ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 16, Issue 7, 2023

Online - 2455-3891
Print - 0974-2441

Research Article

A CLINICAL PROSPECTIVE STUDY OF CHRONIC PANCREATITIS

PURUSHOTHAM G, HIMABINDHU P, GOWTHAMI P, JAHNAVI M*

Department of General Surgery, Sri Venkateswara Medical College, Tirupati, Andhra Pradesh, India. Email: jan.rdy@gmail.com

Received: 18 February 2023, Revised and Accepted: 06 June 2023

ABSTRACT

Objective: Chronic pancreatitis (CP) is a relentlessly progressive fibroinflammatory process, resulting in the destruction of endocrine and exocrine elements, which may eventually lead to pancreatic insufficiency. Although previous reports on the treatment of CP have yielded considerable data, our study hopes to give validation on managing CP patients conservatively with confidence.

Methods: This study was conducted in the Department of General Surgery, SVRRGGH, affiliated with Sri Venkateswara Medical College Tirupati. The materials for the study were collected from patients presenting to the surgery outpatient department and emergency room with the features of CP during the period of March 2020–April 2021 were included in the study.

Results: The incidence is high in patients of age group 44.46±9.16, of which 63.3% were males and 36.7% were females. The most common presenting symptom was pain abdomen. All the data were statistically analyzed using software, namely SPSS 21.0 and Instat. Microsoft Word and Excel have been used to generate tables and graphs. Results on continuous measurements are presented on Mean±SD, and results on categorical measurements are presented in number (%).

Conclusion: Conservative management shows 100% pain relief, 33.3% had steatorrhea, while surgical management shows 80% pain relief and 80% steatorrhea. Hence patients with CP can be treated effectively with conservative management.

Keywords: Chronic pancreatitis, Lateral pancreatojejunostomy, Conservative management, Surgical management.

 DOI: http://dx.doi.org/10.22159/ajpcr.2023v16i7.48460. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

Chronic pancreatitis (CP) is a relentlessly progressive fibroinflammatory process, resulting in the destruction of endocrine and exocrine elements, which may eventually lead to pancreatic insufficiency. The prevalence of CP in southern India is 114–200/100000 population. The history of CP is variable, making treatment decisions difficult, and it is associated with intractable pain, pseudocyst formation, fistula formation, obstructive jaundice, intestinal obstruction, and hemorrhage. With or without treatment, all patients who have smoldering CP ultimately suffer from progressive exocrine insufficiency and diabetes.

Some studies show that early surgical intervention in the management of CP patients may lead to an increase in morbidity and mortality. Although previous reports on the treatment of CP have yielded considerable data, our study hopes to give the validation on managing CP patients conservatively with confidence.

METHODS

This clinical prospective study was conducted in the Department of General Surgery, SVRRGGH, Tirupati. A total of 30 cases were collected from patients presenting to the surgery outpatient department and emergency room with the features of CP from March 2020 to April 2021. The criteria of the selection of cases were based on clinical history, physical findings, and radiological and hematological investigations.

Inclusion criteria

All patients with clinical and radiological diagnosis of CP with age 18–60 years.

Exclusion criteria

Pregnant women, patients with CP associated with chronic renal disease.

Informed written consent to participate in the study as well as for investigative procedures was taken. A pre-structured pro forma was used to collect the baseline data. After admission to the hospital, detailed clinical, biochemical, and radiological investigations were evaluated and recorded; and the patients were managed accordingly.

Details of intraoperative findings and operative procedure records were maintained. Immediate post-operative outcomes, including complications and its management, were also considered into account. Patients were followed up in set of intervals.

Statistical analysis

Statistical software, namely SPSS 21.0 and Instat, were used for the analysis. Of the data and Microsoft Word and Excel have been used to generate tables and graphs. Results on continuous measurements are presented on Mean±SD and results on categorical measurements are presented in number (%).

