Original Article

Comprehensive Management of Pain in Chronic Pancreatitis

Dr. Anoop burra[1], Dr. Dakshayani S Nirhale[2], Dr. Vijetha bandla[3], Dr. Abhinav Arigela[4], Dr.Vajja Ramya[5]

[1]Resident, dept of general surgery, Dr.D.Y.Patil medical college and hospital

[2]Department of General surgery, Dr. D.Y. Patil medical college and hospital

[3]Resident, Dr. D.Y.Patil medical college and hospital

[4]Resident, Department of surgery, Dr. D.Y. Patil Medical college and hospital

[5]Resident, Dr.D.Y.Patil Medical College and Hospital

DOI: 10.47750/pnr.2022.13.S10.107

Abstract

Background and objective: Chronic pancreatitis is a chronic, fibro-inflammatory condition that damages the pancreas' structural integrity permanently and impairs exocrine and endocrine function. Alcohol is a major part in the multifactorial pathogenesis. Pain in the form of recurrent attacks of pancreatitis or constant and disabling pain is usually the main symptom. Pain management is mainly empirical and involves treatment with potential potent analgesics, and duct drainage by endoscopic or surgical means.

Methods: An observational study was conducted at Dr. D.Y. Patil Medical College for a period of two years, from 2020 to 2022. Cases of chronic pancreatitis were chosen for the study after taking informed consent of the patients concerned. This study aims at achieving comprehensive pain management, and seeks to assess the response to different modalities of treatment. Accordingly, a total of 36 patients were studied by commencing a medical line of management, and their responses were documented using the visual analog scale (VAS) on Day 1, Day 3, and Day 5. Pain medications were stepped up in unresponsive cases based on the World Health Organization (WHO) pain relief ladder. Celiac plexus block and surgical intervention (lateral pancreaticojejunostomy) were conducted where the pain could not be subsided by using the medical line of management.

Results: Out of 36 cases with chronic pancreatitis, a majority of the cases had moderate pain (VAS score 4-7) at the time of admission, whereas severe pain (VAS > 7) was reported in 11.1% of the cases. Medical management was commenced in all cases by administering a paracetamol injection (1g IV, 8 hourly); however, pain was relieved in only 25% of the cases. In the remainder of cases, the line of treatment had to be stepped up by using a tramadol injection (1 ampule in 100ml NS IV, 8 hourly) in 61.1% (22 out of 27) of the cases, and by using a morphine injection (30mg IV, 8 hourly) in 13.9% (five) of the cases. Furthermore, celiac plexus block was required for managing pain in a total of 9 cases, and recurrence of pain after celiac plexus block was observed in 55% (5 out of 9 cases); these cases underwent lateral pancreaticojejunostomy. Cases that underwent surgical intervention showed satisfactory results with no recurrence of pain in the follow-up period.

Conclusion: A majority of the patients responded to various levels of medical analgesia. Only a few required surgical intervention for pain management. Hence, a multidisciplinary approach is required for adequate management of pain to improve the quality of life.

INTRODUCTION

Chronic pancreatitis is a chronic, fibro-inflammatory condition that damages the pancreas' structural integrity permanently, and impairs exocrine and endocrine function [1]. Undiagnosed, chronic pancreatitis can be the cause for persistent abdominal pain in many patients. The prevalence of chronic pancreatitis is 0.4-5% [2]. Alcohol abuse is the primary etiologic factor in the western world. Ductal blockage (from tumors and strictures), autoimmune, hypercalcemia, hyperlipidemia, toxins, and genetic factors are infrequent, but significant etiological factors which must be taken into account. In a tiny number of cases, the cause of pancreatitis cannot be determined, and this condition is termed as idiopathic pancreatitis. Given the variety of etiologic causes, it is not surprising that there are uncertainties in the diagnosis, and ultimately, the management of chronic pancreatitis.

