Original Article

Assesment of pain management in chronic pancreatitis after lateral pancreatico-jejunostomy: A comparative analysis of pre and post operative outcomes

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ABSTRACT:

Background: *Chronic pancreatitis is a fairly common condition with pain being the major symptom and lateral pancreaticojejunostomy (LPJ) is performed for symptomatic relief. It is done for patients with severe pain, obstructed and dilated pancreatic duct. Surgical decompression of the duct and ductal drainage can achieve best pain relieve and slow the progression of the disease.*

Aim: *The aim of the study was to assess relief of pain pre and post-LPJ for chronic pancreatitis.*

Methods: *This prospective observational study was conducted at the Department of Surgery in Shaheed Suhrawardy Medical College Hospital, for One year period. Patients with chronic pancreatitis admitted in the department of surgery were approached for inclusion in the study. Total 17 patients were selected according to inclusion and exclusion criteria. Informed written consent was taken from each patient. All patients underwent lateral Pancreaticojejunostomy. Detail clinical and demographic history was taken along with thorough physical examination relevant investigations. All patients were evaluated preoperatively and post operatively at discharge, 1 month and 3 months. Pain was assessed preoperatively and post operatively using Visual analogue scale (VAS). Collected data were checked and analysed in SPSS 23.*

Results: *Among 17 patients, average age was 33.4 (±9.6) years with majority in age group 20-35 years. Male patients were more than female (67% vs 33%). Major clinical presentations upper abdominal pain (100%), nausea/vomiting (73.3%), history of weight loss (60%), fatigue (53.3%), fever (40%), steatorrhoea (40%), diarrhoea (33.3%) and shortness of breathe (26.7%). Among 73.3% patients, outcome was good and among 26.7% patients, outcome was poor. Of all, 40% had VAS score 0 at discharge but increased at 1 months (53.3%) and 3 months (73.3%) follow up and 26.7% had higher VAS score at discharged reached but to a VAS score of 0 or 2 at 1 month (6.7%) and 3 months (6.7%) follow up. Mean pain score before and after the lateral pancreaticojejunostomy surgery was 8.26±1.27 and 1.7±1.66 with statistically significance (p <0.001).*

Conclusion: *Seventy Three percent of patients had good outcome regarding pain after LPJ. Significant relief in symptoms of pain were noted after LPJ. Further larger study is recommended to validate this findings.*

Key Words:
Chronic pancreatitis,LPJ,
Visual analogue scale.

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INTRODUCTION

The pancreas is a composite gland with both exocrine and endocrine components. The exocrine component forms the bulk of the gland, with the serous acinar cells comprising 80 per cent of the gland volume. In contrast, the endocrine component within the islets of Langerhans comprises a mere 2 per cent of the gland structure. The remaining 18 per cent is comprised of ducts, nerves, vessels and connective tissue. Chronic pancreatitis is defined as a continuing inflammatory disorder of the pancreas characterized by irreversible pathological changes which cause abdominal pain and/or permanent impairment of pancreatic exocrine and endocrine function. Its clinical course is characterized by severe pain and, in the later stages, exocrine and endocrine pancreatic insufficiency.[2] Chronic pancreatitis is a fairly common condition with pain being the major symptom, and lateral pancreaticojejunostomy (LPJ) is performed for symptomatic relief. The aim of the study was to assess relief of pain pre and post-LPJ for chronic pancreatitis.

In chronic pancreatitis, there is a significant relief in symptoms of pain post-LPJ. There is reduction in analgesic requirement and frequency of acute attacks of pain. Fifty-seven percent of patients had a complete remission of their pain after LPJ for CP.[3]

The incidence of chronic pancreatitis in certain parts of the world, such as South East Asia, the prevalence is higher (100–200 per 100 000). High alcohol consumption is the most frequent cause of chronic pancreatitis, accounting for 60–70% of cases. Other causes include pancreatic duct obstruction resulting from stricture formation after trauma, after acute pancreatitis, or even occlusion of the duct by pancreatic cancer.[4]

