Studying the Risk Factors, Complications and Role of Diagnostics in Grading of Acute Pancreatitis Patients at Tertiary Care Centre

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ABSTRACT

Background: Acute pancreatitis is a leading gastrointestinal cause of hospitalization. Several conditions are associated with acute pancreatitis. Acute inflammatory changes of the pancreas, histologically accompanied by acinar cell destruction are some of the characteristics of acute pancreatitis. The clinical spectrum is as diverse as its causes & pathogenesis. Acute pancreatitis can range from relatively mild to severe with potentially life threatening complications. **Method:** The study was conducted at Department of surgery, Yenepoya Medical College and Hospital from 1st September 2019 to 30th September 2021. Patients with confirmed diagnosis of acute pancreatitis were included in the study. Data of 40 patients were collected in the form of history taking, physical examination, biochemical evaluation. Radiological investigations including ultrasound, CECT abdomen, and CA 19-9 will be considered depending on the indication. **Results:** Abdominal pain was the most common presenting complaint reported by almost all patients (98%), followed by vomiting in 13% of patients. Alcoholism was found to be the most common risk factor (75%), 15% had a history of gall stones. 50% of the patients had a CTSI score of 5to 8, 38% had a score of 4 and 13% had a score of 10. Pleural effusion was the most common complication accounting for 28% followed by pancreatic pseudocyst in 25 % of population. **Conclusion:** Alcoholism was found to be the most common cause for acute pancreatitis followed by gall stones. Abdominal pain was the mostcommon presenting complaint reported by almost all patients (98%). Complications occur in the form of pleural effusion, pancreatic pseudocyst, ascites and pancreatic necrosis. Laparotomy has a restricted role in treatment of pancreatitis.

Keywords: Acute pancreatitis, risk factors, complications, abdominal pain, gastrointestinal.

Introduction:

Acute pancreatitis involves an acute inflammatory process of the pancreas, with variable involvement of peri-pancreatic tissues and remote organ systems.[1] Acute pancreatitis is caused by the inappropriate release and activation of pancreatic enzymes. The pivotal enzyme in the activation of pancreatic zymogens is believed to be trypsin. The activationof trypsinogen to trypsin is inappropriate and the lack of prompt and proper pancreatic clearance of active trypsin leads to pancreatic inflammation and subsequent triggering of the inflammatory cascade. This leads to the release of cytokines including interleukin (IL)-1, IL-6, IL-8, tumour necrosis factor *a*, and platelet-activating factor. Consequently, the hepatic synthesis of acute phase reaction proteins such as C-reactive protein (CRP) is induced. Leukocyte migration and activation is thought to represent the major determining factor for both local and systemic complications. In most of the cases, recovery is uneventful but a proportion of these cases can go into associated complications like Systemic Inflammatory Response Syndrome (SIRS) leading to a fulminant course with pancreatic necrosis and Multiorgan DysfunctionSyndrome (MODS) finally leading to death.[2]

There is a well-documented association between increasing age and death from acute pancreatitis.[3] Complications of acute pancreatitis can be grouped under two headings.[4] Pancreatic which include Abscess, fat necrosis, haemorrhage, infected necrosis, pseudocyst formation, and sterile necrosis. Systemic which include acute kidney failure, acute liver failure, ARDS, disseminated intravascular coagulation, encephalopathy, gut ischemia, hypocalcaemia, paralytic ileus, shock. Respiratory complications, are most common complications seen in the context of acute pancreatitis. These complications vary from hypoxemia to Adult Respiratory Distress Syndrome (ARDS).The occurrence of local infection and multiple organ failure is attributed to the failure of gastrointestinal tract which enables the translocation of bacteria and endotoxins.[5] Consequently, the inflammatory changes from pancreas extend to the kidneys, stomach, colon and splenic vein. This may result in renal dysfunction, gastrointestinal bleeding, colitis and splenic vein thrombosis. Besides the systemic complications, local complications like fluid collection,ascites, pancreatic pseudocyst, pancreatic necrosis, and infective pancreatic necrosis are also seen.