Pain, either continuous or episodic, is the dominant and distressing feature of chronic pancreatitis which, in turn, significantly worsens the quality of life [3]. Typically, pancreatic pain manifests as dull, profoundly penetrating, epigastric discomfort that radiates to the back, and is frequently made worse by eating. The characteristics, location, and quality of pain can vary greatly, and a traditional pattern of pain may not be present always. Increased intrapancreatic pressure, either in the pancreatic duct or in the pancreatic parenchyma, which results in ischemia and pancreatic tissue inflammation, has been considered as a

pathophysiological reason for pain in cases of chronic pancreatitis on numerous occasions [4-5]. Given the variety of etiologic causes, it is not surprising that there are uncertainties in the diagnosis, and ultimately, the management of chronic pancreatitis.

Thus, in present study, we aimed to assess the severity of pain in cases of chronic pancreatitis, and to observe patients' responses to different modalities of treatment.

Materials & Methods

An observational study was conducted at our tertiary centre after procuring the approval from the Ethical Committee of Dr. D.Y. Patil Medical College (approval number IESC/162/2021). All the diagnosed cases of chronic pancreatitis during a span of two years, from 2020-2022, were included in the study. The study aimed at achieving comprehensive pain management in cases of chronic pancreatitis, and sought to assess patients' responses to different modalities of treatment.

Patients were strictly advised to stop consuming alcohol, and to quit smoking cigarettes. Medical line of management was commenced by administering a paracetamol injection (1g IV TID) and the response to the same was documented using the VAS score on Day 1, Day 3, and Day 5. Pain medications were stepped up in unresponsive cases based on the WHO pain relief ladder. Patients who did not respond to medical intervention were evaluated for obstructive causes (common bile duct stenosis, pancreatic duct calculi, strictures, and pseudocysts). Celiac plexus block and surgical intervention (lateral pancreaticojejunostomy) were conducted where pain could not be subsided by using the medial line of management. Improvement in the VAS score postoperatively could not provide a proper assessment as it was unclear whether the cause of improvement was surgery or administration of analgesics. Therefore, patients' VAS score was assessed after 3 days postoperatively once the oedema subsides. If the surgery was uneventful, the patient was discharged and recalled for assessment after 15 days, one month, three months, and every three months thereafter.

Statistical Analysis

All the data was noted down in a pre-designed study proforma. Qualitative data was represented in the form of percentage. All the data were calculated, appropriate statistical tests were used and analyzed by SSPS.

Results

The mean age of the patients with chronic pancreatitis was 45.06 years; most of them were in their third or fourth decade of life (63.9%) (Table 1).

Table 1: Age distribution

Age Group (years)	No. of patients	%
<=30	1	2.8%
31-50	23	63.9%
51-70	12	33.3%
>70	0	0.0%
Total	36	100.0%

Mean age - 45.06 +/- 9.44 years

Out of a total of 36 cases of chronic pancreatitis, 80.6% were males while 19.4% were females.

History of alcohol consumption and smoking was given by 75% and 72.2%, respectively, in cases of chronic pancreatitis. (Table 2)

Table 2: Associated risk factors

Personal History	**N**	**%**
Smoking	26	72.2%
Alcohol	27	75.0%

In a majority of the cases, moderate pain (VAS 4-7) was recorded at the time of admission, whereas severe pain (VAS>7) was reported by 11.1% cases (Table 3).

Table 3: VAS score on admission

VAS score on admission	**No. of patients**	**%**
<=3	2	5.6%
4 to 7	30	83.3%
>7	4	11.1%
Total	36	100.0%

Medical management was commenced by administering a paracetamol injection (IV TDS in all cases), which relieved pain in only one-fourth (25%) of the cases. In the remaining cases, the stepping up approach of the WHO was used in terms of analgesics. Overall, 61.1% cases required a tramadol injection (one ampule in 100 ml NS IV, 8 hourly) (22 out of 27 cases), whereas 13.9% (5 cases) required a morphine injection (30mg IV, 8 hourly) (Table 4).