Pain is the most frequent symptom in CP.[5] Pain arises in the epigastrium, usually radiating to the back. Radiation to the right or left hypochondrium is common. Patients describe the pain as severe, constant and unremitting. It is usually worse after food and associated with post-prandial nausea and vomiting.[6]

Two patterns of pain have been described. Type A pain is short relapsing episodes lasting days to weeks, with pain-free intervals. Type B pain is prolonged, severe, unrelenting pain.[7]

The exact mechanism of pain in most patients is still unknown. Many investigators believe that the mechanism of pain in chronic pancreatitis is due to: 1. increased intrapancreatic ductal pressure, 2. Pancreatic inflammation and 3. infiltration of the coeliac plexus nerves with proteinaceous or fibrotic material.[8]

Other symptoms include Loss of exocrine function leads to steatorrhoea and diarrhoea in more than 30% of patients with chronic pancreatitis. Loss of endocrine function leads to the development of diabetes mellitus. Nausea, vomiting and weight loss are very common.[4]

Diagnosis is usually made by clinical, biochemical and radiological examination, and the treatment is medical, surgical, endoscopic, or combined.

There are two indications for surgical treatment:

1. Intractable pain.

2.The development of complications– these include (1) lower bile duct obstruction; (2) duodenal obstruction; (3) vascular involvement; (4) pancreatic pseudocysts; and (5) the presence of a dominant mass leading to the fear or suspicion of cancer.[2]

Operative procedures designed with the objective of eliminating pain and treating the complications of chronic pancreatitis have historically been classified into:

1. Decompression of diseased and obstructed pancreatic ducts, thereby relieving the pain and improving the exocrine and endocrine function.

2. Denervation of the pancreas or resection of the proximal, distal, or total pancreas.

In lateral pancreaticojejunostomy (LPJ), the pancreatic duct is opened longitudinally, and a loop of jejunum is sutured to the duct. Studies have reported pain relief varying from 63 to 93 % from 1973 to 1999 after lateral pancreaticojejunostomy.[3]

The majority of patients with chronic pancreatitis do not require surgical intervention and may be managed conservatively. Conservative management consists of elimination of the aetiological agent, and medical treatment of the complications, mainly pain and pancreatic exocrine and endocrine insufficiency. Where alcohol excess is the cause, abstinence from alcohol must be encouraged. Analgesics appropriate to the level of pain should be prescribed. Exocrine insufficiency is treated by the prescription of pancreatic enzyme supplements.

Endocrine insufficiency may require prescription of oral hypoglycaemic agents or insulin therapy.

In general, there are two forms of surgery 1. Drainage procedure and 2. Resective procedure. Puestow and Gillesby described the drainage procedure of dilated pancreatic duct in 1958 which included amputation of tail of pancreas and splenectomy with side to side pancreaticojejunostomy using a jejunal Roux loop. Today most surgeons perform the side to side pancreaticojejunostomy which was introduced by Partington and Rochelle. In the original Puestow operation the drainage of the distal duct was combined with a splenectomy and distal pancreatectomy, but the later modification by Partington and Rochelle preserves both the pancreatic tail and the spleen

pancreaticojejunostomy aims to provide drainage of the main pancreatic duct. The operation may be undertaken in patients with intractable pain and radiological evidence of pancreatic duct dilatation with or without pancreatic duct calculi.[9]

We used visual analogue scale to assess pain pre operatively and post operatively.

In this study we performed Lateral pancreaticojejunostomy for chronic pancreatitis. The aim of the study was to assess pain pre operatively and post lateral pancreaticojejunostomy state in our institute.

