. By identifying those likely to develop complications, prevention of systemic and local complications, timing of intervention and the choice of the appropriate non-operative or surgical technique. These patients get the best chance of survival[9].

PATIENTS AND METHODS

This study was conducted in 72 patients who presented with acute pancreatitis in a Surgical Unit, Rawalpindi General Hospital (Now BBH), Rawalpindi from January, 1997 to January, 2001. Patients were admitted through Emergency & from out patient department. All patients with abdominal pain and having a serum amylase level of

five times the normal range, were included in the study. Patients were evaluated by history, clinical examination and relevant investigations. Disease severity was assessed according to Ranson's criteria. Patients were stratified into mild acute pancreatitis having < 3 Ranson's score and severe acute pancareatitis having > 3 Ranson's score.

They were managed in a general surgical ward or intensive care unit when indicated. Development of complications, their management done and the outcome of disease were recorded. Patients were followed up during the study period.

In all 72 patients investigations carried out were: Blood complete examination including hematocrit, Urine routine examination, Serum sugar random, Serum urea and creatinine, Liver function tests including LDH, Serum Calcium, Arterial blood gasses, Chest X-ray – PA View, Abdominal X-rays (Erect / supine), ECG

Special investigations like ultrasonography, computed tomography and endoscopic retrograde cholangio-pancreatography (ERCP) were done selectively when indicated .

Patients were managed conservatively unless the diagnosis was not clear, only then exploratory laparotomy was carried out urgently to rule out other causes of acute abdomen. Oral intake was withheld and nasogastic intubation was done for severe vomiting.

Dehydration and electrolyte imbalance was corrected with intravenous crystalloids. Hypoxia was treated by oxygen therapy. CVP monitoring was done when shock, oliguria or respiratory insufficiency supervened. Analgesia was achieved by Injection Diclofenac / Pentazocin and spasmolytic agents like hyoscin butylbromide was added selectively. Prophylactic antibiotics used was cefuroxime.

Total parenteral nutrition was started for patients on prolonged starvation .

Further management in the ward Included :

- Assessment of disease severity by Ranson's criteria.
- Determination of possible etiological factors.
- Treatment of etiological factors (Cholecystectomy and CBD exploration or ERCP) when required.
- Detection and management of complications accordingly.
- The prediction and the actual outcome.
- The deteriorating patients were shifted to ICU.

RESULTS

Age and sex distribution

A total of 72 patients were studied, out of which 29 (40.2%) were males and 42 (59.7%) were females. Male to female ratio was 2:3. The age of the patients ranged from 7 years to 85 years (average age 40 years).

Table-I. Distribution of Age

Age	No. of patients
> 50 years	27
30-49 years	19
10-29 years	22
< 10 years	04

Length of Hospital Stay

Patients stayed in the hospital from 1-21 days with an average period of 8.59 days.

Table-II. Length of Hospital Stay

Duration	No. of patients
< 7 days	38
8-14 days	25
> 14 days	09

CLINICAL FEATURES: (Abdominal pain and tenderness)

All the 72 (100%) patients presented with abdominal pain and tenderness The duration of pain on admission ranged from half an hour to one week (average duration 2.18 days). Epigastrium was the commonest site of pain and tenderness. The pain was severe in intensity and often radiated to the back in most of the patients.The complaint of nausea & vomiting was reported by all

72(100%) patients. 8 patients(11.11%) presented with history of fever 2-5 days, was low grade in 6 and high grade in the 2 patients.

Previous history of Jaundice in only 15(20.83%) patients. 23(31.94%) patients also gave past history of chronic cholecystitis or gallstone.

On physical examination, abdominal guarding was present in 47(65.27%) patients and generalized rigidity was observed in 18 (25%) patients.

The bowel sounds were absent in 16 (22.22%) patients.

INVESTIGATIONS: (Radiography)

On chest X-rays, left sided pleural effusion was seen in 5(6.94%) patients. Multiple air fluid levels were seen on abdominal X-rays in 12 Patients(16.66%).

