Original Research Article

Compressive idea of manifestation and biochemical relation of acute pancreatitis in tertiary care hospital

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Abstract

Background: Acute pancreatitis is a sudden inflammation that lasts for a short time. It may range from mild discomfort to a severe, life-threatening illness. **Methods:** It was Prospective and observational study. All the patients admitted in medicine department and ICU and diagnosed as acute pancreatitis. Study period was January 2018 to September 2019. And sample size was 30. Investigation was done in the department of Biochemistry. **Results:** The prevalence rate of acute pancreatitis was higher in male than female with a ratio of 1.72:1 and we found maximum patients were in the age group of 41-50 years. While analysing the biochemical parameters we found very obvious a high lipase, amylase and triglyceride level in the study subjects accounting most of the cases as these biochemical parameters are directly related to acute pancreatitis. **Conclusion:** Pancreatic necrosis may lead to the development of pancreatic pseudocysts or tissue abscess, common complications associated with pancreatitis. A better understanding of the nature of cardiac dysfunction in this setting may allow more accurate diagnosis, prognostication, and management.

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INTRODUCTION

Acute pancreatitis, an inflammatory disease of the pancreas, is mild and resolves without severe complications in 80 per cent of patients, but has complications and major mortality in up to 20 per cent of patients.[1] Its aetiology and pathogenesis have been widely studied in the world for centuries.[2] In 1856, Claude Bernard indicated that the reflux of bile into the common pancreatic duct could cause acute pancreatitis.[3] Several subsequent studies led to hypotheses that intensified the debate until 1901[4] when Eugene Opie suggested that gallstone migration to the common bile duct was the key cause of acute pancreatitis.[5] Since then, several other causes of pancreatitis have been identified.[6] However the pathogenesis of acute pancreatitis remains controversial to date. Several hypotheses aim to clarify the pathogenesis of acute pancreatitis. In the case of disease pathogenesis, Whether acute pancreatitis is simply a single entity or a group of distinct pathogenic entities remains uncertain. From a pathogenic point of view, acute pancreatitis is an identity crisis.[7]

METHODOLOGY

It was Prospective and observational study. All the patients admitted in medicine department and ICU and diagnosed as acute pancreatitis. Study period was January 2018 to September 2019. And sample size was 30. Investigation was done in the department of Biochemistry.

Inclusion criteria: All diagnosed cases of acute pancreatitis admitted in the medical wards and ICU.

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Exclusion criteria: Cases with following association:- Stroke, CNS infection, CNS demyelination, Head injury, Acute coronary syndromes, Cardiogenic pulmonary edema, Established chronic liver disease.

Parameters to be studied: History, Complete physical examination, Routine laboratory investigations for various organ parameters, Routine and specific radiological investigations: Chest X ray, ABG analysis, CT thorax and USG thorax as when required.

Study tools: Patient, Proforma, standard tests- as mentioned and which was done usually for patient care.

Study techniques: the study is based on evaluation at 3 stages:

Day 1 of evaluation: History. Complete multiorgan specific systemic examination.

Laboratory investigations: Routine investigations like 1. Urea/creatinine. 2. LFT, Lipid profile

Specific investigations to be done in cases: 1 Serum amylase/lipase/LDH. 2. Total and ionized calcium. 3.USG whole abdomen. 4.CECT abdomen.

RESULTS

In the present study total 30 patients of acute pancreatitis were analysed. Majority of patients (14) were in the age group of 41-50 years among them 9 (30%) were male and 5 (16.7%) were female followed by 7 (23.3%) patients each in 20-30- and 31-40-years age group. We found that acute pancreatitis was found more common in males (63.3%) than females (36.7%) with a male female ratio of 1.72:1. The most common complication encountered was upper abdominal pain found among maximum 96.7 % (29) patients followed by shortness of breathing found in 86.7% (26) patients, rapid pulse found in 70% (21) patients, nausea among 66.7% (20) patients and vomiting in 60% (18) patients. This above discussion i.e. distribution of patients according to the chief complaints. The comorbidities we found among the study subjects and their distribution according to that. In the present study the most common comorbidity we found was alcoholism found among 73.3% (22) patients followed by other comorbidities like cigarette smoking found in 50% (15) patients, hyperlipidemia found in 40% (12) patients, gall stones found among 9 (30%) patients.

