

Incidence of SIRS in Acute Biliary Pancreatitis

Mohammad Ramzan, Fakhar Hameed, Bashir Ahmad

ABSTRACT

Objective: To see the incidence of systemic inflammatory response syndrome (SIRS) in acute biliary pancreatitis. Setting: Department of surgery, Armed Forces Hospital Dhahran, Saudi Arabia. Period: From January 2001 to January 2009. Patients and methods: Clinical and biochemical data of 102 patients of acute biliary pancreatitis was analyzed retrospectively. Acute biliary pancreatitis was more common in females (74.5% vs. 25.5%) with a female to male ratio of 2.9:1. Majority of patients (70.6%) were in the age range of 21-50 years. All patients had ultrasound abdomen, hemoglobin, TLC, BUN, Creatinine, blood gases, liver function tests, serum amylase and lipase. Computed tomography of abdomen (CT) was done

in 16 (15.69%) patients and ERCP was done in 30 (29.4%) patients.

Results: Only 2 patients had fever and leukocytosis consistent with SIRS whereas 8 (7.8%) had fever above 38°C only and another group of 22 (21.6%) patients had TLC >12000 cu mm. Clinical and biochemical abnormalities normalized in almost all patients within 72 hours.

Conclusion: The group of patients who do not show SIRS and their clinical and biochemical abnormalities settle quickly should be named differently for statistical correction and management.

Keywords: Acute biliary pancreatitis, systemic inflammatory response syndrome.

INTRODUCTION

Acute pancreatitis is an acute inflammatory process arising in the pancreas. There may be varying degrees of peri-pancreatic and remote organ involvement depending upon its severity. Its incidence ranges from 10-50/100,000 per annum [1]. Alcohol abuse is the leading cause of acute pancreatitis in the western world whereas gallstone or biliary pancreatitis is the predominant type in Saudi Arabia [2]. As it is an inflammatory process, it is usually associated with systemic inflammatory response Syndrome (SIRS). According to the consensus conference of American College of Chest Physicians and Society of Critical Care Medicine held in 1991 [3] SIRS is defined as the presence of the two or more than two of the following variables in a patient;

- Fever >38°C or <36°C
- Heart rate >90/min
- Respiratory rate >20/min or PCO₂ <32 mmHg
- White blood count >12000 cu mm or <4000/cu mm or the presence of >10% bands.

The aims of this retrospective study were to review the clinical and biochemical data of acute biliary

pancreatitis patients, to see the incidence of SIRS in these patients and to evaluate is there any need to rename that group of patients whose clinical and biochemical abnormalities settle quickly and they do not show any features of SIRS.

PATIENTS AND METHODS

The clinical and biochemical data of all the patients of acute biliary pancreatitis, admitted at Armed Forces Hospital Dhahran Saudi Arabia, was retrospectively analyzed.

Inclusion criteria: The diagnosis was based on the typical abdominal symptoms of upper abdominal pain radiating to back associated with nausea and/or vomiting, presence of gallstones on ultrasound or history of cholecystectomy in the recent past and a serum amylase and/or lipase levels of > 1000 IU/L.

Exclusion criteria: The exclusion criteria were age below 13 yrs, acute non biliary pancreatitis, combination of cholangitis and pancreatitis, patients with sickle cell disease, pancreatic malignancy and cirrhosis.

Age: The patients were divided into three groups according to their age, Group-1 13-20 years, Group-2 21-50 years and Group-3 >50 years.

RESULTS

Over a period of 8 years (January 2001 to January 2009) 102 patients met the inclusion criteria of acute biliary pancreatitis. The mean and median ages for females and males were 37.7, 35, 48.5 and 48 years respectively. The majority of patients (70.6%) were in the age range of 21-50 years and acute biliary pancreatitis was more common in females (74.5%) (Table-1).

Table-1
Age Distribution of Acute Biliary Pancreatitis (n=102)

Age	No of pts (%)	Females (%)	Males (%)	Female to Male ratio
13-20 years	04 (3.95)	04 (3.95)	00	4:0
21-50 years	72 (70.6)	58 (56.9)	14 (13.7)	4:1
>51 years	26 (25.5)	14 (13.7)	12 (11.8)	1.2:1
Total	102	76 (74.5)	26 (25.5)	2.9:1
Mean Age		37.7 years	48.5 years	
Median Age		35 years	48 years	

Pain epigastrium was the most common presentation followed by pain right hypochondrium and vomiting. The mean duration of symptoms before admission was 2.2 days (median=1 day). Only 8 patients had fever above 38°C but below 39°C whereas none of the patients showed any other clinical features of SIRS. All patients were symptom free within 24 hours of admission. Four patients had previous episodes of pancreatitis and 18 patients had history of cholecystectomy in the recent past. The clinical features of patients are analyzed in Table-2.