MATERIALS AND METHOD

This is a cross sectional study done at Shaheed Suhrawardy Medical College and Hospital over a period of one year (August 2021 to July 2022) amongst the admitted patient in Department of Surgery. A total of 15 subjects (n=15) were chosen for purposive sampling. Patients who were diagnosed as a case of malignancy per operatively or postoperatively,who developed complications after pancreatic surgery and the patients of chronic pancreatitis who did not follow up are excluded from this study. After inclusion and assessment, all patients were interviewed by the research team for base line data like age, sex, socioeconomic status, BMI and co-morbid disease. Subjects were investigated for anesthetic fitness as well as to identify comorbidities.All patients underwent lateral Pancreaticojejunostomy. Detail clinical and demographic history was taken along with thorough physical examination relevant investigations. All patients were evaluated preoperatively and post operatively at discharge, 1 month and 3 months.

Pain was assessed preoperatively and post operatively using Visual analogue scale (VAS). The Visual Analogue Scale (VAS) consists of a straight line with the endpoints defining extreme limits such as 'no pain at all' and 'pain as bad as it could be'. The patient was asked to mark his pain level on the line between the two endpoints. All information were recorded in separate case record form.

RESULTS

This prospective observational study was conducted in the Department of Surgery, Shaheed Suhrawardy Medical College Hospital Dhaka on 15 patients with diagnosed case of chronic pancreatitis. Majority respondents belonged to age group 20-35 years (60%) and followed in decreasing order by 36-50 years (20%), >50 years (13.3%) and <20 years (6.7%). Mean age was 33.4±9.6 (SD) years.

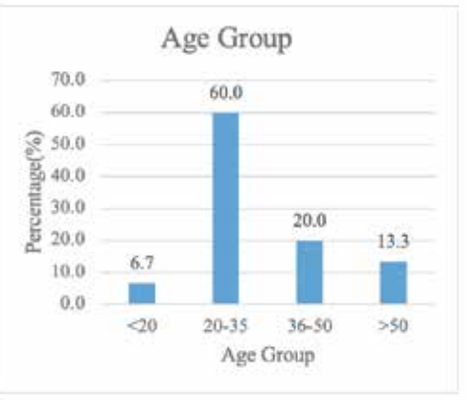

Figure I: Distribution of respondents by age (n=15)

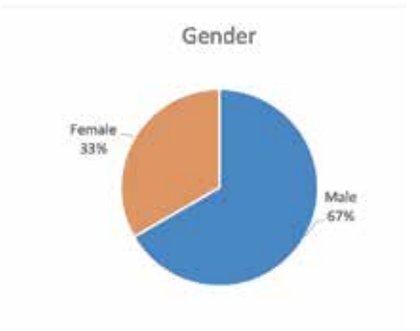

Figure II: Distribution of respondents by gender (n=15)

Majority respondents were male (67%) and were female (33%).

Majority respondents resided in rural area (60%) and 40% resided in urban area.

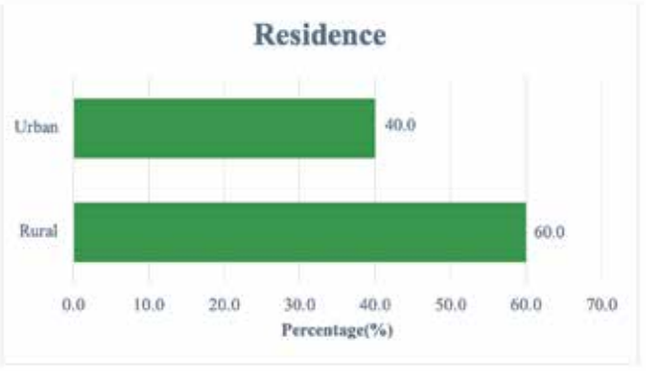

Figure III: Distribution of respondents by residence (n=15)

Majority respondents were middle class (53.3%) followed in decreasing order by poor (26.7%) and rich (20%).

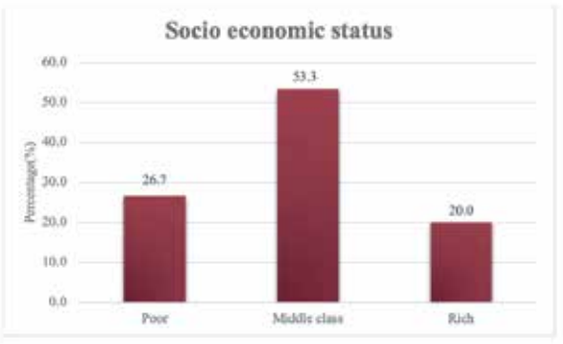

Figure IV: Distribution of respondents by socioeconomic status (n=15)

Majority respondents had history of smoking 53.3% and 46.7% were nonsmoker.