Table-III. Laboratory Investigations

Investigations	Average	Range
S. Amylase	2560 IU/L	69-7850 IU/L
WBC	14.35 x 10^9 / L	4.1 x 23.5 x 10^9/L
BSR	135.42 mg/dl	31-380 mg/dl
S. Urea	47.26 mg/dl	12-193 mg/dl
LDH	489.65 IU/L	132-2216 IU/L
AST	87.52 IU/L	22-297 IU/L
S. Calcium	8.44 mg/dl	6-9.7 mg/dl
PaO2	65.87 mmHg	30-96 mmHg
Base Deficit	5-18 meq/L	0.4-21.4 meq/L

1. ULTRASONOGRAPHY

Abdominal Ultrasonography was performed in 66 patients. (91.66%). It was non-diagnostic in 15 (20.83%) cases , detected edematous pancreas in 26 (36.11%) of cases, gallstones in 32 (44.44%), CBD stones/ Dilated in 10 (13.88), ascites in 12 (16.66%), pleural effusion in 5 (6.94%) and pancreatic pseudocyst in 6 patients (8.54%).

2. Endoscopic Retrograde Cholangiopancreatography

ERCP was performed in 8 (11.11%) patients with clinical jaundice or ultrasonographic evidence of choledocholithiasis. No stones were detected in two patients. In rest 6 patiens, endoscopic sphincterotomy was performed for removal of CBD stones. Jaundice was relieved and patients gradually got better.

3. Computed Tomography

CT scan was performed in 10 (13.88%) patients with severe acute pancreatitis and in those deteriorating with conservative management. The findings of CT scan were, edematous or hemorrhagic pancreas, cholelithiasis, CBD stones, ascites and pseudocysts.

Conservative Management

The oral intake was withdrawn in all 72 (100%) patients for a period ranging from 1-12 days (average duration 4.71 days) Nasogastric intubation was done in 64 (88.88%) patients in cases of severe vomiting and epigastric distension. The duration of nasogastric intubation ranged from 1-12 days with an average duration of 4.38 days. Oral fluids were started gradually after removal of nasogastric tube. Intravenous line was established using crystalloids for the correction of dehydration and electrolyte imbalance.

Intramuscular injection of Diclofenac sodium or Pentazocin was used to relieve pain in almost all the patients. In addition, spasmolytics like injection Hyoscin butyl bromide was added in 17 (23.6%) patients for severe abdominal pain, not relieved by analgesics alone.

Prophylactic antibiotics (cefuroxime 750mg intravenously 8 hourly) were used in almost all the cases. Oxygen therapy by face mask for all cases of severe acute pancreatitis and in those who developed respiratory complications.

Central venous line was passed in 12 (16.66%) patients with severe acute pancreatitis, in those who developed complications like shock (B.P < 90 mmHg) and oliguria (< 300ml/d) and for whom total parenteral nutrition was contemplated. CVP was kept for an average period of 4.18 days (Range 1-7 days) No complication of central

Table-IV. Etiological Factors

Factor	No. of patients	%age	Factor	No. of patients	%age
Cholelithiasis	32	44.44%	Postoperative Whipple's	02	2.77%
Alcohol	03	4.16%	Splenectomy	01	1.38%
Post ERCP	02	2.77%	Duodenal Diverticulum	01	1.38%
Trauma Firearm Injury	03	4.16%	Pancreatic Divisum	01	1.38%
Idiopathic	27	37.5%			

line was observed in this study.

Severity

Ranson's score of the patients ranged from 0 to 8, with an average score of 1.82. 53 (73.61%) patients were predicted as having mild acute pancreatitis with an average Ranson's score of 1.12 and 19 (26.38%) patients were predicted as having severe acute pancreatitis with an average Ranson's score of 4.12.

Etiology

Cholelithiasis was the most common etiological factor detected in 32 (44.4%) patients. In 27(37.5%) patients, etiology remained undiagnosed (idiopathic) .

SURGICAL INTERVENTION

1. Urgent exploratory laparatomy was performed in 8 (11.11%) patients when the diagnosis was in doubt and other causes of acute abdomen could not be ruled out as the serum amylase levels were equivocal. Out of 8 patients, edematous pancreas was found in two patients. One of them recovered uneventfully and the other developed pseudocyst. In 4 patients acute hemorrhagic pancreatitis was found. One patient recovered and one died post operatively. The other two patients developed pseudocysts later on. Pancreatic necrosis was found in rest of the two patients. Necrosectomy was done. One patient died post operatively and the other developed pseudocyst.