The diagnosis was based on a raised serum amylase of >1000 IU/L in 74 (72.6%) patients, a raised serum lipase of > 1000 IU/L in 22 (21.57%) patients and both amylase & lipase were >1000 U/L in 48 (47.1%) patients. All these values returned to normal within 72

hours in all except 2 patients who showed persistent hyperlipasemia up to 2 weeks although all other clinical and biochemical parameters were normal (a condition where lipase binds to IgG, named as macrolipase and takes longer to get cleared by kidneys) [4]. There was concomitant derangement of all liver enzymes which also normalized in 72 hours except Gamma glutamyl transferase (GGT) and alkaline phosphatase (ALP) which took 2 weeks to normalize. 58 (56.9%) patients had elevated levels of bilirubin (both total & direct). Leukocytosis was present in 22 (21.6%) of patients and out of these only 6 patients (5.9%) had a white cell count above 15000/cu mm (Table-3).

Table-2
Clinical Features Analysis of Acute Biliary Pancreatitis (n=102)

Clinical feature	No of pts (%)	Mean & median durations
Pain epigastrium	66 (64.7)	2.2 & 1 day
Pain Rt hypochondrium	48 (47)	2.2 & 1 day
Vomiting	48 (47)	2.2 & 1 day
Fever 38-39°C	08 (7.8)	2.2 & 1 day
37-38°C	02 (1.96)	
Jaundice	18 (17.65)	
Heart rate >90/min	00	
Respiratory rate >20/min	00	
Past history pancreatitis	4 (3.9)	
Cholecystectomy	18 (17.65)	
Co morbidities	4 (3.9)	
Diabetes		
Hypertension	4	
Cardiac disease	4	
Bronchial asthma	2 (1.96)	

Table- 3
Biochemical data analysis (n=102)

Name (normal range)	No of pts with abnormality (%)	Value Mean & median
Hemoglobin (M 13-15g/dl)	Nil	

F 11-15g/dl)		
TLC (4000-11000/cu mm)	22 (21.6)	13.7
11000-15000	6 (5.9)	13.6
>15000	16 (15.7)	
<4000	NIL	
BUN(2.5-7.8mmol/L)	NIL	
Creatinine (M 71-115 F 53-89mmol/L)	NIL	
Glucose (3.9-6.1 mmol / L)	4 (diabetic)	9.2 9
PO2 (98-100mm Hg)	NIL	
PCO2 (40-45mm Hg)	NIL	
LDH (100-190 U/l)	102 (100)	263.9 226.5
SGOT (27-47U/L)	88 (86.3)	288.2 199
SGPT (3-36U/L)	90 (88.2)	295.2 236
GGT (85U/L)	98 (96.1)	468 321
ALP (50-136U/L)	84 (82.4)	280 263
T.B (7-20umol/l)	58 (56.9)	66 47
D.B (0-6umol/L)	58 (56.9)	45.8 32
Amylase(27-116 U/L)	74 (72.6)	2401 1753.5
Lipase (114-286 U/L)	22 (21.57)	9887.4 9645
Amylase+Lipase	48 (47.1)	

TLC=total leukocyte count, LDH=lactic dehydrogenase, SGOT=serum glutamic oxaloacetic transaminase, SGPT (ALT) = serum glutamic pyruvic transaminase, GGT=gamma glutamyl transeferase, ALP=alkaline phosphatase, T.B=total bilirubin, D.B=direct bilirubin

Ultrasound abdomen was done in all patients, 78 (76.5%) patients had multiple gallstones 18 (17.65%) patients already had cholecystectomy, 4 patients (3.9%) had solitary gallstone, 2 (1.96%) patients had gallbladder mud and 4 patients were having radiological features of acute cholecystitis. CBD was mildly dilated (>8mm) in 12 (11.77%) patients with a suspicion of stone in it. Out of these 12

pts only 6 pts had a stone on ERCP (endoscopic retrograde cholangiopancreatography).

Computed tomography of abdomen (CT) was done in 16 (15.69%) patients, reasons were not clear from the record but probably it was done due to advanced age and persistent hyperlipasemia. CT scan showed only mild pancreatic head edema and minimal left sided pleural effusion in 4 patients.

ERCP was done in 30 (29.4%) patients and the mean duration from admission to ERCP was 8 days with a median of 7.5 days. Its main indications were suspicion of stone in CBD on ultrasound, dilated distal end of CBD (> 8 mm), persistent hyperbilirubinemia and lipasemia. Out of these 30 pts only 6 pts (20%) had CBD stone, one had double papillae and one developed cholangitis after the procedure.

64 patients (64/84=76.2%) underwent laparoscopic cholecystectomy within a median duration of 7 days (mean 8.9), 4 pts were referred to a tertiary center due to severe cardiac disease, and 16 (15.7%) patients refused surgery. Two patients were converted to open due to obscured anatomy and all the patients had an uneventful recovery.

