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# Assesment of Pain Management in Chronic Pancreatitis after Lateral Pancreatico Jejunostomy

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**Abstract** **Original Research Article**

***Background:*** The main symptom of chronic pancreatitis is pain, which is treated via lateral pancreaticojejunostomy (LPJ) to relieve symptoms. Patients with dilated pancreatic ducts and excruciating pain are treated with it. Slowing the disease's course and providing optimal pain relief can be accomplished through surgical decompression of the duct and ductal drainage. ***Objective:*** The aim of this study is to assessment of pain management in chronic pancreatitis after lateral pancreatico jejunostomy. ***Methods:*** The cross-sectional observational study was conducted in the department of Surgery, Avicenna hospital limited, Sirajganj, Bangladesh, from October 2022 to September 2023. A total of 90 patients who underwent lateral pancreatico jejunostomy for patients with chronic pancreatitis were included in the study. The questionnaire was pretested, corrected and finalized. Data were collected by face-to-face interview and analyzed by appropriate computer based programmed software Statistical Package for the Social Sciences (SPSS), version 24. ***Results:*** In this study, with a range from 20 to 70 years, maximum 36 (40.0%) of the patients were within the age group of 31 - 40 years and minimum 5 (5.6%) of the patients were in the age 61 - 70 years and most of the patients 56 (62.20%) were male and 34 (37.80%) patients were female. Most of the patients 46 (51.1%) came from middle-income families. The majority of respondents had history of smoking 53 (58.90%) and 37 (41.10%) were nonsmoker. The majority of respondents had no history of alcohol intake 66 (73.30%) and 24 (26.70%) were alcoholic. Among total population 58 (64.40%) had diabetes mellitus and 32 (35.6%) did not had diabetes mellitus. Majority of the respondents had upper abdominal pain (100%) followed in decreasing order by nausea/vomiting 68 (75.6%), history of weight loss 61 (67.80%), fatigue 47 (52.2%), fever 37(41.10%), steatorrhoea 35(38.90%), diarrhoea 29(32.20%) and shortness of breath 21(23.30%). Majority of the respondents had stone in the body or head 57(63.3%) followed in decreasing order by stone in the body, head and tail 21(23.3%), fibro calcification and stone in the head of the pancreas 7(7.8%) and MPD stone and obstructed CBD due to peri-ampullary stricture 5(5.6%). The majority of the respondents had good outcomes 67(74.4%) and 23(25.6%) had poor outcome after the surgery. according to VAS pain score 0 and 2 considered as improvement. Comparing VAS scores of patients before and after lateral pancreaticojejunostomy surgery, pain improvement in postoperative period. 42(46.7%) patients had VAS score of 0 at discharge but increased at 1 month 57(63.3%) and 3 months 71(78.9%) follow up. 21(23.3%) patients who had higher VAS score at discharged reached to a VAS score of 0 or 2 at 1 month 10(11.1%) and 3 months 3(3.3%) follow up. ***Conclusion:*** Following LPJ, 74% of patients reported improved pain management. Following LPJ, a significant reduction in pain complaints was seen. It is advised that more extensive research be done to confirm these results.

**Key words:** Chronic Pancreatitis, Pancreatico Jejunostomy.



## INTRODUCTION

The exocrine and endocrine parts of the pancreas combine to form a composite gland. Eighty percent of the gland volume is made up of serous acinar cells, which make up the exocrine component of the gland. On the other hand, only 2% of the islets of Langerhans' gland structure is made up of the endocrine component. Connective tissue, ducts, nerves, and arteries make up the remaining 18%. Persistent inflammatory pancreatitis is described as an irreversible pathological alteration causing pain in the abdomen and/or permanent impairment of the exocrine and endocrine functions of the pancreas. Severe pain and, in later stages, exocrine and endocrine pancreatic insufficiency are the hallmarks of its clinical history [2].

The primary symptom of chronic pancreatitis is pain, which is treated via lateral pancreaticojejunostomy (LPJ) to relieve symptoms. The study's objective was to evaluate pain alleviation for chronic pancreatitis both before and after LPJ. Pain symptoms in chronic pancreatitis significantly improve with LPJ. The frequency of acute pain episodes and the need for analgesics have decreased [3].

In certain regions of the world, including Southeast Asia, the prevalence of chronic pancreatitis is higher (100–200 per 100 000). Sixty to seventy percent of cases of chronic pancreatitis are caused by heavy alcohol usage. Additional reasons for obstruction of the pancreatic duct include stricture formation following trauma, severe pancreatitis, or even obstruction of the duct by pancreatic cancer [4].

