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Profile and Endoscopic Ultrasonography findings in Chronic Pancreatitis patients

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Abstract

Background: To assess endoscopic ultrasonography findings in chronic pancreatitis patients. **Materials & Methods:** Seventy- two cases of chronic pancreatitis of both genders were enrolled in the study. Parameters such as age, sex, abdominal symptoms was recorded. Abdominal symptoms were defined as including abdominal or back pain/discomfort, weight loss, appetite loss, and jaundice. The diagnosis of chronic pancreatitis was established if there was evidence of pancreatic calcification on abdominal ultrasonography. **Results:** Maximum cases were seen in age group 20-35 years (males- 26, females- 15) followed by 35-50 years (males- 16, females- 15). Common clinical findings were pain in 58, calcification in 12, diarrhea in 35, jaundice in 23, lump in 17, vomiting in 40 and GI bleed in 32. A significant difference was observed (P< 0.05). Parenchymal features were hyperechoic foci with shadowing in 60, lobularity with honeycombing in 54, hyperechoic foci without shadowing in 36, stranding (Minor): hyperechoic lines ≥3 mm in length in 48. Ductal features were main pancreatic duct (MPD) calculi in 71, irregular MPD contour in 23, dilated side branches in 15, main pancreatic duct dilatation in 38 and hyper echoic duct margin in 44. A non-significant difference was observed (P> 0.05). **Conclusion:** Endoscopic ultrasound is the most sensitive imaging modality for diagnosing pancreatic disorders, it can demonstrate subtle alterations in the pancreatic parenchymal and ductal structure even before traditional imaging and functional testing demonstrate any abnormality.

Keywords: Chronic pancreatitis, Endoscopic ultrasound, hyperechoic lines, Pancreatic duct

INTRODUCTION

Endoscopic ultrasound (EUS) has been used for the diagnosis of chronic pancreatitis (CP) for over two decades. Its primary attribute is its ability to detect mild parenchymal and ductal abnormalities not seen with computed tomography (CT) scans.[1] EUS is of most use in patients with abdominal pain of suspected pancreatic origin and non-diagnostic cross-

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sectional imaging. In a report entitled "Minimal change chronic pancreatitis."[2]

The pancreas is well assessed by EUS due to the method's high resolution and the proximity of the transducer to the pancreas with the possibility of avoiding air in the gut.[3] In patients with CP, EUS was performed initially for diagnosis, then for differential diagnosis, and later for therapeutic purpose.[4]Clinical experience suggests that evidence of chronic pancreatitis (CP) is frequently identified in the background pancreatic parenchyma of IPMN patients by EUS (EUS-CP findings). CP is a well-known risk factor for pancreatic malignancy, including pancreatic ductal adenocarcinoma. However, the relationship between malignant transformation of IPMNs and pathological changes of the pancreatic parenchyma, such as atrophy, inflammation, and fibrosis, remains unclear.[5]

Walsh described 16 patients with typical pancreatic pain and negative or equivocal CT and endoscopic retrograde cholangiopancreatography (ERCP) images.[6] All patients underwent pancreatic resection due to a strong suspicion of CP. Despite its advantage of assessing the pancreas at very close range, EUS, being operator dependent, is still imperfect in establishing the diagnosis of chronic pancreatitis.[7] The various pathological aspects of the disease are shown as different EUS features, and the same importance for diagnosis has been attributed to all of them. There have been several attempts to define the disease on ductal and parenchymal criteria, initially embracing 11 criteria.[8] Considering this, the present study aimed at assessing endoscopic ultrasonography findings in chronic pancreatitis patients.

MATERIALS & METHODS

Seventy- two cases of chronic pancreatitis of both genders were enrolled in the study. Enrolment of all patients into the study was done with the written consent. Ethical approval for the study was obtained beforehand.