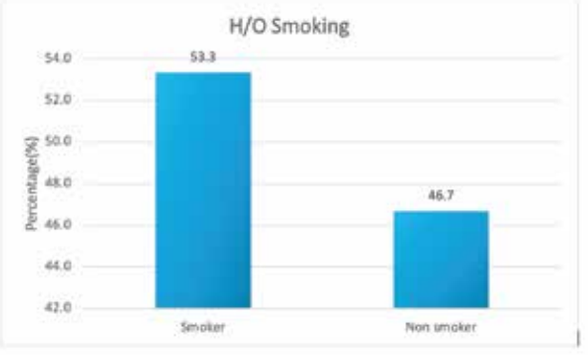

Figure V: Distribution of respondents by H/O smoking (n=15)

Majority respondents had no history of alcohol intake 53% and 47% were alcoholic.

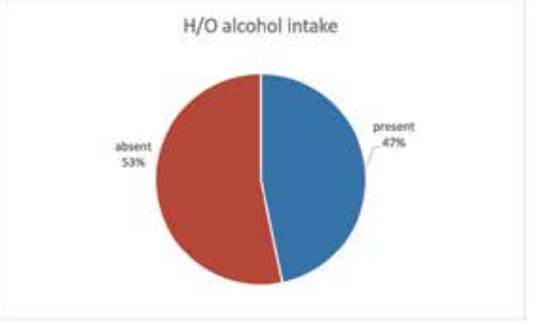

Figure VI: Distribution of respondents by H/O alcohol intake (n=15)

Among total population 73.3% had diabetes mellitus and 26.7% did not had diabetes mellitus.

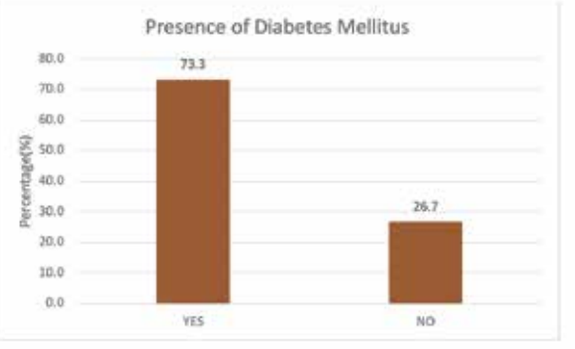

Figure VII: Distribution of respondents by presence of diabetes mellitus (n=15)

The table showing the presence of clinical features of chronic pancreatitis. Majority of the respondents had upper abdominal pain (100%) followed in decreasing order by nausea/vomiting (73.3%), history of weight loss (60%), fatigue (53.3%), fever (40%), steatorrhoea (40%), diarrhoea (33.3%) and shortness of breath (26.7%).

Table I: Distribution of the respondents by presence of clinical features of chronic pancreatitis (n=15)

Clinical Features	Frequency (n)	Percentage (%)
Upper abdominal pain	15	100
Nausea/Vomiting	11	73.3
History of weight loss	9	60
Fatigue	8	53.3
Fever	6	40
Steatorrhoea	6	40
Diarrhoea	5	33.3
Shortness of breath	4	26.7

The table showing the indication of lateral pancreaticojejunostomy (LPJ). Majority of the respondents had stone in the body or head (66.7%) followed in decreasing order by stone in the body, head and tail (20%), fibro calcification and stone in the head of the pancreas (6.7%) and MPD stone and obstructed CBD due to peri-ampullary stricture (6.7%).