The most common symptom in CP is pain [5]. Usually starting in the epigastrium, pain spreads to the back. Radiation to the left or right hypochondrium is frequently observed. Patients characterize their agony as intense, ongoing, and unstoppable. It usually gets worse after eating and is linked to vomiting and postprandial nausea [6]. There are two known pain patterns. Short relapsing bouts with pain-free intervals, lasting days to weeks, are characterized by type A pain. Long-lasting, intense pain is referred to as type B pain [7].

Most individuals' precise cause of discomfort is still unknown. Many researchers think that three factors contribute to the mechanism of pain in chronic pancreatitis: 1. elevated intrapancreatic ductal pressure; 2. pancreatic inflammation; and 3. proteinaceous or fibrotic material infiltration of the coeliac plexus nerves.8

Additional signs and symptoms consist of in excess of 30% of individuals with chronic pancreatitis experience steatorrhea and diarrhoea as a result of loss of exocrine function. Diabetes mellitus develops as a result of endocrine function loss. Weight loss, vomiting, and nausea are extremely typical [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.

A jejunum loop is sutured to the pancreatic duct after the pancreatic duct is opened longitudinally in a lateral pancreaticojejunostomy (LPJ). Pain alleviation following lateral pancreaticojejunostomy ranged from 63% to 93%, according to studies conducted between 1973 and 1999 [3].

Most individuals with long-term pancreatitis can be treated conservatively and don't need surgery. Conservative care involves treating the underlying cause of the condition—pain and pancreatic exocrine and endocrine insufficiency—medically and removing the aetiological agent. When excessive alcohol consumption is the root problem, alcohol abstinence needs to be promoted. Prescription analgesics should be written based on the patient's level of pain. Supplemental pancreatic enzymes are prescribed for exocrine insufficiency. Insulin therapy or the prescription of oral hypoglycemic medications may be necessary for endocrine insufficiency.

There are two types of surgery in general. 1. The drainage process; and 2. The restorative process. In 1958, Puestow and Gillesby published a description of the drainage surgery for dilated pancreatic ducts, which involved splenectomy, amputation of the pancreatic tail, and side-to-side pancreaticojejunostomy utilizing a jejunal Roux loop.

Partington and Rochelle introduced the side-to-side pancreaticojejunostomy, which is now performed by the majority of surgeons. The distal duct drainage was combined with a splenectomy and a distal pancreatectomy in the original Puestow operation. However, the modification made later by Partington and Rochelle maintains the pancreatic tail while attempting to provide drainage of the main pancreatic duct through a spleen pancreaticojejunostomy. The operation may be undertaken in patients with intractable pain and radiological evidence of pancreatic duct dilatation with or without pancreatic duct calculi [9].

## METHODOLOGY

The cross-sectional observational study was conducted in the department of Surgery, Avicenna hospital limited, Sirajganj, Bangladesh, from October 2022 to September 2023. A total of 90 patients who underwent lateral pancreatico jejunostomy for patients with chronic pancreatitis were included in the study. Patients who matched the inclusion and exclusion criteria were approached for participation in the study. Patients who were not willing to give consent were excluded. Purposive sampling was done according to the availability of the patients who fulfilled the selection criteria. Face to face interview was done to collect data

with a semi-structured questionnaire. After collection, the data were checked and cleaned, followed by editing, compiling, coding, and categorizing according to the objectives and variable to detect errors and to maintain consistency, relevancy and quality control. Statistical evaluation of the results used to be obtained via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24).

## RESULT

**Table I: Distribution of the patients according to age (n = 90)**

| Age group | Frequency | % |
|---|---|---|
| 20 – 30 years | 25 | 27.8 |
| 31 - 40 years | 36 | 40.0 |
| 41 - 50 years | 16 | 17.8 |
| 51 - 60 years | 8 | 8.9 |
| 61 - 70 years | 5 | 5.6 |
| Total | **90** | **100.0** |

Table I shows that, with a range from 20 to 70 years, maximum 36 (40.0%) of the patients were within the age group of 31 - 40 years and minimum 5 (5.6%) of the patients were in the age 61 - 70 years.