A detailed history such as family history, alcohol consumption, and presence and severity of abdominal pain was recorded. All the patients were subjected to a thorough clinical examination, routine hematologic and biochemical investigations and abdominal ultrasonography. Parameters such as age, sex, abdominal symptoms, serum CEA (10 mm) was recorded. Abdominal symptoms were defined as including abdominal or back pain/discomfort, weight loss, appetite loss, and jaundice. The diagnosis of chronic pancreatitis was established if there was evidence of pancreatic calcification on abdominal ultrasonography. The patients with ICP were divided into early-onset and late-onset ICP depending on the age of onset of symptoms (before or after age of 35 years). Results of the present study after recording all relevant data were subjected for statistical inferences using chi- square test. The level of significance was significant if p value is below 0.05 and highly significant if it is less than 0.01.

RESULTS

Table 1: Age and gender distribution

Age groups (years)	Male	Female	Total
20-35	26	15	41

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35-50	16	15	31
Total	42	30	72

Maximum cases were seen in age group 20-35 years (males- 26, females- 15) followed by 35-50 years (males- 16, females- 15) (Table 1).

Table 2: Assessment of clinical features

Clinical features	Number	P value
Pain	58	<0.05
Calcification	12	
Diarrhea	35	
Jaundice	23	
Lump	17	
Vomiting	40	
GI bleed	32	

Common clinical findings were pain in 58, calcification in 12, diarrhea in 35, jaundice in 23, lump in 17, vomiting in 40 and GI bleed in 32. A significant difference was observed (P< 0.05) [Table 2, Figure 1].

Graph I: Assessment of clinical features

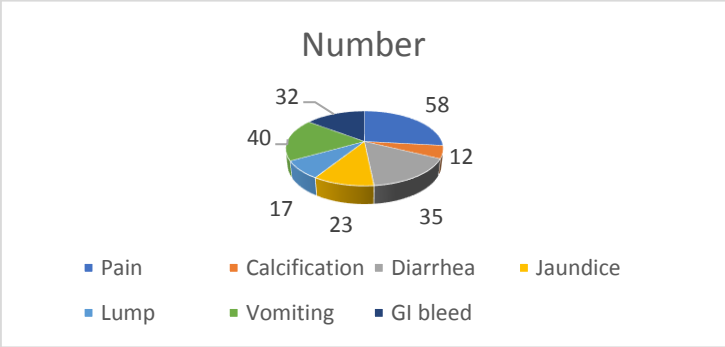

Table 3: Endoscopic Ultrasound features of chronic pancreatitis

Tissue	Features	Number	P value
Parenchymal features	Hyperechoic foci with shadowing	60	<0.05
	Lobularity with honeycombing	54	
	Hyperechoic foci without shadowing	36	
	Stranding (Minor): Hyperechoic lines ≥3 mm in length	48	
Ductal features	Main pancreatic duct (MPD) calculi	71	<0.05
	Irregular MPD contour	23	
	Dilated side branches	15	
	Main pancreatic duct dilatation	38	
	Hyper echoic duct margin	44	

Parenchymal features were hyperechoic foci with shadowing in 60, lobularity with honeycombing in 54, hyperechoic foci without shadowing in 36, stranding (Minor): hyperechoic lines ≥3 mm in length in 48. Ductal features were main pancreatic duct (MPD) calculi in 71, irregular MPD contour in 23, dilated side branches in 15, main pancreatic duct dilatation in 38 and hyper echoic duct margin in 44. A non- significant difference was observed (P> 0.05) (Table 3).

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DISCUSSION

Chronic pancreatitis is characterized by irreversible damage to the pancreas that eventually leads to pain and/or exocrine and endocrine insufficiency.[9] It is a major health problem worldwide and is associated with considerable morbidity. In spite of a large number of reports on chronic pancreatitis, it remains a fascinating process of uncertain pathogenesis, unpredictable clinical course, and unclear treatment.[10] Although alcohol is an important cause of chronic pancreatitis, in a large proportion of patients with chronic pancreatitis, no etiology can be identified, and they are labeled as having idiopathic chronic pancreatitis (ICP).[11]The present study aimed at assessing endoscopic ultrasonography findings in chronic pancreatitis patients.