DISCUSSION

The exact pathophysiology of gallstone pancreatitis is not understood. In 1901 Opie[5], for the first time, described an association between the obstruction of distal bile duct from a migrating gallstone and the development of acute pancreatitis. Although majority of stones pass spontaneously into the duodenum but persistent ampulary obstruction triggers the cascade of events leading to acute pancreatitis[6,7]. A multiple hit theory was advanced by Neoptolemos and according to which repeated attacks of ampulary obstruction by migrating gallstones lead to severe pancreatitis[8]. It is not clear whether it is the pancreatic duct obstruction or the bile reflux (sterile or infected) into the pancreatic duct responsible for the intrapancreatic activation and release of pancreatic enzymes. Endogenous alpha1 antitrypsin and alpha2 macroglobulin can overcome the release of small amounts of activated trypsin. Large amounts of pancreatic enzymes overwhelm these defense mechanisms causing tissue damage, white blood cells activation and the release of inflammatory mediators. If the balance between pro-/anti-inflammatory cytokines is lost there will be SIRS leading to pancreatic, peri-pancreatic and remote organ damage depending upon the cytokine load [9,10].

Gallstone pancreatitis is more common in Saudi Arabia than the western world but up to our knowledge none of the local or international studies have examined this condition in relation to SIRS [11,12].

In our study 22 (21.6%) patients showed only one variable of SIRS (TLC >12000/cu mm) and another group of 8 (7.8%) patients had fever more than 38°C. Only two (1.96%) patients had both fever and leukocytosis. None of our patients had any other variable of SIRS. All the patients except two had only transient elevations of amylase and/or lipase. Although our study carries all the drawbacks of a retrospective analysis but it opens up a new discussion that should this group of patients be named separately from acute pancreatitis for statistical correction? Further prospective studies are required to answer this question.

CONCLUSION

Gallstone associated acute pancreatitis is very common in Saudi Arabia. Only few patients show the features of SIRS and the majority of them settle very quickly, clinically and biochemically as the migrating stone causes a transient ampulary obstruction. Therefore this group of patients should be named differently from acute pancreatitis.

REFERENCES

1. James H. Grendell. Acute Pancreatitis. Textbook of Internal Medicine (3rd edition) William N. Kelly 1997. Chapter. 123:793-802.
2. Abu-eshy.SA. Pattern of acute pancreatitis. Saudi med J 2001; 22: 215-8
3. Bone RC, Balk RA, Cerra FB. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. The ACCP/SCCM Consensus Conference Committee. American College of Chest Physicians/Society of Critical Care Medicine. Chest. 1992; 101: 1644-55.
4. Keating JP, Lowe ME. Persistent hyperlipasemia caused by macrolipase in an adolescent. J Pediatr. 2002; 141: 129-31.
5. Opie EL. The etiology of acute haemorrhagic pancreatitis. John Hopkins Hosp Bull. 1901; 121: 182-8.

6. Acosta JM, Ledesma CL. Gallstone migration as a cause of acute pancreatitis. N. Eng J Med. 1974; 290: 484-7.
7. Acosta JM, Pellegrini CA, Skinner BD. Etiology and pathogenesis of acute biliary pancreatitis. Surgery. 1980; 88: 118-25.
8. Neoptolemos JP. The theory of 'persisting' common bile duct stones in severe gallstone pancreatitis. Am R Coll Surg Engl. 1989; 30: 397-403.
9. Zakaria M.Hazem. Acute biliary pancreatitis: diagnosis and treatment. Saudi J Gastroenterol 2009; 15 :147-55.
10. Jiongxin XIONG, Shikai ZHU, Yu ZHOU, Heshui WU, Chunyou WANG. Regulation of ω-3 Fish Oil Emulsion on the SIRS during the Initial Stage of Severe Acute Pancreatitis. J Huazhong Univ Sci Technol[Med Sci] 2009; 29: 35-38.
11. Al Karawi MA, Mohamed AE, Dafala MM, Yasawi MI, Ghadour ZM. Acute pancreatitis in Saudi patients. Saudi J Gastroenterol 2001; 7: 30-3.
12. Saeed A Abu-Eshy, Moustafa.A Abolfoutoh, Eldawai Nawar, Abdul Rehman. Ranson's criteria for acute pancreatitis in high altitude. Do they need to be modified? Saudi J Gastroenterol 2008; 14: 20-3.

AUTHORS

- **Dr. Mohammad Ramzan**
Senior Registrar,
Dehran Defence Hospital,
Saudi Arabia.
- **Dr. Fakhar Hameed**
Assistant Professor Surgery,
Punjab Medical College, Faisalabad.
- **Dr. Bashir Ahmad**
Senior Registrar Surgery,
Surgical Unit-I,
Allied Hospital, Faisalabad.