Table 4: Response to medical management

Medical Management	**N**	**%**
Inj. PCM	36	100.0%
Improved	9	25.0%
Not Improved	27	75.0%
Stepped up to Tramadol	22	61.1%
Stepped up Morphine	5	13.9%

Table 5: Medical management in alcoholics

			ALCOHOLIC		**Total**
			No	Yes	
MANAGEMENT	inj. Paracetamol 1g IV	n	2	9	11
		%	22.2%	31.0%	28.9%
	inj. Paracetamol 1g IV + Morphine	n	1	4	5

		%	11.1%	13.8%	13.2%
	inj. Paracetamol 1g IV + Tramadol	n	6	16	22
		%	66.7%	55.2%	57.9%
Total		n	9	29	38
		%	100.0%	100.0%	100.0%

Chi-square: 0.37, P Value: 0.82, statistically not significant

Table 6: Medical management in smokers

			SMOKER		Total
			No	Yes	
MANAGEMENT	inj. Paracetamol 1g IV	n	1	10	11
		%	10.0%	35.7%	28.9%
	inj. Paracetamol 1g IV + Morphine	n	2	3	5
		%	20.0%	10.7%	13.2%
	inj. Paracetamol 1g IV + Tramadol	n	7	15	22
		%	70.0%	53.6%	57.9%
Total		n	10	28	38
		%	100.0%	100.0%	100.0%

Chi-square: 2.50, P Value: 0.28, statistically not significant

Celiac plexus block with a Bupivacaine injection (0.25%) was given in 9 cases (25%) for pain relief. Recurrence of pain after celiac plexus block was observed in 5 out of 9 cases (55.5%). These cases required surgical intervention, i.e., pancreaticojejunostomy. Overall, 5 out of 36 cases (13.8%) required surgical intervention for pain relief for conditions, such as common bile duct stenosis, pancreatic duct calculi, strictures, and pseudocysts. Cases that underwent surgical intervention showed satisfactory results with no recurrence of pain in the follow-up period (Table 7).

Table 7: Average VAS score after each intervention

INTERVENTION	AVG. VAS SCORE
On Admission	5.7
After medical management	4.1
After celiac plexus block	0.8
After surgical management	0

Table 8: Requirement of surgery

			REQUIREMENT OF SURGERY			Total
			LIF	No	Yes	
MANAGEMENT	inj. Paracetamol 1g IV	n	2	9	0	11
		%	100.0%	29.0%	0.0%	28.9%
	inj. Paracetamol 1g IV + Morphine	n	0	3	2	5
		%	0.0%	9.7%	40.0%	13.2%
	inj. Paracetamol 1g IV + Tramadol	n	0	19	3	22
		%	0.0%	61.3%	60.0%	57.9%
Total		n	2	31	5	38
		%	100.0%	100.0%	100.0%	100.0%

Chi-square: 9.44, P Value: 0.05, statistically significant

Discussion

Chronic pancreatitis is a long-lasting, pancreatic inflammatory disorder brought on by several endogenous or exogenous factors. It results in scar tissue formation, gradual damage to the pancreatic parenchyma, and loss of acinar and islet components.

A. Age

The mean age of patients with chronic pancreatitis in this study was 45.06 years; most of them were in their third or fourth decade of life (63.9%).

In a similar study conducted by Shakeel et al., the average age of the study participants was 37.4 years, with the majority of patients falling into the 20-39 year age range (51%) and the 40 59 year age range (36%) [6].

B. Associated Risk Factors

Alcohol: In this study, a history of alcohol consumption was presented in 75% of chronic pancreatitis cases. In Negi et al., the major etiological groups for cases of pancreatitis were alcohol (59.3%), and gallstones (35.6%) [7]. Panda et al. observed alcohol as the most common etiology (54.84%), followed by idiopathic cases (48.39%) p <0.002 [8]. Additionally, the study conducted by Sugumar K et al. also observed 55% of cases as cases of alcoholics [9].

