

Role of Imaging in Patients with Acute and Chronic Pancreatitis

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ABSTRACT

Background: One of the most frequent emergency conditions that patients bring to the hospital is pancreatitis; in some situations, the condition worsens quickly, while in others, it is moderate and self-limiting. It becomes imperative to conduct rapid assessment in order to prevent potentially disastrous outcomes. Radiological imaging and laboratory investigations are necessary for diagnosis. Organ and soft tissue structure imaging is diagnosed and evaluated using ultrasonography. The present study was undertaken to compare the role of ultrasonography (USG) and computed tomography (CT) in patients with acute and chronic pancreatitis.

Materials and Methods: Patients were examined using Ultrasound and CT scan as imaging modalities after obtaining consent for the same. Patient with relevant clinical history were examined. Serum amylase, serum lipase and standing/supine abdominal radiographs were correlated with the imaging findings as and when required.

Results: In the present study, we enrolled a total of 100 cases of acute and chronic pancreatitis based on inclusion and exclusion criteria. The age wise distribution of the patients showed that 12%, 28%, 24% and 36% were in the age group 11-20, 21-30, 31-40 and 41-50 years. Out of 100 patients 72 were males and 28 were females. The clinical presentation in acute pancreatitis showed that 58%, 44%, 52% and 16% presented with abdominal pain, fever, vomiting and weight loss. Similarly the clinical presentation in chronic pancreatitis showed that 48%, 16%, 36% and 18% presented with abdominal pain, fever, vomiting and weight loss respectively. The most common clinical presentation was abdominal pain in acute pancreatitis and chronic pancreatitis as represented in Table 1. Biochemical evaluation was done in both acute and chronic pancreatitis patients, it is seen that serum amylase was elevated in 60% and lipase in 68% in acute pancreatitis patients and similarly serum amylase was elevated in 64% and lipase in 76% in chronic pancreatitis patients as represented in Table 2. All the patients subjected to ultrasonography and CT abdomen, to assess the lesions. Ultrasonographic evaluation revealed 10% had normal findings, 20% had obscured, 6% had Acute edematous pancreatitis, 4% had Acute on chronic pancreatitis, 5% had Acute pancreatitis with peripancreatic fluid collection, 5% had Acute pancreatitis with pseudocyst, 34% had chronic pancreatitis, 10% had chronic pancreatitis with pseudocyst and 6% had pseudocyst. CT abdomen shows that 12% had acute edematous pancreatitis, 10% had acute necrotizing pancreatitis, 12% had acute pancreatitis with pseudocyst, 10% had acute pancreatitis with other complications, 32% had chronic pancreatitis, 12% had chronic pancreatitis with pseudocyst and 6% had pseudocyst.

Conclusion: In the primary care context, clinical signs from the patient's history and presentation of abdominal pain are easily misinterpreted for any acute abdomen disease, delaying the diagnosis of a particular pancreatic pathology. Additionally, although highly specific for pancreatic diseases, several blood tests, such as serum lipase and amylase, can be normal in the early stages in some

people. Similar to this, ultrasonography is less expensive, non-invasive, and radiation-free, but it has specific limitations that result in low visibility that might be deceptive. As a result, CECT Abdomen can identify the majority of results pertaining to pancreatic diseases. CECT of the abdomen should ultimately be beneficial for all individuals with a clinical suspicion of pancreatic pathology. Ultrasonography is a quick, easy, affordable, and safe method that uses no hazardous radiation for the imaging and diagnosis of pancreatic diseases. Due to its limitations, ultrasound may not be able to detect vascular problems and extra-pancreatic spread of inflammation. In the diagnosis and staging of acute or chronic pancreatic diseases, CECT serves as a confirmatory examination. Changes in dimensions and echogenicity were the most typical Ultrasonography result.

Key-words: acute pancreatitis, chronic pancreatitis, ultrasonography, computed tomography and pseudocyst.