RESULTS

In the present study, the mean age of the population was 44.46±9.16. Of which 33.3% were in 31–40 years, 36.7% were 41–50 years and 51–60 years in 30%. Based on gender, 63.3% were male and 36.7% were female. Based on socioeconomic status 50% were in the lower class and 50% were in the middle class. Based on duration in years, 56.7% had duration of 1–5 years, 30% had duration of 6–10 years, and 13.3% had duration of >11 years. The mean duration in years in the present study was 4.93±3.53 years.

Based on the history of presenting illness, site of pain was epigastrium (EG) (40%), EG+lefthypochondrium (LH) (20%), LH (40%). 100% had dull nature on examination. 76.7% had radiation to the back. Fatty food act as aggravating factor and medication as relieving factor in all patients. 20% had loss of weight, 63.3% had nausea and vomiting.

Based on ultrasound (US) findings, increased echogenicity was seen in 60%, where 66.7% showed dilated and irregular main pancreatic duct (MPD), 36.7% showed focal calcification, 56.7% showed atrophy, 10% showed biliary tree and 6.7% show free fluid.

CECT abdomen shows 100% HPD, 60% show dilated and irregular MPD, parenchymal calcification in 33.3%, focal MPD calcification in 13.3%, atrophy in 53.3%, and pseudocyst in 6.7%.

MRCP findings show HPD in 100%, 60% had dilated and irregular MPD, 40% had parenchymal calcification, 16.7% had Focal MPD calcification, and 60% had atrophy.

Out of 10 patients on surgical management, 60% underwent lateral pancreatojejunostomy, 20% underwent local resection of head - Lateral pancreatojejunostomy, 10% had local resection of head - lateral pancreatojejunostomy + common bile duct (CBD) exploration and 10% had local resection of head - lateral pancreatojejunostomy + cystogastrostomy.

Conservative management shows 100% pain relief, 33.3% had steatorrhea. Surgical management shows 80% had pain relief and 80% had steatorrhea.

DISCUSSION

The mean age of the study population in years was 44.46±9.16 correlated to a study conducted by Bhimwal *et al.* [1] that out of a total of 50 cases, the maximum cases were of age group 30–39 years (32.5%) followed by 25% in the age group of 50–59. In a study by Balaji *et al.* [2], the mean age of the patients was 45.4 years (range 30–69 years).

Male-to-female ratio in acute pancreatitis was 1.7:1 (25 males, 15 females) and in CP 4: 1 (8 males, 2 females). Study findings were in correlation with that of McEntee *et al.* [3], where the mean age is 42.4 years (range 20–69 years), whereas the study by Corfield *et al.* has shown the mean age to be 60 years (range 3–94 years). In study by Gillespie *et al.* [4] where it is 2:1.9. In CP male: female ratio is 4:1 (8 males, 2 females), which was contrary to the study by Balaji *et al.* where the sex-ratio was 1:1.8 [2]. Panda *et al.* conducted a study on the mean age of presentation in population was 3rd–4th decade, and male outnumbered female in both the groups which were also reported in studies from the north and south India (Table 1) [5-7].

Based on history of presenting illness, site of pain was EG (40%), EG+LH (20%), LH (40%). 100% had dull nature on examination. 76.7% had radiation to back. Fatty food act as aggravating factor and medication as relieving factor in all patients. 20% had loss of weight, 63.3% had nausea and vomiting. Only 16.7% had Jaundice, and 6.6% had Hematemesis and Malena (Table 2).

Bhimwal *et al.* [1] study reported that previous history of abdominal pain in all cases is present, followed by epigastric pain (90%), nausea and vomiting (80%), weight loss (60%), fever (30%), diarrhea (30%) and diabetes (20%) of cases. 92.5% (37) of cases were mild, and 7.5% (3) were severe acute pancreatitis.

There is evidence that there is a link between CP and pancreatic cancer (PC). Aside from the fact that smoking and drinking may be an independent risk factor for PC, it has been demonstrated that the risk for PC is higher in the case of clinically proven CP than in the general population [4]. According to HPSG multicentre data collection and analysis of pancreatic tumors (PC), the ratio of the presence of CP in the case of PC was 3.7% [5].