Table.1: Chest X- ray findings of acute pancreatitis patients

Chest X- ray		
	No of patients	**Percentage**
Atelectasis	1	3.3
Pleural Effusion	4	13.3
Pneumonia	2	6.7
Bilateral Opecity of lung	2	6.7
Normal	23	76.6

Table 2: USG findings of acute pancreatitis patients

USG findings		
	No of patients	**Percentage**
Interstitial edematous pancreatitis	2	6.7
Pancreatic Necrosis	4	13.3
Pancreatic Pseudocyst	4	13.3
Pancreas Volume is increased	20	66.7

Table 3: CT findings of acute pancreatitis patients

CT findings		
	No of patients	**Percentage**
Focal diffuse enlargement of the pancreas	3	10.0
Pancreatic changes and Peripancreatic inflammation	21	70
Single fluid collection	2	6.7
Pancreatic necrosis	4	13.3

Table 4: ABG findings of acute pancreatitis patients

ABG Findings						
	<60mm Hg		**≥60 – 75 mm Hg**		**≥75 – 100 mm Hg**	
PaO_2	No	%	No	%	No	%
	4	13.3	6	20.0	20	66.7
	35 – 45 mm Hg		**≥45 – 50 mm Hg**		**>50 mm Hg**	
$PaCO_2$	No	%	No	%	No	%

	20	66.7	4	13.3	6	20.0
		<7.35			**>7.35**	
pH	No	%			No	%
	4	13.3			26	86.7
HCO_3		**22-26 mEq/L**			**>26 mEq/L**	
	No	%			No	%
	26	86.7			4	13.3

Table 5: Biochemical Parametersof acute pancreatitis patients

Biochemical parameters				
Glucose	**<140 mg/dl**		**>140 mg/dl**	
	No of Pt.	%	No of Pt.	%
	18	60.0	12	40.0
Amylase	**200-400 U/L**		**>400 U/L**	
	No of Pt.	%	No of Pt.	%
	22	73.3	8	26.7
Lipase	100 - 160 U/L		>160 U/L	
	No of Pt.	%	No of Pt.	%
	21	70.0	9	30.0
Triglyceride	**200-300 mg/dl**		**>300 mg/dl**	
	No of Pt.	%	No of Pt.	%
	18	60.0	12	40.0
Ca^{++}	**<8.5 mg/dl**		**8.5 - 10.5 mg/dl**	
	No of Pt.	%	No of Pt.	%
	6	20.0	24	80.0
Na+	**<135 mEq/L**		**135 - 145 mEq/L**	
	No of Pt.	%	No of Pt.	%
	8	26.7	22	73.3
K+	**3.5 – 5.0 mEq/L**		**>5.0 mEq/L**	
	No of Pt.	%	No of Pt.	%
	25	83.3	5	16.7

DISCUSSION

According to previous studies, the pattern of morbidity and mortality in Acute Pancreatitis varied[113-115] The primary causes of death in Acute Pancreatitis remain controversial. A literature review reveals early mortality rates ranging from 0 to 80%. In present study, the early mortality rate was 13.3%. Aggressive restoration of multiple organ failure may be important to reduce early mortality rate. On the other hand, as shown in this study, the studied populations have consisted of groups of patients from a single department or ward rather than from the entire hospital population. This fact may explain the lower early mortality rate.

In the present study total 30 patients of acute pancreatitis were analysed. Majority of patients (14) were in the age group of 41-50 years among them 9 (30%) were male and 5 (16.7%) were female followed by 7 (23.3%) patients each in 20-30 and 31-40 years age group. We found that acute pancreatitis was found more common in males (63.3%) than females (36.7%) with a male female ratio of 1.72:1

The study of Jha PK *et al.*[9] found that, Maximum numbers of patients were females (65%) as compared to males (35%). with ratio of 1.8:1. This is significant as this disease appears more prevalent in females in contrast to previous study.

In this study, the comorbidities we found among the study subjects and their distribution according to that. In the present study the most common causes we found was alcoholism found among 73.3% (22) patients followed by other comorbidities like cigarette smoking found in 50% (15) patients, hyperlipidemia found in 40% (12) patients, gall stones found among 9 (30%) patients.

Another study of Jha PK *et al*[9], biliary pancreatitis was the most common cause of acute pancreatitis seen in 64 (63%) patients of acute pancreatitis, followed by alcohol in 28 (27%) patients, idiopathic in 6 (6%), in 3 (3%) patients traumatic pancreatitis was seen and in 1 case post infectious pancreatitis after mumps was seen.