INTRODUCTION

One of the most frequent emergency conditions that patients bring to the hospital is pancreatitis; in some situations, the condition worsens quickly, while in others, it is moderate and self-limiting. It becomes imperative to conduct rapid assessment in order to prevent potentially disastrous outcomes. Radiological imaging and laboratory investigations are necessary for diagnosis. Organ and soft tissue structure imaging is diagnosed and evaluated using USG [1]. Ultrasound imaging is gradually becoming more important in pancreas evaluation due to its non-invasive nature and ongoing advancements in imaging quality. It can rule out other possible causes of stomach pain and identify pancreatitis. Most of the time, USG can diagnose pancreatitis thanks to technological advancements and growing operator experience. With a slice thickness of 0.5 mm, numerous detector rows, increased spatial resolution, and 3D reformatting to clearly define anatomy, the 4 MDCT (multi detector CT) scans 20 times quicker. It allows for the use of iodinated contrast agent in the arterial, pancreatic, and portal venous phases [2].

MATERIALS AND METHODS

Study site

This study was conducted at the Department of Imaging, at our tertiary care hospital.

Study population

Ultrasound and CT confirmed cases of acute and chronic pancreatitis were included in the study.

Study design

Observational cross-sectional Study.

Inclusion Criteria

Suspected and already diagnosed cases of acute and chronic pancreatitis of both genders in the age group 20-50 years referred to radiodiagnosis department, willing to give informed consent were included in the study.

Exclusion Criteria

Pregnant women and those patients with elevated baseline creatinine levels $>1.5\text{mg/dL}$ were excluded from the study.

Data collection: Patients were examined using Ultrasound and CT scan as imaging modalities after obtaining consent for the same. Patient with relevant clinical history were examined. Serum amylase, serum lipase and standing/supine abdominal radiographs were correlated with the imaging findings as and when required.

Statistical Analysis

Statistical evaluation was performed by statistical package for the social sciences (SPSS) version 17. Data was presented as tables, bar diagrams and pie charts. For statistical calculations, Student's independent sample two-tailed t-test and chi square test was used. A p value <0.05 was considered statistically significant.

RESULTS

Table 1: Shows demographic and clinical presentation of study subjects

Variables	Number of Patients 100
Age (years)	
11-20 years	12 (12%)
21-30 years	28 (28%)
31-40 years	24 (24%)
41-50 years	36 (36%)
Males	72 (72%)
Females	28 (28%)
Acute Pancreatitis	
Abdominal pain	29 (58%)
Fever	22 (44%)
Vomiting	26 (52%)
Weight loss	16 (32%)
Chronic Pancreatitis	
Abdominal pain	24 (48%)
Fever	8 (16%)
Vomiting	18 (36%)
Weight loss	9 (18%)

Table 2: Status of biochemical markers in acute and chronic pancreatitis

Variables	Number of Patients
Acute Pancreatitis (n= 50)	
Elevated serum amylase	30 (60%)
Elevated serum lipase	34 (68%)
Chronic Pancreatitis (no 50)	
Elevated serum amylase	32 (64%)
Elevated serum lipase	38 (76%)

Table 3: Imaging studies in acute and chronic pancreatitis

USG diagnosis of lesions		CT diagnosis of lesions	
Diagnosis	Frequency	Diagnosis	Frequency
Normal	10 (10%)	Acute edematous pancreatitis	12 (12%)
Obscured	20 (20%)	Acute necrotizing pancreatitis	10 (10%)
Acute edematous pancreatitis	6 (12%)	Acute pancreatitis with pseudocyst	12 (24%)
Acute on chronic pancreatitis	4 (8%)	Acute pancreatitis with other complications	10 (20%)
Acute pancreatitis with peripancreatic fluid collection	5 (10%)	Acute on chronic pancreatitis	6 (12%)
Acute pancreatitis with pseudocyst	5 (10%)	Chronic pancreatitis	32 (64%)
Chronic pancreatitis	34 (68%)	Chronic pancreatitis with pseudocyst	12 (24%)
Chronic pancreatitis with pseudocyst	10 (20%)	Pseudocyst	6 (12%)
Pseudocyst	6 (12%)		