Table II: Distribution of the respondents by indication of lateral pancreaticojejunostomy (LPJ) (n=15)

Indication of lateral pancreaticojejunostomy (LPJ)	Frequency (n)	Percentage (%)
Stone in the body or head	10	66.7
Stone in the body, head and tail	3	20
Fibro calcification and stone in the head of the pancreas	1	6.7
MPD stone and obstructed CBD due to peri-ampullary stricture	1	6.7
Total	15	100

The table showing the outcome of lateral pancreaticojejunostomy (LPJ). Majority of the respondents had good outcome 73.3% and 26.7% had poor outcome after the surgery.

Table III: Distribution of the respondents by Outcome of lateral pancreaticojejunostomy (LPJ) (n=15)

Outcome of lateral pancreaticojejunostomy (LPJ)	Frequency (n)	Percentage (%)
Good	11	73.3
Poor	4	26.7

Table IV shows according to VAS pain score 0 and 2 considered as improvement. Comparing VAS score of patients before and after lateral pancreaticojejunostomy surgery, pain improvement in postoperative period. Six subjects (40%) had VAS score of 0 at discharge but increased at 1 months (53.3%) and 3 months (73.3%) follow up. Four subjects (26.7%) who had higher VAS score at discharged reached to a VAS score of 0 or 2 at 1 month (6.7%) and 3 months (6.7%) follow up.

Table IV: Distribution of VAS pain score on Preoperative pain status and Postoperative pain status (n=15)

Pain score	Preoperative pain status (on admission)	Postoperative pain status (on discharge)	Postoperative pain status (on after 1 month follow-up)	Postoperative pain status (on after 3 month follow-up)
	n=15 n(%)	n=15 n(%)	n=15 n(%)	n=15 n(%)
0 (No pain)	0(0)	6(40)	8(53.3)	11(73.3)
2 (Mild pain)	0(0)	5(33.3)	6(40)	3(20)
4 (Moderate pain)	0(0)	4(26.7)	1(6.7)	1(6.7)
6 (Severe pain)	2(13.3)	0(0)	0(0)	0(0)
8 (Very severe pain)	9(60)	0(0)	0(0)	0(0)
10 (Worst pain possible)	4(26.7)	0(0)	0(0)	0(0)

Table V shows mean pain score before the lateral pancreaticojejunostomy surgery was 8.26±1.27 and after lateral pancreaticojejunostomy surgery was 1.7±1.66 (on discharge), 1.06±1.27 (on after 1 month follow-up), 0.66±1.23 (on after 3 month follow-up).

Table V: Distribution of the respondents by VAS (0-10) of preoperative pain status and postoperative pain status (n=15)

Pain score VAS (0-10)	Preoperative pain status(on admission)	Postoperative pain status (on discharge)	Postoperative pain status (on after 1 month follow-up)	Postoperative pain status (on after 3 month follow-up)
Mean±SD	8.26±1.27	1.7±1.66	1.06±1.27	0.66±1.23

Table VI shows mean pain score before the lateral pancreaticojejunostomy surgery was 8.26±1.27 and after lateral pancreaticojejunostomy surgery was 1.7±1.66. Among preoperative pain status and postoperative pain status the pain status improvement was significantly associated with the surgery (p <*0.001).

Table VI: Distribution of the respondents by comparing the pain score of preoperative pain status and postoperative pain status (n=15)

Pain score VAS (0-10)	Preoperative pain status(on admission)	Postoperative pain status (on discharge)	P value
Mean±SD	8.26±1.27	1.7±1.66	<*0.001

*P value was determined by paired sample t test.