Lankisch *et al.*[10] have observed, Atelectasis was seen in 15 (25.0%) patients and pulmonary consolidation in 4 (6.7%) patients at admission, and neither of the two had any significant correlation with the CTSI, respiratory failure or outcome . that 26% of their patients had pulmonary infiltrates and that there was a positive correlation between pulmonary infiltrates and the CTSI, Ranson's score and mortality. The biochemical parameters like blood glucose, lipase, amylase, triglyceride, Ca^{++}, Na^{+}, and K^{+} was

investigated and the readings were mentioned in the above table accordingly. Blood glucose level was high in 40% (12) patients and it was found normal in 60% (18) patients. All the patients showed a high amylase level in the investigation. 22 (73.3%) patients showed amylase level ranged between 200-400 U/L and 8 (26.7%) patients showed a very high amylase level i.e. >400 U/L. In case of lipase also most of the patients were observed with a high value. We found lipase level ranged between 100-160 U/L among 21 (70%) patients and the other 9 (30%) patients showed a very high lipase level (>160 U/L). During the investigation we found that triglyceride level was high in all the patients. Triglyceride ranged between 200-300 mg/dl was found in 18 (60%) patients and >300 mg/dl was observed in 12 (40%) patients. Low serum calcium (Ca^{++}) level (<8.5mg/dl) was observed in 6 (20%) patients and other 24 (80%) patients showed a normal serum calcium level (8.5- 10.5 mg/dl). In case of serum sodium (Na^{+}) level it was found to be low among 8 (26.7%) patients and other patients (22) showed normal serum sodium level. High potassium (K^{+}) level (>5.0 mEq/L) was observed among 5 (16.7%) patients and it was found to be normal in other 25 (83.3%) patients.

In this study,The biochemical parameters like blood glucose, lipase, amylase, triglyceride, Ca^{++}, Na^{+}, and K^{+} was investigated and the readings were mentioned in the above table accordingly. Blood glucose level was high in 40% (12) patients and it was found normal in 60% (18) patients. All the patients showed a high amylase level in the investigation. 22 (73.3%) patients showed amylase level ranged between 200-400 U/L and 8 (26.7%) patients showed a very high amylase level i.e.>400 U/L. In case of lipase also most of the patients were observed with a high value. We found lipase level ranged between 100-160 U/L among 21 (70%) patients and the other 9 (30%) patients showed a very high lipase level (>160 U/L). During the investigation we found that triglyceride level was high in all the patients. Triglyceride ranged between 200-300 mg/dl was found in 18 (60%) patients and >300 mg/dl was observed in 12 (40%) patients. Low serum calcium (Ca^{++}) level (<8.5mg/dl) was observed in 6 (20%) patients and other 24 (80%) patients showed a normal serum calcium level (8.5- 10.5 mg/dl). In case of serum sodium (Na^{+}) level it was found to be low among 8 (26.7%) patients and other patients (22) showed normal serum sodium level. High potassium (K^{+}) level (>5.0 mEq/L) was observed among 5 (16.7%) patients and it was found to be normal in other 25 (83.3%) patients.

Study of Bernard GR, *et al.*, Luhr OR, *et al.*, Milberg JA, *et al.*, Acute respiratory failure, including ALI and the more severe form, ARDS, has radiological findings with bilateral pulmonary infiltrates and physiological changes, normal cardiac filling pressures, and a ratio of arterial oxygen pressure and inspiratory oxygen concentration (PaO_2/FiO_2 < 300 mmHg for ALI and < 200 mmHg for ARDS, which reflects pronounced morphological changes).[134] ALI and ARDS frequently occur in critically ill patients, although the exact incidence in acute pancreatitis has not been stated. If we extrapolate Scandinavian data on ALI and ARDS patients, mortality in the United States is about 36 000 patients per year[135] More recent mortality rates have also been reported to be 30%-40% and higher in elderly patients.[136]

CONCLUSION

Ongoing research on acute pancreatitis and ARDS gives hope of improvement in the management of this severe and resource-demanding complication, that is still associated with substantial mortality. It seems that once hypotension is fully established, opportunities to ameliorate the disease state and reverse the situation are limited. This means that therapeutic efforts should be directed towards earlier phases of the disease. It is particularly important to understand the pathophysiological mechanisms that occur at the first phases of AP to avoid damage spreading out of the pancreas. A better understanding of the nature of cardiac dysfunction in this setting may allow more accurate diagnosis, prognostication, and management.

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