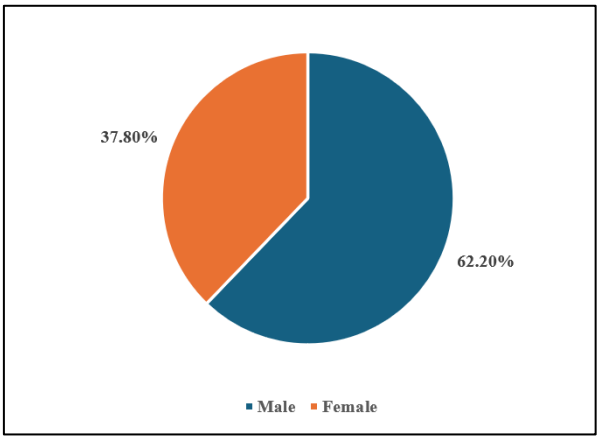


**Figure I: Distribution of the patients according to sex (n=90)**

Figure I shows that most of the patients 56 (62.20%) were male and 34 (37.80%) patients were female.

**Table II: Distribution of the patients according to average monthly income (n = 90)**

| Average monthly income (Taka) | Frequency | % |
|---|---|---|
| Low | 27 | 30.0 |
| Middle | 46 | 51.1 |
| High | 17 | 18.9 |
| Total | **90** | **100.0** |

Table II shows that most of the patients 46 (51.1%) came from middle-income families.

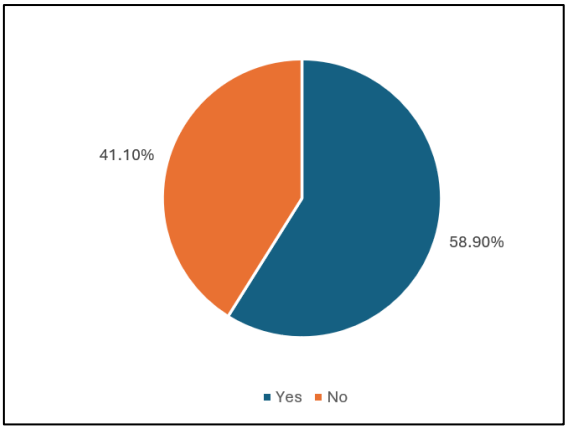


**Figure II: Distribution of patients according to history of smoking habit (n = 90)**

Figure II shows that, Majority respondents had history of smoking 53 (58.90%) and 37 (41.10%) were nonsmoker.

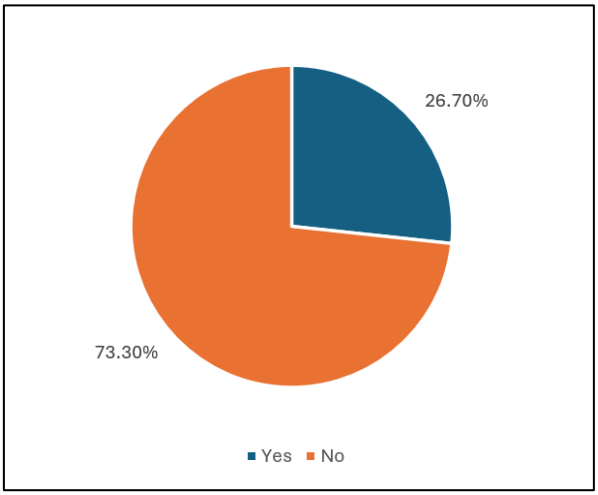


**Figure III: Distribution of patients according to history of alcohol intake (n = 90)**

Figure III shows that, majority respondents had no history of alcohol intake 66 (73.30%) and 24 (26.70%) were alcoholic.

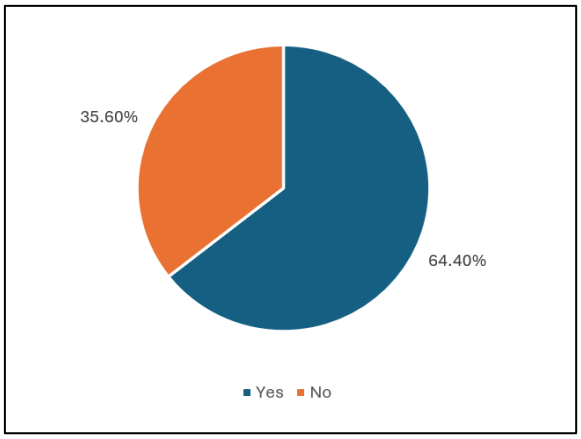


**Figure IV: Distribution of patients according to presence of diabetes mellitus (n = 90)**

Figure IV shows that, among total population 58 (64.40%) had diabetes mellitus and 32 (35.6%) did not had diabetes mellitus