DISCUSSION

Chronic pancreatitis is characterized by a varied and unpredictable clinical course culminating in profound endocrine and exocrine gland dysfunction. Persistent and intractable pain is the principal clinical feature in approximately 90% of patients and has perhaps the greatest detrimental impact on quality of life. Surgical intervention is indicated for complications of chronic pancreatitis (including pseudo- cyst formation, biliary obstruction and duodenal obstruction) and in carefully selected patients is beneficial in reducing pain.[40] Lateral Pancreaticojejunostomy (LPJ) has recognized applications in the management of Chronic Pancreatitis (CP). It is done for patients with severe pain, obstructed and dilated pancreatic duct. Ductal obstruction by stone or stricture causes rise of intraductal pressure and parenchymal ischemia. Surgical decompression of the duct and ductal drainage can achieve best pain relieve and slow the progression of the disease.[12] Pancreaticojejunostomy avoids sacrifice of functioning pancreatic tissue, and it allows the remaining pancreatic secretions to enter the intestine and contribute to digestion. This advantage of drainage is illustrated by the small number of our patients who require pancreatic enzyme replacement.[41]

This prospective observational study was conducted in the

Department of Surgery, Shaheed Suhrawardy Medical College Hospital Dhaka on 15 patients with diagnosed case of chronic pancreatitis.

In this study, majority respondents belonged to age group 20-35 years(60%) and followed in decreasing order by 36-50 years(20%), >50 years (13.3%) and <20 years (6.7%). Mean age was 33.4±9.6 (SD) years. According to Rabbi et al study which was done in Bangladesh they also found that 48.11% were in 3rd decade of life and mean age was 32.8±6.7 years which corresponds with our study result.[13]

According to the study result, majority respondents were male (67%) and were female (33%). In Durbec and Sarles study they found that most of the patient of chronic pancreatitis were male which corresponds with our findings also.[42] Moreover, The difference in sex ratio is best explained by the fact that in Bangladesh males are more likely than females to seek hospital care for their illness.

In our study most of the respondents resided in rural area (60%) and 40% resided in urban area. Moreover, majority respondents were middle class (53.3%) followed in decreasing order by poor (26.7%) and rich (20%). According to Sharma et al study they also found that most of the patients of chronic pancreatitis was belonged to rural area and they were middle class peoples with was similar with our study also.[43]

The study result showed that majority respondents had history of smoking 53.3% and 47% respondents had history of alcohol intake. According to Barman et al study, they also found most of the patients with chronic pancreatitis were alcoholic and smoker which corresponds with our study.[19]. In Singhvi and Yadav study which also showed that patients of chronic pancreatitis were alcoholic and smoker which similar with our findings also. Smoking is an independent risk factor or chronic pancreatitis and has synergistic pathogenic effects with alcohol. Effects of chronic alcohol consumption on the brainstem result in adaptive responses in the neurohormonal control of pancreatic secretion to maintain normal pancreatic enzyme output despite inhibitory effects of alcohol on neurohormonal reflexes.[44]

According to our study, among total population 73.3% had diabetes mellitus. In Barman et al study, they also found most of patients of chronic pancreatitis had diabetes mellitus. Diabetes is an inevitable consequence of chronic pancreatitis commonly occurring a decade or two after the first episode of abdominal pain. Diabetes in chronic pancreatitis is called fibrocalculous pancreatic diabetes (FCPD), which is now classified under the broad category of other specific types both in the American Diabetes Association and the WHO consultation classifications of diabetes.[19]

In our study, majority of the respondents had upper abdominal pain (100%) followed in decreasing order by nausea/vomiting (73.3%), history of weight loss (60%), fatigue (53.3%), fever (40%), steatorrhoea (40%), diarrhoea (33.3%) and shortness of breath (26.7%) as clinical features of chronic pancreatitis. In Balaji et al study they also found that the course of the illness, most patients experienced abdominal pain, malabsorption/malnutrition which corresponds with our result.[45] Datta et study which was done in Bangladesh they also found that The most common presentations of both moderate and severe pancreatitis were upper abdominal pain and vomiting.[46]