Although CP is thought to be a multifactorial disease, alcohol consumption is the most common cause of CP in adult patients, with the exception of South India and China, where idiopathic pancreatitis was the most common cause [6]. A multicentre study from Italy showed that 34% of CP cases were caused by excessive alcohol consumption [7]. That figure was 65.4% in the Czech Republic [8], 44% in the US, 95% in Australia, and 54% in Japan [7].

The role of smoking and alcohol consumption as risk factors for developing CP is well-examined, although the effect on the course of the disease is still unclear. Studies have shown that continuous smoking increases the risk of pancreatic calcification in alcohol-related and

Table 1: Demographic distribution of present study

Variables	Frequency (%)
Age in years	
31–40	10 (33.3)
41–50	11 (36.7)
51–60	9 (30)
Total	30 (100)
Mean±SD	44.46±9.16
Gender	
Male	19 (63.3)
Female	11 (36.7)
Socioeconomic status	
Lower class	15 (50)
Middle class	15 (50)
Duration (years)	
1–5	17 (56.7)
6–10	9 (30)
>11	4 (13.3)
Total	30 (100)
Mean±SD	4.93±3.53

SD: Standard deviation

Table 2: History of presenting illness

Variables	Frequency (%)
Site	
Epigastrium	12 (40)
Epigastrium+left hypochondrium	6 (20)
Left hypochondrium	12 (40)
Dull nature	30 (100)
Radiation to back	23 (76.7)
Fatty food as aggravating factor	30 (100)
Medication as relieving factor	30 (100)
Loss of weight	
Yes	6 (20)
No	24 (80)
Nausea and vomiting	
Yes	19 (63.3)
No	11 (36.7)

Table 3: Ultrasound findings

Variables	Frequency (%)
Increased echogenicity	
Yes	18 (60.0)
No	12 (40.0)
Dilated and irregular MPD	
Yes	20 (66.7)
No	10 (33.3)
Focal calcification	
Yes	11 (36.7)
No	19 (63.3)
Atrophy	
Yes	17 (56.7)
No	13 (43.3)
Biliary tree	
Yes	3 (10.0)
No	27 (90.0)
Free fluid	
Yes	2 (6.7)
No	28 (93.3)

idiopathic CP. A Spanish study from 2014 found an association between tobacco usage and pancreatic exocrine insufficiency in CP [9]. Diabetes mellitus is also more prevalent in these patients.

Pain is the most common reason for clinical admission and is the hallmark symptom of CP, usually epigastric radiation to the back or the left upper abdomen. In our cohort, 68% of the patients suffered from pain; in other studies, this varies between 80% and 96% [10,11]. Exocrine insufficiency characterized by steatorrhea and loss of weight occurs in end-stage pancreatitis in approximately 30% of cases. In the study, 35% of the patients reported significant weight loss, and diarrhea was reported in 12.66% of the cases. However, a disconcertingly small proportion of patients were subjected to a functional test (5.2%). Endocrine insufficiency was found in 33% of the cohort, while another study found it in 50–75% (Table 3).

Based on US findings shows increased echogenicity in 60%, 66.7% showed dilated and Irregular MPD, 36.7% show Focal calcification, 56.7% show Atrophy, 10% show Biliary tree and 6.7% show free fluid [12-14]. In CP calcification and visualization of the pancreas were found in 100% of cases, followed by pancreatic enlargement in 50% of cases and pseudocyst in 20% of cases. These findings are almost similar to those by Ferrucci *et al.* who had pancreatic calcification in 66% and pseudocyst in 25% of cases [15]. Hence, ultrasonography was helpful in the diagnosis of CP in 100% of cases.

CECT abdomen shows 100% HPD, 60% show dilated and irregular MPD, parenchymal calcification in 33.3%, focal MPD calcification in 13.3%, atrophy in 53.3% and pseudocyst in 6.7%. These were similar to the study reported by Hill *et al.* who found pancreatic calcification in 70% of cases but was contrary to that reported by Ferrucci *et al.* who found calcification in 36% of cases, pancreatic enlargement in 36% of cases and pseudocyst in 15% of cases [15,16]. Bhimwal *et al.* [1] study reported that computed tomography scan was equally important in the diagnosis of both acute and CP (100%). These observations were similar than that by Silverstein *et al.* (98%) and but significantly higher than Ferrucci *et al.* (56%) (Table 4) [15].