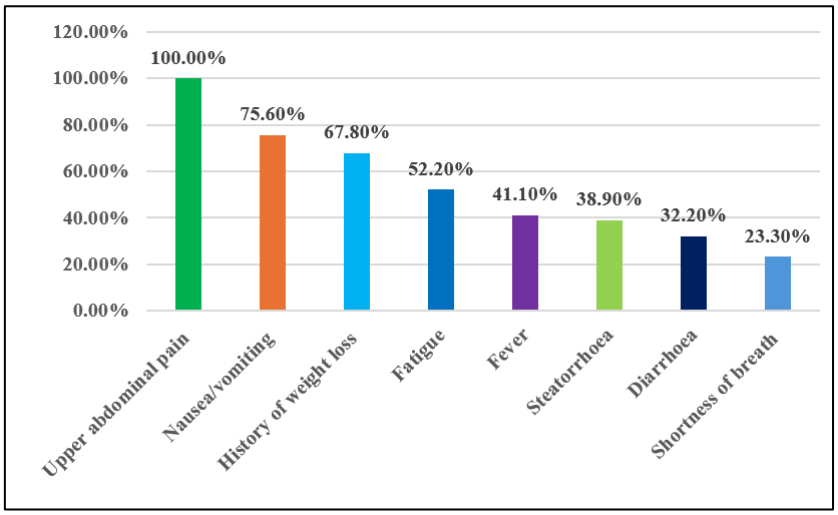


**Figure V: Distribution of patients according to presence of clinical features of chronic pancreatitis (n = 90)**

Figure V shows that, Majority of the respondents had upper abdominal pain (100%) followed in decreasing order by nausea/vomiting 68 (75.6%), history of weight loss 61 (67.80%), fatigue 47 (52.2%), fever 37(41.10%), steatorrhoea 35(38.90%), diarrhoea 29(32.20%) and shortness of breath 21(23.30%).

**Table III: Distribution of the patients according to indication of lateral pancreatico jejunostomy (LPJ)**

| Indication of lateral pancreaticojejunostomy | Frequency | % |
|---|---|---|
| Stone in the body or head | 57 | 63.3 |
| Stone in the body, head and tail | 21 | 23.3 |
| Fibro calcification and Stone in the head of the pancreas | 7 | 7.8 |
| MPD stone and obstructed CBD due to peri-ampullary stricture | 5 | 5.6 |
| Total | **90** | **100.0** |

Table III shows that, majority of the respondents had stone in the body or head 57(63.3%) followed in decreasing order by stone in the body, head and tail 21(23.3%), fibro calcification and stone in the head of the pancreas 7(7.8%) and MPD stone and obstructed CBD due to peri-ampullary stricture 5(5.6%)

**Table IV: Distribution of the patients according to Outcome of lateral pancreatico jejunostomy (LPJ) (n=90)**

| Outcome of latera pancreatico jejunostomy | Frequency | % |
|---|---|---|
| Good | 67 | 74.4 |
| Poor | 23 | 25.6 |
| Total | **90** | **100.0** |

Table IV shows that, Majority of the respondents had good outcomes 74.4% and 25.6% had poor outcome after the surgery.

**Table V: Distribution of the patients according to VAS pain score on Preoperative pain status and Postoperative pain status (n = 90)**

| Duration of hospital stay | Preoperative pain stutas (on admission) | Postoperative pain stutas (on discharge) | Postoperative pain status (on after 1 month of follow up) | Postoperative pain status (on after 3 months of follow up) |
|---|---|---|---|---|
| 0 (No Pain) | 0(0) | 42(46.7) | 57(63.3) | 71(78.9) |
| 2 (Mild Pain) | 0(0) | 27(30.0) | 23(25.6) | 16(17.8) |
| 4 (Moderate Pain) | 0(0) | 21(23.3) | 10(11.1) | 3(3.3) |
| 6 (Severe Pain) | 17(18.9) | 0(0) | 0(0) | 0(0) |
| 8 (Very severe Pain) | 49(54.4) | 0(0) | 0(0) | 0(0) |
| 10 (Worst pain possible) | 24(26.7) | 0(0) | 0(0) | 0(0) |

Table V shows that, according to VAS pain score 0 and 2 considered as improvement. Comparing VAS scores of patients before and after lateral pancreaticojejunostomy surgery, pain improvement in postoperative period. 42(46.7%) patients had VAS score of 0 at discharge but increased at 1 month 57(63.3%) and 3 months 71(78.9%) follow up. 21(23.3%) patients who had higher VAS score at discharged reached to a VAS score of 0 or 2 at 1 month 10(11.1%) and 3 months 3(3.3%) follow up