Smoking: In this study, history of smoking was presented in 72.2% of chronic pancreatitis cases. For chronic pancreatitis, cigarette smoking is an independent risk factor. A recent meta analysis found that comparing current smokers to non-smokers, the pooled risk estimate for chronic pancreatitis was 2.5 (95% CI: 1.3-46) [10]. Furthermore, Andriulli et al. found a significant relationship between smoking and chronic pancreatitis. Current smokers were found to be 2.8 times more likely to suffer from pancreatitis than never smokers (95% CI, 1.8 -5.2) [11].

C. Medical Line of Management

In a majority of cases, moderate to severe pain (VAS 4-7) was observed at the time of admission, whereas very severe pain (VAS>7) was reported by 11.1% cases. In the present study, medical management was commenced by administration of a paracetamol injection (1g IV, 8 hourly) in all cases, which relieved pain in only one-fourth (25%) of cases. In the remaining

cases, the stepping up approach prescribed by the WHO was used in terms of analgesics. Overall, 61.1% of cases required injection tramadol (22 out of 27 cases), while 13.9% (5 cases) required a morphine injection. On the whole, medical management was successful in a majority of the cases (75%). Sugumar K et al., in a tertiary hospital in India, assessed the effectiveness of chronic pancreatitis treatment in terms of pain intensity. The authors therein observed that in 68% of the cases, medical therapy was successful, with most of the cases requiring opioids [9].

D. Celiac Plexus Block

If sufficient pain relief could not be achieved by medical therapy, celiac plexus block with a Bupivacaine injection (0.25%) was administered in 9 cases (25%) for pain relief. Satisfactory pain relief with no recurrence was seen in 4 cases during the follow-up period. Gress et al. concluded that 50 out of 90 patients achieved pain relief with a confidence interval (CI) of 95% as 0/4689-1 [12]. Moreover, Levy et al. observed that 5 out of 13 patients experienced pain relief with 95% CI as 0.2217-1 [13].

E. Surgical Management

In this study, recurrence of pain after celiac plexus block was observed in 5 out of 9 cases (55.5%). These cases required surgical intervention, i.e., lateral pancreaticojejunostomy. Overall, 5 out of 36 cases (13.8%) required surgical intervention for pain relief for conditions, such as bile duct stenosis, pancreatic duct calculi, strictures, and pseudocysts. After 15 days of surgery, pain score was lower than five in all cases, whereas by the end of one month, all cases experienced no sensation of pain.

In the study conducted by Sugumar K et al., celiac plexus block was required in 11% cases, whereas over 21% cases required surgical intervention [9]. Most of the cases had ductal disease. All the cases showed significant improvement in terms of pain post surgery. According to the authors, intra ductal pressure can be relieved and pain reduced by drainage procedures, like lateral pancreatojejunostomy, or decompression surgeries, such as distal pancreatectomy.

Hughes DL et al., in their meta-analysis, demonstrated that operative treatment was associated with a significantly higher rate of complete pain control (37%) when compared to endoscopic therapy or celiac plexus block (17%) [OR (95% CI) 2.79 (1.53-5.08), p = 0.0008]. According to the study's findings, surgical treatment of chronic pancreatitis causes complete pain alleviation during long-term follow-up [14].

Furthermore, Ke N et al. compared the timing of the surgery with the aspect of pain control. Therein, data indicated that early surgery resulted in higher rates of pain relief (complete 69% vs. 47%, partial 22% vs. 37%, none 8% vs. 16%, P = .01) [15].

This study was limited due to its small sample size because of which definitive management for chronic pancreatitis could not be standardized. Furthermore, association of comorbidities and chronic pancreatitis was beyond the scope of the study.