Our study showed that indication of lateral pancreaticojejunostomy (LPJ) in majority respondents were stone in the body or head (66.7%) followed in decreasing order by stone in the body, head and tail (20%), fibro calcification and stone in the head of the pancreas (6.7%) and MPD stone and obstructed CBD due to peri-ampullary stricture (6.7%). In Rezaul study which was also done in Bangladesh they also found the most common indication of lateral pancreaticojejunostomy (LPJ) in chronic pancreatitis was stone in the body and or head which corresponds with our study. Different surgical procedures can be chosen according to the location of the stones in the pancreatic duct. When the stones are mainly located in the head of pancreas and stone size is less than 5 mm, endoscopic drainage and removal of the stones is usually the first choice of treatment. Larger stones can be broken down by ESWL. If it fails, surgical procedure should be applied. If the stones are mainly located in the body of the pancreas, they can be treated with Puestow- Gillesby procedure or Lateral pancreato-jejunostomy (LPJ), which is often used in patients with significant dilation of the pancreatic duct.[13]

According to this study, 73.3% had good outcome and 26.7% had poor outcome after lateral pancreaticojejunostomy (LPJ). In Abhishek et al study also showed that LPJ had good outcome in most of patients with chronic pancreatitis. LPJ is the surgery of choice for chronic pancreatitis

patients with pain not releived by NSAIDs, dilated MPD (≥ 6mm), with or without MPD stones and no inflammatory mass in head region. Adequate MPD decompression is the key to successful surgery.10 Lateral pancreaticojejunostomy has also been combined with local resection of the head ofthe pancreas in some patients to achieve the presumed benefits of both resectional and decompressive procedures in removing the affected tissue in the head of the pancreas while draining the dilated duct.[16]. In Rezaul et al study which was done in Bangladesh they also found that the outcome lateral pancreaticojejunostomy was good which similar with our study. Successful removal of pancreatic duct stones and drainage of the pancreatic duct can reduce pain and improve pancreatic function in majority of patients. Lateral pancreatojejunostomy is the best way to achieve that drainage.[12] Myles et al study they showed the surgical outcome is depends on patient's pain relief status. A change of 10 for the 100mm pain VAS would be the minimal clinically important difference, and the VAS of moderate pain (33mm) or less signifies acceptable pain control after surgery which means improvement in surgical outcome.[47]

In our study, the result showed pain status according to VAS pain score 0 and 2 considered as improvement. Comparing VAS score of patients before and after lateral pancreaticojejunostomy surgery, pain improvement in postoperative period. Six subjects (40%) had VAS score of 0 at discharge but increased at 1 months (53.3%) and 3 months (73.3%) follow up. Four subjects (26.7%) who had higher VAS score at discharged reached to a VAS score of 0 or 2 at 1 month (6.7%) and 3 months (6.7%) follow up. Moreover, the mean pain score before the lateral pancreaticojejunostomy surgery was 8.26±1.27 and after lateral pancreaticojejunostomy surgery was 1.7±1.66 (on discharge), 1.06±1.27 (on after 1 month follow-up), 0.66±1.[23] (on after 3 month follow-up). Among preoperative pain status and postoperative pain status the pain status improvement was significantly associated with the surgery (p <*0.001).According to Seetharam et al study, the also found that the percentage reduction in pain was different in these subjects when assessed by VAS 57 % of the subjects had 100 % relief of their symptoms at the end of 6months. Moreover, they also found that Fifty-seven percent of patients had a complete remission of their pain after LPJ for chronic pancreatitis which correspondents with our result.48 In Abhishek et al study they also found that there was significant improvement between preoperative pain status and postoperative pain status. Immediately post-surgery follow up, complete pain relief was seen in 100% patients which correspondents with our study.[10] Patients who undergo surgery as their initial treatment for chronic pancreatitis require less consecutive interventions, a shorter hospital stay, and have a better quality of life compared with any other treatment.[12]

LIMITATIONS

There were a number of limitations of the study, which includes: (a) Sample size is not representative to generalized the findings (b) Study samples was collected in only one tertiary care center (c) Patients undergoing emergency operations were not included (d) Influence of socioeconomic status behind pancreatitis was not examined and (e) Long term follow ups were not assessed.

CONCLUSION

Seventy Three percent of patients had good outcome regarding pain after LPJ. Significant relief in symptoms of pain were noted after LPJ. Further larger study is recommended to validate this findings.

CONFLICTS OF INTEREST

Not reported

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