2. Elective Cholecystectomy: Out of 32 patients with cholelithiasis, 30 patients underwent elective cholecystectomy after a period of 6 weeks. 2 patients were lost in the follow up. 4 patients also underwent CBD exploration and stone removal in addition to cholecystectomy.

3. Cystogastrostomy: 6 (8.33%) patients developed pseudocyst of pancreas. 2 (2.77%) pseudocysts resolved in a period of 4-6 weeks of conservative management. Remaining 4 (5.55%) pseudocysts which did not resolve in the same period, were treated by cystogastrostomy with uneventful recovery. No complication was observed and no mortality occurred.

OUT COME

32 patients (44.44%) recovered uneventfully without any complication while 40 (55.55%) patients developed either local or systemic complications.

Systemic Complications

1. **Cardiovascular collapse:** (B.P. < 90 mmHg). 4 (5.55%) patients went into shock. They were managed coservatively using crystalloids and colloids according to CVP.

2. **Respiratory Insufficiency:** 6 (8.33%) patients developed respiratory insufficiency ($PaO_2 < 60$ mmHg) They were treated by oxygen by face mask.

5 (6.94%) patients developed pleural effusion which settled down conservatively.

3. **Renal Insufficiency:** 4 (5.55%) patients had acute renal failure {creatinine > 177 mmol/L

(2mg/dl)} requiring hemodialysis.

4. **Metabolic Insufficiency:** 2 (2.77%) patients developed persistent Diabetes mellitus (BSR > 10 mmol/L). 12 (16.66%) patients developed hypocalcemia.10 (13.88%) patients developed metabolic acidosis, managed by correction of fluid and electrolyte imbalance and oxygen.

5. **Gastrointestinal Complications Ileus**: 12 (16.66%) patients developed paralytic ileus requiring decompression by nasogastric tube and correction of fluid and electrolyte imbalance.

Ascites: 8 (11.11%) patients developed ascites. They were all managed conservatively.

Hemetemesis: 2 (2.77%) patients developed hemetemesis. Treated by gastric Lavage, injection Ranitidine and antacid.

LOCAL COMPLICATIONS

Pancreatic Necrosis

2 (2.77%) out of 4 (5.55%) patients had pancreatic necrosis observed on exploratory laparotomy. They were managed by necrosectomy and drains. One of them later developed pancreatic pseudocyst and the other died post operatively. Other 2 necroses were diagnosed on CT scan and were managed conservatively and both survived.

Pancreatic Pseudocyst

6 (8.33%) patients developed pseudocysts in a period of 3-4 weeks of onset, confirmed on abdominal ultrasonography and CT scan. 2 of the cysts were managed conservatively and remaining 4 pseudocysts were treated by cystogastrostomy after conservative management for a period of 4-6 weeks with uneventful recovery.

MORTALITY

Overall 10 (13.88%) patients died early in the course of disease i.e. within one week. All of them were above 55 years of age, 6 of them were females and 4 of them were males, mortality ratio for female to male was 3:2.
No death was observed in 53 patients of predicted mild acute pancreatitis while 10 out of 19 patients with predicted severe acute pancreatitis died. Mortality rate being 52.63% in patients with severe acute pancreatitis. These patients were received in the emergency room in critical condition. Two of them had to undergo exploratory laparotomy. One had hemorrhagic pancreatitis and the other had pancreatic necrosis on laparatomy. These patients developed multiple organ failure particularly cardiovascular collapse, respiratory insufficiency and renal failure. They were managed in the intensive care unit. Central venous line was established in all of them. Total parenteral nutrition was given in two of them and two of them were put on ventilator for respiratory failure. Hemodialysis was done in one patient

DISCUSSION

The incidence of acute pancreatitis is not documented in our population. It accounts for 3% of all cases of abdominal pain admitted to hospitals in the UK[10]. In most series of necrotizing pancreatitis, biliary and alcoholic pancreatitis occur with equal frequency[11]. In our patients, there was a higher incidence of biliary pancreatitis as quoted by Tavernier M, Paye F[12].

Most patients typically presented with sudden onset of severe abdominal pain[13], often radiating to back and associated with nausea and vomiting. No case of abdominal bruising (Cullen's sign and Grey turner's sign) was seen in this study.