CRP (C Reactive Protein) has been found to be a reliable, easily accessible, single marker for assessing severity.[6] Another important indicator is haematocrit ($\geq$ 44 % or failure of haematocrit to decrease at 24 hours following admission indicates severe acute pancreatitis in the early stage of the disease). Other markers include interleukin-6(IL-6), procalcitonin and interleukin-8 (IL-8). An elevated PCT level has been found to be an early predictor of severity, pancreatic necrosis and organ failure in patients with Acute Pancreatitis. Imaging plays an important role in both diagnosis and management of acute pancreatitis. As gallstones are one of the commonest causes for acute pancreatitis, trans- abdominal ultrasound is the most commonly used initial radiologic investigation of choice. Dynamic contrast enhanced CT (CECT), Magnetic Resonance Cholangiopancreatography (MRCP) and Endoscopic Ultrasound (EUS) are other important diagnostic techniques used in as diagnostic modalities of acute pancreatitis. Glasgow score, Ranson‘s score, APACHE score and Computed Tomography Severity Index (CTSI) have been used to assess acute pancreatitis. APACHE scoring system (Acute Physiology and Chronic Health Examination) II was developed for patients in intensive care.

It is clear that the concentrations of inflammatory mediators can be correlated to the severity of the disease, and if they are detected before the occurrence of multiple organ dysfunction, the early initiation of aggressive therapy might prevent its development. Hence, the study was conducted to understand the risk factors, complications and role of imaging in grading of acute pancreatitis.

Materials and Methodology

Study place- The study was conducted at Department of surgery, Yenepoya Medical College Hospital on

patients who were confirmed case of acute pancreatitis. The duration of the study was from 1st September 2019 to 30th September 2021.

Study design- Prospective observational study.

Inclusion criteria- Patients above 18 years of age, either gender, cases clinically consistent with the diagnosis of acute pancreatitis, and those willing to give a valid consent were included in the study.

Exclusion criteria- Those with chronic pancreatitis, recurrent pancreatitis, having acute on chronic pancreatitis, presence of malignancies and below 18 years of age and significant co-morbidities were excluded from the study.

Sample size- 40 patients were included in the study.

Data analysis- SPSS version 22.0 was used to evaluate the data. Percentages and fractions were obtained to depict the analyzed data where applicable. Descriptive statistics of the explanatory and outcome variables were calculated by the mean, standard deviation for quantitative variables, frequency and proportions for qualitative variables were ever needed.

Ethical considerations- Institutional ethical committee approval has been obtained before the initiation of the study.

Data of patients were collected in the form of history taking, physical examination, biochemical evaluation, ultrasound abdomen or CECT abdomen. Informed consent was taken from patients included in the study after explaining in detail about the study. Appropriate lab investigations including total count, serum amylase, serum lipase, LDH, LFT, RBS, RFT, calcium, CRP & other appropriate investigation will be performed. In addition appropriate radiological investigations including ultrasound, CECT abdomen, and CA 19-9 will be considered depending on the indication.

Results

Table 1: Age Distribution

Age distribution	No. of patients	Percentage of patients
Upto 25	6	15.00%
26-35	13	32.50%
36-45	16	40.00%
46-55	3	7.50%
>55	2	5.00%

Total of 40 patients were studied most of the patients were of the 36-45 years agegroup (40%)

Table 2: Sex distribution

Sex distribution	No. of patients	Percentage of patients
Males	36	90%
Females	4	10%

36 out 40 patient evaluated were males. Males accounted for 90 % of the cases.

Table 3: Risk factors

Risk factors	No. of patients	Percentage of patients
Alcoholism	30	75%
Gall stones	6	15%
None	4	10%

Most patients were alcoholic (75%), 15% had a history of gall stones and no riskfactors were noted only in 10% of the patients.

Table 4: CTSI score

CTSI score	No. of patients	Percentage of patients
4	15	38%
5 to 8	20	50%
10	5	13%

50% of the patients had a CTSI score of 5to 8, 38% had a score of 4 and 13% hada score of 10.