MRCP findings shows HPD in100%, 60% had Dilated and Irregular MPD, 40% had Parenchymal calcification, 16.7% had Focal MPD calcification and 60% had Atrophy (Table 5).

Transabdominal US is a low-cost, easy-to-use, non-invasive, and quick diagnostic tool. It can detect pancreatic calcifications, pseudocysts, and CP complications such as CBD obstruction and splenic or mesenteric vein obstruction. Unfortunately, bowel gas and body composition can complicate the process, and there is no link between pancreatic exocrine function and the number of calcifications. The sensitivity of transabdominal US is between 60% and 81%, while specificity is between 70 and 97%. As a result, it is no longer used as a diagnostic tool.

Despite inadequate functional testing for CP, enzyme substitution was used in 57% of patients based on clinical symptoms and radiomorphological changes. Steatorrhea occurs only when lipase secretion was 10% or higher. It was important to distinguish between pancreatic exocrine insufficiency and CP, as up to 20% of CP cases with exocrine insufficiency presented with no history of pain [17].

50% had undergone conservative management and 50% underwent Surgical management. Out of 10 patients on Surgical management, 60% underwent lateral pancreatojejunostomy, 20% underwent

Table 4: CECT abdomen

Variables	Frequency (%)
HPD	
Yes	30 (100.0)
No	0
Dilated and irregular MPD	
Yes	18 (60.0)
No	12 (40.0)
Size of pancreas	
E	3 (10.0)
N	22 (73.3)
S	5 (16.7)
Parenchymal calcification	
Yes	10 (33.3)
No	20 (66.7)
Focal MPD calcification	
Yes	4 (13.3)
No	26 (86.7)
CT atrophy	
Yes	16 (53.3)
No	14 (46.7)
Pseudocyst	
Yes	2 (6.7)
No	28 (93.3)

CT: Computed tomography, HPD: Hepatopancreatoduodenectomy, MPD: Main pancreatic duct, CECT: Contrast enhanced CT Scan

Table 5: MRCP findings

Variables	Frequency (%)
HPD	
Yes	30 (100.0)
No	0
Dilated and irregular MPD	
Yes	18 (60.0)
No	12 (40.0)
Parenchymal calcification	
Yes	12 (40.0)
No	18 (60.0)
Focal MPD calcification	
Yes	5 (16.7)
No	25 (83.3)
Atrophy	
Yes	18 (60.0)
No	12 (40.0)

MPD: Main pancreatic duct, HPD: Hepatopancreatoduodenectomy, MRCP: magnetic resonance cholangiopancreatography,

Table 6: Procedure

Variables	Frequency (%)
Lateral pancreatojejunostomy	6 (60.0)
Local resection of head-lateral pancreatojejunostomy	2 (20.0)
Local resection of head-lateral pancreatojejunostomy+CBD exploration	1 (10.0)
Local resection of head-lateral pancreatojejunostomy+cystogastrostomy	1 (10.0)
Total	10 (100.0)

CBD: Common bile duct

Table 7: Comparison of management

Variables	Frequency (%)	
	Conservative	Surgical
Duration		
<5	2 (13.3)	0
6–10	13 (53.3)	0
>10	5 (33.3)	0
Pain relief		
Yes	15 (100.0)	8 (80.0)
No	5 (0.0)	2 (20.0)
Steatorrhea		
Yes	15 (33.3)	8 (80)
No	5 (66.7)	2 (20)

local resection of head - lateral pancreatojejunostomy, 10% had local resection of head - lateral pancreatojejunostomy+CBD exploration and 10% had Local resection of head - lateral pancreatojejunostomy+cystogastrostomy. The primary indication for surgery was pain, the hallmark symptom of CP. Two randomized controlled trials found that surgical intervention involving a pancreatojejunostomy provided significantly better pain management than endoscopic treatment (Table 6) [18].