DISCUSSION

In the present study, we enrolled a total of 100 cases of acute and chronic pancreatitis based on inclusion and exclusion criteria. The age wise distribution of the patients showed that 12%, 28%, 24% and 36% were in the age group 11-20, 21-30, 31-40 and 41-50 years. Out of 100 patients 72 were males and 28 were females. The clinical presentation in acute pancreatitis showed that 58%, 44%, 52% and 16% presented with abdominal pain, fever, vomiting and weight loss. Similarly the clinical presentation in chronic pancreatitis showed that 48%, 16%, 36% and 18% presented with abdominal

pain, fever, vomiting and weight loss respectively. The most common clinical presentation was abdominal pain in acute pancreatitis and chronic pancreatitis as represented in Table 1. Biochemical evaluation was done in both acute and chronic pancreatitis patients, it is seen that serum amylase was elevated in 60% and lipase in 68% in acute pancreatitis patients and similarly serum amylase was elevated in 64% and lipase in 76% in chronic pancreatitis patients as represented in Table 2. All the patients subjected to ultrasonography and CT abdomen, to assess the lesions. Ultrasonographic evaluation revealed 10% had normal findings, 20% had obscured, 6% had Acute edematous pancreatitis, 4% had Acute on chronic pancreatitis, 5% had Acute pancreatitis with peripancreatic fluid collection, 5% had Acute pancreatitis with pseudocyst, 34% had chronic pancreatitis, 10% had chronic pancreatitis with pseudocyst and 6% had pseudocyst. CT abdomen shows that 12% had acute edematous pancreatitis, 10% had acute necrotizing pancreatitis, 12% had acute pancreatitis with pseudocyst, 10% had acute pancreatitis with other complications, 32% had chronic pancreatitis, 12% had chronic pancreatitis with pseudocyst and 6% had pseudocyst. Silverstein et al study a prospective study done on 102 patients consecutively to determine role of USG and CT scan in pancreatitis. Our present study included 50 patients who underwent USG as well as CT scan examination with 38 (76%) males and 12 (24%) females, with males being more affected than females. Of these most patients were of age 41-50 of being 17 (34%) patients' findings like that of Silverstein et al of 65 among 102 patients [3]. Alcohol and gall stones are major etiological agents in pancreatitis. O'Connor et al study approximates 70% etiology of pancreatitis due to gall stones and alcohol. Silverstein et al study had 57 patients with alcohol history and 6 with gall stones in comparison to present study which had 23 and 4 patients respectively [4]. The advantages of USG are its easy accessibility, non-invasive nature and it is radiation free. Its less time consuming so in emergency situations when the patients' conditions is rapidly declining it is easily used as an initial diagnostic tool. But in emergency majority of patients in present study presented with acute abdominal pain who are in distress with a rigid abdomen at times and with a poor general condition. USG of which 30% patients were either examined to a suboptimal level or diagnosed to have normal gland. This leads to a diagnostic dilemma and a follow up CT Scan becomes mandatory for the patient.

CONCLUSION

In the primary care context, clinical signs from the patient's history and presentation of abdominal pain are easily misinterpreted for any acute abdomen disease, delaying the diagnosis of a particular pancreatic pathology. Additionally, although highly specific for pancreatic diseases, several blood tests, such as serum lipase and amylase, can be normal in the early stages in some people. Similar to this, ultrasonography is less expensive, non-invasive, and radiation-free, but it has specific limitations that result in low visibility that might be deceptive. As a result, CECT Abdomen can identify the majority of results pertaining to pancreatic diseases. CECT of the abdomen should ultimately be beneficial for all individuals with a clinical suspicion of pancreatic pathology. Ultrasonography is a quick, easy, affordable, and safe method that uses no hazardous radiation for the imaging and diagnosis of pancreatic diseases. Due to its limitations, ultrasound may not be able to detect vascular problems and extra-pancreatic spread of inflammation. In the diagnosis and staging of acute or chronic pancreatic diseases, CECT serves as a confirmatory examination. Changes in dimensions and echogenicity were the most typical Ultrasonography results.

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