Table 5: Complications

Complication	No. of patients	Percentage of patients
Pleural effusion	11	28%
Pancreatic pseudocyst	10	25%
pancreatic necrosis	6	15%
pancreatic ascites	2	5%
No complications	16	40%

Pleural effusion was the most common complication found in patients of acute pancreatitis accounting for 28% of population studies followed by pancreatic pseudocyst in 25 % of population. In 40 % of population no complications were found.

Table 6: Outcomes

Outcomes	No. of patients	Percentage of patients
Discharged	37	92%
LAMA	2	5%
Death	1	3%

37 patients out of 40 (92%) patients improved clinically and discharged. 2 patients left against medical advice.

Discussion

While evaluating age distribution there was 15% of patients up to the age of 25, for the age group of 26-35 there was 32.50%, the age group of 36-45 showed the highest with 40% of patients, for 46-55 age group it was 7.50% and above 55 age group there was 5% of patients. Assessment of the sex distribution showed that 90% of the patients were males and 10% of patients were females. **Negi N et al.**[7] aimed to determine the incidence, etiology, severity, and outcome of acute pancreatitis. In this study, 123 patients were included- 89 men (72.35%) and 34 women (27.65%). Median age of presentation was 42 years. **Ahmed KU et al.**[8] in hospital based cross sectional descriptive study noted50cases with acute pancreatitis. Age range was 13-74 years, with a peak incidencein the 4th decade. Male to female ratio were 1.78:1.

Assessment of risk factor for the patients with alcoholism was maximum with 75%, those patients with gall stones history was 15% and no risk factor appeared for only 10% of the patients. **Negi N et al.**[7] noted that major etiological groups were alcohol 59.3%,gallstones 35.6%, post-endoscopic retrograde cholangio-pancreatography 0.8%, hyper-triglyceridemia 2.9%, autoimmune 0.8% and idiopathic 5 cases 4%. **Suthar K et al.**[9] noted alcohol identified as the most important etiologic factor associated with pancreatitis. **Jadhav SC et al.** [10] most common causes of AP observed were, gall stones, alcohol, idiopathic, trauma and hypertriglyceridemia out of which gall stone was the commonest cause (41%). 50% of the patients had a CTSI score of 5 to 8, 38% of the patients had a score of4 and 13% of the patients had a score of 10. When complications were evaluated 28% of the patients showed pulmonary effusion, 25% showed pancreatic

pseudocyst, 15% showed pancreatic necrosis with 5% showed pancreatic ascites and 40% of the patients appears to have no complications. Outcomes revealed that 93% (37) of the patients were discharged, 6% (2) of the patient left against medical advice (LAMA) and 3% (1) patient died. **Negi N et al.**[7] noted that mortality was seen in 5.7% patients. **Suthar K et al.** [9] noted that CT grading system can identify patient at higher risk of mortality more accurately than clinical grading system; on other hand clinical grading system identify patient at risk of organ failure and requiring intensive care admission more accurately. **Jadhav SC et al.** [10] noted that Pleural effusion, Pseudo cyst of pancreas, Shock,ARDS, MODS and death were the commonest complications observed in their study. Out of which pleural effusion (30%) was the commonest complication observed in study. The morality rate was 24%.

Conclusion

Acute pancreatitis is commonly seen between 36-45 years of age. There is male predisposition in patients suffering from acute pancreatitis. Alcoholism is the commonest antecedent factor for acute pancreatitis.

50% of the patients had a CTSI score of 5 to 8, 38% had a score of 4 and 13%had a score of 10.Complications are common in the form of pleural effusion, pancreatic pseudo cyst, ascites and pancreatic necrosis. Hence, it is always prudent to be careful and follow up regarding complications as these are seen in almost 60% of the subjects. Death rate was observed to be 3% from our study.

Limitations of the Study

Limitations of our study included study sample was small to extrapolate to regionaland national level trends. Patients below 18 years of age and those with recurrent pancreatitis, chronic pancreatitis and acute on pancreatitis were not included in the study. The female representation in the study was small. Long term follow-up beyond discharge, cost analysis and average health expenditure of the admission and pharmacotherapy of the patients was not described.

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