Aside from pain relief, the goals of surgical intervention is to preserve as much functional pancreas tissue as possible by correcting anatomical changes such as CBS and DS. Pain in CP can be caused by two factors: Parenchymal compression caused by an obstructed pancreatic duct system, and the alteration ofintrapancreatic nerve fibers and the activation state of intrapancreatic glia caused by chronically inflamed pancreatic tissue, particularly in the pancreatic head. The head is thought to be the pain's pacemaker, causing neuropathic pain and visceral neuropathy (Table 7) [19].

Endoscopic pseudocyst drainage is recommended unless the anatomical situation or cyst content precludes such an intervention. The goal of surgical drainage procedures is to drain and decompress pancreatic tissue that has become obstructed by the pancreatic duct system. Duvall described the first method in 1953: Pancreatic tail resection and splenectomy with retrograde drainage of the main duct into a non-functioning jejunal loop. The Puestow-Gilles by modification to the Duvall procedure in 1958 added a longitudinal opening of the pancreatic duct to achieve wider drainage of the pancreatic duct system.

The Partington-Rochelle procedure involves a side-to-side lateral pancreaticojejunostomy without resection of the pancreatic tail or spleen, thus sparing pancreatic tissue and preventing endocrine and exocrine pancreatic insufficiency. With a mean follow-up of 3.5–9.1 years, the procedure relieves chronic abdominal pain in 66–91% of cases; unfortunately, 30% of patients experience no pain relief due to the chronically inflamed pancreatic head [10].

In our study Surgical management shows 80% had pain relief and 53.3% had Steatorrhea. CDS and DS are caused by an inflamed, enlarged pancreatic head mass. Until Beger described the duodenum-preserving pancreatic head resection in 1972, pancreaticoduodenectomy (PD) was the only option (DPPHR). The stomach, duodenum, and extrahepatic bile ducts are not affected by this procedure. The CBD can be opened and sutured to the bottom of the resected cavity after the intrapancreatic CBD is decompressed and the inflamed pancreatic head is resected.

In a meta-analysis (2015), the Frey and Beger procedures were compared, and pain relief was achieved in 89% of cases using the Frey procedure in Parkinson's disease, with a shorter operation time and lower overall morbidity [11]. 18% of patients who had undergone DPPHR developed a stricture in the reinsertion site, while it was only 4% in PD [20].

CONCLUSION

CP is a relentlessly progressive fibroinflammatory process, resulting in destruction of endocrine and exocrine elements, which may eventually lead to pancreatic insufficiency. Advances have been made in etiopathogenesis and the role of genetic predisposition in this disease.

The natural history of CP is variable, making treatment decisions difficult and it is associated with intractable pain, pseudocyst formation, obstructive jaundice, intestinal obstruction, and hemorrhage. All patients who have smoldering CP ultimately suffer from progressive exocrine insufficiency and diabetes.

Conservative treatment in the form of analgesics, opioids, pancreatic enzymes, antidiabetics are given to ameliorate the symptoms. Some studies show that the early surgical intervention in the management of CP patients may lead to increase in morbidity and mortality.

In the present study, conservative management shows 100% pain relief, 33.3% had steatorrhea, while surgical management shows 80% had pain relief and 80% had steatorrhea. Our study concludes that patients with CP can be treated effectively with conservative management.