Conclusion

The present study demonstrated that a majority of patients responded to various levels of medical analgesia. However, in cases of recurring pain, the need for a celiac plexus block and a surgical management could not be disregarded. Thus, it can be concluded that the treatment of chronic pancreatitis requires a multi-disciplinary approach for adequate pain management in order to improve patients' quality of life.

REFERENCES

1. Steer ML, Waxman I, Freedman S. Chronic pancreatitis. N Engl J Med 1995;332:1482-90.
2. Feldman M, Friedman L, Brandt L. Sleisenger and Fordtran's Gastrointestinal and Liver Disease: Pathophysiology, Diagnosis, Management. 8th ed. Saunders: Philadelphia; 2006. pp. 1271–1300.
3. Gachago C, Draganov PV. Pain management in chronic pancreatitis. World J Gastroenterol. 2008 May 28;14(20):3137-48.
4. Di Sebastiano P, di Mola FF, Büchler MW, Friess H. (2004) Pathogenesis of pain in chronic pancreatitis. Dig Dis 22:267–272.
5. Ebbehoj N, Borly L, Bulow J, Rasmussen SG, Madsen P. (1990) Evaluation of pancreatic tissue fluid pressure and pain in chronic pancreatitis. A longitudinal study. Scand J Gastroenterol 25:462–466
6. Shakeel MD et al. Clinical profile of patients with pancreatitis. International Surgery Journal. 2017 Feb;4(2):534-537.

7. Negi N, Mokta J, Sharma B, Sharma R, Jhobta A, Bodh V, Ranjan A. Clinical Profile and Outcome of Chronic Pancreatitis: A Hospital-Based Prospective Observational Study in Subhimalayan State. Journal of The Association of Physicians of India. 2018 Mar;66:22.
8. Panda CR, Misra B, Behera SK, Das HS, Singh SP. A Study on Changing Clinical Profile of Chronic Pancreatitis from a Tertiary Care Centre. International Journal Of Scientific Study. 2017 Jul 1;5(4):170-3.
9. Sugumar K, Deshpande A. Outcomes of pain management in chronic pancreatitis: experience from a tertiary care hospital in India. Turkish journal of surgery. 2020 Dec;36(4):359.
10. Yadav D, Hawes RH, Brand RE, Anderson MA, Money ME, Banks PA, Bishop MD, Baillie J, Sherman S, DiSario J, Burton FR. Alcohol consumption, cigarette smoking, and the risk of recurrent acute and chronic pancreatitis. Archives of internal medicine. 2009 Jun 8;169(11):1035-45..
11. Andriulli A, Botteri E, Almasio PL, Vantini I, Uomo G, Maisonneuve P. Smoking as a cofactor for causation of chronic pancreatitis: a meta-analysis. Pancreas. 2010 Nov 1;39(8):1205-10.
12. Gress F, Schmitt C, Sherman S, Ciaccia D, Ikenberry S, Lehman G. Endoscopic ultrasound-guided celiac plexus block for managing abdominal pain associated with chronic pancreatitis: a prospective single center experience. The American journal of gastroenterology. 2001 Feb 1;96(2):409-16..
13. Levy MJ, Topazian MD, Wiersema MJ, Clain JE, Rajan E, Wang KK, Jose G, Gleeson FC, Pearson RK, Pelaez MC, Petersen BT. Initial evaluation of the efficacy and safety of endoscopic ultrasound-guided direct Ganglia neurolysis and block. Official journal of the American College of Gastroenterology| ACG. 2008 Jan 1;103(1):98-103.
14. Hughes, D.L., Hughes, I. & Silva, M.A. A meta-analysis of the long-term outcomes following surgery or endoscopic therapy for chronic pancreatitis. Langenbecks Arch Surg. 2022; 407: 2233–2245.
15. Ke N, Jia D, Huang W, Nunes QM, Windsor JA, Liu X, Sutton R. Earlier surgery improves outcomes from painful chronic pancreatitis. Medicine. 2018 May;97(19).