## DISCUSSION

The clinical course of chronic pancreatitis is variable and unexpected, ultimately leading to significant malfunction of the exocrine and endocrine glands. About 90% of patients have persistent and intractable pain as their primary clinical feature, which may have the worst effect on quality of life. Surgery can help reduce pain in carefully chosen patients and is suggested for complications of chronic pancreatitis, such as pseudo-cyst development, biliary blockage, and duodenal obstruction [10]. There are established uses for Lateral Pancreaticojejunostomy (LPJ) in the treatment of Chronic Pancreatitis (CP). Patients with dilated pancreatic ducts and excruciating discomfort are candidates for this procedure. Increased intraductal pressure and parenchymal ischemia result from ductal obstruction by stone or stricture. The greatest way to reduce discomfort and slow the disease's progression is through surgical decompression of the duct and ductal drainage [11]. By allowing the leftover pancreatic secretions to enter the intestine and aid in digestion, pancreaticojejunostomy prevents the sacrifice of functional pancreatic tissue. The low percentage of our patients in need of pancreatic enzyme replacement serves as an example of this benefit of drainage [12].

The cross-sectional observational study was conducted in the department of Surgery, Avicenna hospital limited, Sirajganj, Bangladesh, from October 2022 to September 2023. A total of 90 patients who underwent lateral pancreatico jejunostomy for patients with chronic pancreatitis were included in the study.

In this study, with a range from 20 to 70 years, maximum 36 (40.0%) of the patients were within the age group of 31 - 40 years and minimum 5 (5.6%) of the patients were in the age 61 - 70 years. In another study showed 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 most of the patients 56 (62.20%) were male and 34 (37.80%) patients were female. Another study showed 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 [14]. 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 patients 46 (51.1%) came from middle-income families. In another 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%). Accordingto 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 [15].

In this study, the majority of respondents had history of smoking 53 (58.90%) and 37 (41.10%) were nonsmoker. The majority of respondents had no history of alcohol intake 66 (73.30%) and 24 (26.70%) were alcoholic. Another 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 [16]. 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 inadaptive responses in the neurohormonal control of pancreatic secretion to maintain normal pancreatic enzyme output despite inhibitory effects of alcohol on neurohormonal reflexes [17].

Among total population 58 (64.40%) had diabetes mellitus and 32 (35.6%) did not had diabetes mellitus. 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 [16].

In our study, majority of the respondents had upper abdominal pain (100%) followed in decreasing order by nausea/vomiting 68 (75.6%), history of weight loss 61 (67.80%), fatigue 47 (52.2%), fever 37(41.10%), steatorrhoea 35(38.90%), diarrhoea 29(32.20%) and shortness of breath 21(23.30%). In another 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 [18]. 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 [19].

In our study, majority of the respondents had stone in the body or head 57(63.3%) followed in decreasing order by stone in the body, head and tail 21(23.3%), fibro calcification and stone in the head of the pancreas 7(7.8%) and MPD stone and obstructed CBD due to peri-ampullary stricture 5(5.6%). Another study showed, 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 [20].

According to this study, the majority of the respondents had good outcomes 67(74.4%) and 23(25.6%) had poor outcome after the surgery. In another study, about 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 [21]. Lateral pancreaticojejunostomy has also been combined with local resection of the head of the 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 [22]. 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 [20] 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 surgicaloutcome [23].

In our study, the result showed pain status according to VAS pain score 0 and 2 considered as improvement. Comparing VAS scores of patients before and after lateral pancreaticojejunostomy surgery, pain improvement in postoperative period. 42(46.7%) patients had VAS score of 0 at discharge but increased at 1 month 57(63.3%) and 3 months 71(78.9%) follow up. 21(23.3%) patients who had higher VAS score at discharged reached to a VAS score of 0 or 2 at 1 month 10(11.1%) and 3 months 3(3.3%) follow up. In another 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 [24]. In Abhishek *et al.,* study they also found that there was significant improvement between preoperative pain status and postoperative pain status. Immediately post-surgery follows up, complete pain relief was seen in 100% patients which correspondents with our study [21]. Patients who undergo surgery as their initial treatment for chronic pancreatitis require fewer consecutive interventions, a shorter hospital stay and have a better quality of life compared with any other treatment [20].

## CONCLUSION

Following LPJ, 74% of patients reported improved pain management. Following LPJ, a significant reduction in pain complaints was seen. It is advised that more extensive research be done to confirm these results.

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