REFERENCES

1. Bhimwal RK, Makwana M, Panwar RR, Lal K. A prospective study of clinical, biochemical and radiological features in pancreatitis. Int J Adv Med 2017;4:1386-93.
2. Balaji LN, Tandon RS, Tandon BN, Banks PA. Prevalence and clinical feature of chronic pancreatitis in southern India. Int Pancreatol 1994;15:29-34.
3. McEntee GP, Gillen P, Peel AL. Alcohol induced pancreatitis Social and Surgical aspects. Br J Surg 1987;74:402-4.
4. Gillespie WJ. Observations on acute pancreatitis. A retrospective clinical study, Br J Surg 1973;60:63-5.
5. Panda CR, Misra B, Behera SK, Das HS, Singh SP. A study on changing clinical profile of chronic pancreatitis from a tertiary care centre. Int J Sci Stud 2017;5:170-3.
6. Yadav D, Whitcomb DC. The role of alcohol and smoking in pancreatitis. Nat Rev Gastroenterol Hepatol 2010;7:131-45. doi: 10.1038/nrgastro.2010.6, PMID 20125091
7. Frulloni L, Gabbrielli A, Pezzilli R, Zerbi A, Cavestro GM, Marotta F, *et al.* Chronic pancreatitis: Report from a multicenter Italian survey (PanCroInfAISP) on 893 patients. Dig Liver Dis 2009;41:311-7. doi: 10.1016/j.dld.2008.07.316
8. Díte P, Starý K, Novotný I, Precechtelová M, Dolina J, Lata J, *et al.* Incidence of chronic pancreatitis in the Czech Republic. Eur J Gastroenterol Hepatol 2001;13:749-50. doi: 10.1097/00042737-200106000-00024, PMID 11434607
9. Luaces-Regueira M, Iglesias-García J, Lindkvist B, Castiñeira-Alvariño M, Nieto-García L, Lariño-Noia J, *et al.* Smoking as a risk factor for complications in chronic pancreatitis. Pancreas 2014;43:275-80.
10. Isaji S. Has the Partington procedure for chronic pancreatitis become a thing of the past? A review of the evidence. J Hepatobiliary Pancreat Sci 2010;17:763-9. doi: 10.1007/s00534-009-0181-8, PMID 19779664
11. Zhou Y, Shi B, Wu L, Wu X, Li Y. Frey procedure for chronic pancreatitis: Evidence-based assessment of short- and long-term results in comparison to pancreatoduodenectomy and Beger procedure: A meta-analysis. Pancreatology 2015;15:372-9. doi: 10.1016/j.pan.2015.05.466, PMID 26055537
12. Mitchell RM, Byrne MF, Baillie J. Pancreatitis. Lancet 2003;361:1447-55. doi: 10.1016/s0140-6736(03)13139-x, PMID 12727412
13. Tamura R, Ishibashi T, Takahashi S. Chronic pancreatitis: MRCP versus ERCP for quantitative caliber measurement and qualitative evaluation. Radiology 2006;238:920-8. doi: 10.1148/radiol.2382041527, PMID 16424235
14. Hoffmeister A, Mayerle J, Beglinger C, Büchler MW, Bufler P, Dathe K, *et al.* S3-Consensus guidelines on definition, etiology, diagnosis and medical, endoscopic and surgical management of chronic pancreatitis German Society of Digestive and Metabolic Diseases (DGVS). Z Gastroenterol 2012;50:1176-224.
15. Ferrucci JT, Wittenberg J, Black EB, Kirkpatrick RH, Hall DA. Computed body tomography in chronic pancreatitis. Radiology 1979;130:175-82. doi: 10.1148/130.1.175, PMID 758645
16. Hill MC, Barkin J, Isikoff MB, Silverstein W, Kalser M. Acute pancreatitis: Clinical vs. CT findings. AJR Am J Roentgenol 1982;139:263-9.
17. DiMagno MJ, DiMagno EP. Chronic pancreatitis. Curr Opin Gastroenterol 2010;26:490-8. doi: 10.1097/MOG.0b013e32833d11b2, PMID 20693896
18. Vijungco JD, Prinz RA. Management of biliary and duodenal complications of chronic pancreatitis. World J Surg 2003;27:1258-70. doi: 10.1007/s00268-003-7246-7, PMID 14534824
19. Ceyhan GO, Demir IE, Rauch U, Bergmann F, Müller MW, Büchler MW, *et al.* Pancreatic neuropathy results in neural remodeling and altered pancreatic innervation in chronic pancreatitis and pancreatic cancer. Am J Gastroenterol 2009;104:2555-65.
20. Cataldegirmen G, Bogoevski D, Mann O, Kaifi JT, Izbicki JR, Yekebas EF. Late morbidity after duodenum-preserving pancreatic head resection with bile duct reinsertion into the resection cavity. J Br Surg 2008;95:447-52. doi: 10.1002/bjs.6006