64 (88.88%) patients were managed conservatively initially. Two cases of pancreatic necrosis found on exploratory laparotomy were managed by necrosectomy followed by abdominal closure with drains in the cavity as advocated by Wilson et al[14]. Cases of pancreatic necrosis, diagnosed on CT scan, were managed conservatively as several recent reports suggested that up to 80% of patients with sterile necrosis can be managed non operatively[15]. Our conservative approach in the ward and I.T.C. was in line with as suggested by Huber W, Schmid RM et al[3].

Prophylactic antibiotics were used in almost all the cases as recent evidence suggest a benefit from the use of prophylactic antibiotics in prognostically severe acute

pancreatitis[16]. In a recent survey of antibiotic prophylaxis in acute pancreatitis in the UK, and Ireland, it was found that 88% of respondents were prescribing prophylactic antibiotics in acute pancreatitis[17].

We performed elective cholecystectomy in patients with cholelithiasis after an interval of 6 weeks after discharge from hospital, however, patients with mild pancreatitis may be safely operated on at any stage during the first admission for pancreatitis[18].

About 40 (55.55%) patients developed either local or systemic complications, and they were managed accordingly. The results are quite similar with study from 24 hospitals in Yorkshire and Glasgow, except that our patients are relatively younger (40 Vs 57) and acute pancreatitis appears to be commoner in females (M:F = 1:1 Vs 3:2) in our population.

Overall mortality rate in this study was 13.88% which is also comparable to 10-15% mortality rate of most published series[19]. However, the mortality from necrotizing pancreatitis is around 30-40%[20]. The mortality rate is particularly high (34-40%) for infected pancreatic necrosis[7]. The mortality rate in this study was 52.63% in patients with severe acute pancreatitis. Various factors are responsible for the mortality in patients with acute pancreatitis. About one third of patients die in the early phase of an attack from multiple organ failure[19]. Most deaths occur due to major fluid deficit early in acute pancreatitis and infective complications particularly infected necrosis after one week of onset[13]. Other causes include elderly patients with comorbid problems[21] and certain etiological groups for example post operative acute pancreatitis[20]. Gallstone associated pancreatitis and old age with comorbid conditions were responsible for early deaths observed in this study.

Recently decreased mortality (19%) from necrotizing pancreatitis has been claimed[22] owing to comprehensive approach to management that includes early, if necessary, repeated pancreatic debridement, timely shock resuscitation with restoration of aerobic metabolism as the goal of therapy, broad spectrum antibiotics for infected necrosis and early nutritional support. In this study our approach has been on the same lines.

Stratifying patients according to illness severity on admission by Ranson's criteria found a great application in predicting outcome in critically ill patients, as the results of this study show no mortality in patients with mild acute pancreatitis and very high morbidity and mortality (52.6%) rate is patients with predicted severe acute pancreatitis.

CONCLUSIONS

Management of mild acute pancreatitis is simple, it needs only supportive treatment. However, the management of severe acute pancreatitis is complex. Mortality is high and the treatment requires individualized approach regarding timing of surgery and choice of technique.

Aggressive fluid resuscitation, respiratory support, hemodynamic monitoring and total parenteral nutrition have dramatically reduced the early mortality rates. Also, a better understanding of the pathophysiology of necrotizing pancreatitis and its subsequent "superinfection" has led to improved treatment modalities and outcome.

The role of intensive therapy in the management of severe acute pancreatitis can not be over emphasized. Ranson's criteria with its high sensitivity and specificity guide us in identifying patients at risk of developing complications, so that they can be managed in an intensive care unit and help us prevent early deaths in these severely ill patients.

Based on the results of this study, I conclude that Ranson's multifactorial scoring system in terms of assessment of disease severity and prediction of outcome, in patients with acute pancreatitis is reliable and valid in our set of population as well.

REFERENCES

1. Isaji S, Takada T, Kawarada Y, Hirata K, Mayumi T, Yoshida M, Sekimoto M, et al. **JPN Guidelines for the**

management of acute pancreatitis: surgical management. J Hepatobiliary Pancreat Surg. 2006;13(1):48-55.

2. Iarvin M, **Acute pancreatitis. Surgery**. 1996; 14:6:121-128.

3. Huber W, Schmid RM: **Diagnosis and treatment of acute pancreatitis: Current recommendations.** Internist (Berl). 2011 Jul;52(7):823-832.