We found that maximum cases were seen in age group 20-35 years (males- 26, females- 15) followed by 35-50 years (males- 16, females- 15). Takenaka et al,[12] investigated whether background EUS-CP findings were associated with malignant IPMN. The clinical data of 69 consecutive patients with IPMNs who underwent preoperative EUS and surgical resection between April 2010 and October 2014 were collected prospectively. The association of EUS-CP findings (total number of EUS-CP findings; 0 vs. ≥ 1) with invasive IPMN was examined. The association of EUS-CP findings with pathological changes of the background pancreatic parenchyma (atrophy/inflammation/fibrosis) was also examined. Results: Among patients with EUS-CP findings, invasive intraductal papillary mucinous carcinoma (IPMC) was significantly more frequent than among patients without EUS-CP findings (42.5% [17/40] vs. 3.4% [1/29], p = 0.0002). In addition, patients with EUS-CP findings had higher grades of pancreatic atrophy and inflammation than patients without EUS-CP findings (atrophy: 72.5% [29/40] vs. 34.5% [10/29], p = 0.003; inflammation: 45.0% [18/40] vs. 20.7% [6/29], p = 0.04).

We observed that Common clinical findings were pain in 58, calcification in 12, diarrhea in 35, jaundice in 23, lump in 17, vomiting in 40 and GI bleed in 32. Parenchymal featureswere hyperechoic foci with shadowing in 60, lobularity with honeycombing in 54, hyperechoic foci without shadowing in 36, stranding (Minor): hyperechoic lines ≥3 mm in length in 48. Ductal features were main pancreatic duct (MPD) calculi in 71, irregular MPD contourin23,dilated side branches in 15, main pancreatic duct dilatation in 38 and hyper echoic duct margin in 44.Bhasin et al,[13] in their study ultrasonography and computed tomography were performed on all patients. Magnetic resonance cholangiopancreatography, endoscopic retrograde cholangiopancreatography, glucose tolerance tests, and fecal fat studies were performed on some patients. Patients were divided into groups based on early- or late-onset ICP (before or after 35 years of age). ICP was reported in 41.3% of patients and alcoholic chronic pancreatitis in 38.1%. The mean age of ICP patients was 33.0 ± 13.0 years and the mean duration of symptoms at the time of presentation was 40.2 ± 34.4 months. Pain was the dominant symptom in patients with early- (95.1%) and late-onset (100%) ICP; pseudocyst was the most common local complication. Diabetes was observed in 17.1% of patients with early-onset ICP and 34.8% with late-onset ICP. Pancreatic calcification was noted in 46.3% of patients with early-onset and 47.8% with late-onset ICP. Pseudocyst and segmental portal hypertension occurred more frequently in non-calcific ICP, whereas diabetes mellitus

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and abnormal fecal fat excretion occurred more frequently in patients with calcific ICP.

Layer et al,[14]had reported that in the United States there is a bimodal distribution of ages at the onset of symptomatic disease in patients with ICP, and they divided them into 2 major forms of ICP, early-onset and late-onset ICP (onset before and after 35 years of age, respectively). Early-onset ICP was characterized by a long course of severe abdominal pain, but calcification and exocrine and endocrine insufficiency developed more slowly than in late-onset ICP. When we divided the ICP patients into early-onset and late-onset ICP, it was noted that the median age at presentation in early-onset and late-onset ICP was found to be 23 and 44 years, respectively, whereas Layer et al found the median age to be 19.2 and 56.2 years, respectively. Early-onset ICP of North India in contrast to that of the West was also found to have significant male preponderance ($P < .05$) and lower frequency of exocrine insufficiency ($P < .05$). Also in contrast to absence of pain in a significant number of patients with late-onset ICP in the West, pain was observed in all of our patients with late-onset ICP ($P < .05$). Exocrine insufficiency was seen in significantly more patients with late-onset ICP in the West in comparison to late-onset ICP in the current study ($P < .0001$).

CONCLUSION

Endoscopic ultrasound is the most sensitive imaging modality for diagnosing pancreatic disorders, it can demonstrate subtle alterations in the pancreatic parenchymal and ductal structure even before traditional imaging and functional testing demonstrate any abnormality.

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