4. De Beaux AC, Ross JA, Maingay JP, Fearon KCH, Carter DC. **Proinflammatory cytokine release by peripheral blood mononuclear cells from patients with acute pancreatitis.** Br. J. Surg. 1996, 83, 1071-1075.

5. Mayumi T, Takada T, Kawarada Y, Hirata K, Yoshida M, Sekimoto M, Hirota M, et al. **Management strategy for acute pancreatitis in the JPN Guidelines.** J Hepatobiliary Pancreat Surg. 2006;13(1):61-7.

6. Kempaninen E, Sainio V, Haapianen R, et al. **Early localization of necrosis by contrast enhanced computed tomography can predict outcome in severe acute pancreatitis.** Br. J Surg. 1996, 83, 924-929.

7. Amano H, Takada T, Isaji S, Takeyama Y, Hirata K, Yoshida M, Mayumi T, et al. **Therapeutic intervention and surgery of acute pancreatitis.** J Hepatobiliary Pancreat Sci. 2010 Jan;17(1):53-9. Epub 2009 Dec 12.

8. Wada K, Takada T, Hirata K, Mayumi T, Yoshida M, Yokoe M, Kiriyama S, et al. **Treatment strategy for acute pancreatitis.** J Hepatobiliary Pancreat Sci.2010 Jan;17(1):79-86. Epub 2009 Dec 11.

9. Talukdar R, Swaroop Vege S. **Early management of severe acute pancreatitis.** Curr Gastroenterol Rep. 2011 Apr;13(2):123-30.

10. De Dombai F (ed) **The abdomen: definitions disease and decision In: Diagnosis of acute abdominal pain.** 2nd edn. London: Churchill Livingston, 1991: 19 : 30.

11. Le Mee J, Sauvanet P, Werner P, Belghiti J. **Morphological aspects of necrosis as a guideline for treatment of necrotizing pancreatitis: a brief report about 50 patients,** Dig Dis Scri. 1997; 42: 1972-1975.

12. Tavernier M, Paye F: **Acute pancreatitis: positive and etiological diagnosis, progressive forms.** Rev Prat. 2011 Feb;61(2):210-4.

13. Paye F: **Acute pancreatitis: diagnosis and therapeutic principles.** Rev Prat. 2002 Sep 15;52(14):1554-60.

14. Powell JJ, Miles R, Siriwardena AK. **Antibiotic prophylaxis in the initial management of severe acute pancreatitis.** Br. J. Surg. 1998: 85: 582-7.

15. Steinberg WM, Barkin J, Bradley EL et al. **Controversies in clinical pancreatology.** Pancreas. 1996: 13: 219-223.

16. Powell JJ, Miles R, Siriwardena AK. **Antibiotic prophylaxis in the initial management of severe acute pancreatitis.** Br. J. Surg. 1998: 85: 582-7.

17. Powell JJ, Campbell E, Johnson CD Siriwardena AK. **Survey of antibiotic prophylaxis in acute pancreatitis is the UK and Ireland.** Br. J. Surg. 1999, 86, 320-322.

18. Johnson CD. **Intervention in acute pancreatitis.** Recent advances in surgery 1993: 16: 121-140.

19. Mann DV, Hershman M, Hittinger R, et al. **Multicentre audit of death from acute pancreatitis.** Br J. Surg 1991: 81: 890-3.

20. Karimgani I, Porter K, Langevin R, et al. **Prognostic factors in sterile pancreatic necrosis.** Gastroenterology 1992: 103: 1636-40.

21. Fan S, Choi T,. Lai C, et al, **Influence of age on the mortality from acute pancreatitis.** Br J Surg 1988; 75: 163-6.

Article received on: 05/07/2011 Accepted for Publication: 13/07/2011 Received after proof reading: 12/08/2011

Correspondence Address:
Prof. Dr. Faisal G. Bhopal.
House #14-A, Street #31,
F - 8/1, Islamabad.
bhopalfg@hotmail.com

Article Citation:
Bhopal FG, Azhar F, Mahmood S, Iqbal M. Acute pancreatitis; management, morbidity and mortality experience in a surgical unit. Professional Med J Sep 2011;18(3): 366-372.