

A study of postcholecystectomy syndrome after laparoscopic cholecystectomy

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Abstract

Introduction- The commonest, albeit most elusive postcholecystectomy syndrome is flatulent dyspepsia, a term which encompasses various and generally coexisting symptoms including early satiety, postprandial epigastric and right upper quadrant pain or discomfort, flatulence, nausea, eructation and fatty food intolerance.

Material and methods- Study population are patients, those who underwent laparoscopic cholecystectomy in Department of General Surgery, Regional Institute of Medical Science, Imphal during the September 2015 to August 2017.

Result- Here in 25-34 years age group total cases of PCS were 3. But the percentage of PCS among this age group was 27.2%. Followed by 45-55 years and >55 years age group (25%). Highest cases were among the age group of 35-44 years (6 cases). But the percentage of PCS was 20.6%. So the higher incidence of PCS was among age group 25-34 years followed by >45 years. But the difference were statistically not significant ($p < 0.005$).

Conclusion- The present cohort study of 61 cases was conducted to assess postcholecystectomy syndrome among post laparoscopic patients attending hospital for follow up. The age group most commonly affected by cholelithiasis was of 35- 44 years, with mean age of 38.9 years, most commonly in female and urban population. Most of the patients were from middle income group and had sedentary life style.

Date of Submission: 01-12-2022

Date of Acceptance: 12-12-2022

I. Introduction

Laparoscopy is defined as the telescopic visualization of the abdomino-pelvic cavity through small incision made on the abdominal wall with various instruments.¹ This instrumentation technique was developed as a science at the turn of this century.² This technique was primarily used for the diagnostic purpose of the intra-abdominal pathology.

Although laparoscopy has been used over many years by the gynaecologists to evaluate the pelvic pathology, most general surgeons did not recognise its importance.² In 1987, the first laparoscopic cholecystectomy was performed by Philip Mouret in France.^{3,4} Almost simultaneously, Mc Kernan Saye performed Laparoscopic Cholecystectomy in the United States in 1988.⁵ Mr Reddick and Osten are credited with the first report of laparoscopic cholecystectomy in the English literature. Over these last several years, this minimally invasive procedure has emerged worldwide as the preferred treatment of choice for patient with uncomplicated cholelithiasis and cholecystitis. Laparoscopic technique has largely replaced the traditional method of performing open cholecystectomy except in some complicated cases.^{6,7}

The most common indication of surgical removal of gall bladder is recurrent biliary colic. There has been no established criteria for how many episodes are tolerated before cholecystectomy should be recommended and this decision generally decided by both the symptoms of the patient and the experience of the surgeon. Benefits in comparison to conventional laparotomy are shorter effects on pulmonary function, less postoperative pain, earlier recovery of peristalsis, short hospital stay, faster post operative recovery and minimal scar. However, patients often suffer from considerable pain during the first 24 postoperative hours.⁸

It is commonly accepted that removal of the gallbladder is the best treatment for symptomatic gallstone disease. However, less focus has been on patient selection and typical or common symptoms of this disease in order to understand prevailing symptoms after surgery.⁹⁻¹² Although disease severity has been used,¹³⁻¹⁵ these efforts have not been united into useful and widely accepted working terms for preoperative clinical use and outcome assessment. As a consequence, the indication for cholecystectomy is sometimes vague and assessment of outcome suffers accordingly.¹⁶

In upto 15% of patients, cholecystectomy fails to relieve the symptoms for which operation was performed. Such patients may have considered having a postcholecystectomy syndrome. However, such problems are usually related to the preoperative symptom and merely a continuation of those symptoms. Full investigation should be undertaken to confirm the diagnosis and exclude the presence of a stone in the cystic duct stump or operative damage to the biliary tree. The best performed by MRCP or ERCP, the latter which has the added advantage that if a stone is in the common bile duct it can be removed.¹⁷

Symptom that occurs after gallbladder surgery can be divided into two groups.

a). Symptoms attributable to the biliary (most of which result from inadequate surgery): common bile duct calculi, gallbladder remnant, cystic duct remnant, obstruction of common bile duct, i). stricture ii). fibrosis or spasm of sphincter of oddi, injury to common bile duct and pancreatitis.

b). Symptoms attributable to common conditions extrinsic to the biliary tract: peptic ulcer, diaphragmatic hernia, spastic colon, right renal disease, irritable bowel syndrome.¹⁸

During laparoscopic and open cholecystectomy, is an unusual but devastating complication. Inflammation in the aorta, variable biliary anatomy, inappropriate exposure, aggressive attempt at haemostasis, and surgeon experience are commonly cited risk factor. In the setting of biliary leakage, patient may present with fever, increasing abdominal pain, jaundice, or bile leakage from an incision. Alternatively, injury to the bile duct that does not leak bile will usually present with jaundice, with or without pain. Although unusual, pain similar to biliary colic persists or recurs following cholecystectomy. Other biliary tree phenomenon may cause a similar picture, such a sphincter of oddi dysfunction. Postoperative bile duct stricture, which usually present with jaundice, are generally identified within first year following cholecystectomy and may persist with pain and fever if only one lobar duct is obstructed. In the setting of a normal liver panel, other cause of right upper quadrant pain should be investigated.¹⁹

The concept of cystic duct stump²⁰ syndrome includes repeated attacks of biliary colic, nausea, vomiting, jaundice, chills and fever. Although this symptoms probably indicates common bile duct stone and cholangitis, it has been suggested that the presence of the cystic duct remnant alters pressure in the biliary tract and sphincter of oddi after cholecystectomy.²¹ Postoperative biliary distress was caused by new stone formation, amputation neuroma, and adhesion associated with the cystic duct remnant and leading to kinking of the common bile duct.²²

Papillary stenosis was described as a result of acute or chronic inflammation of the papilla of Vater. Stenosing papillitis is the consequence of chronic passage of gallstones.²³

In the process of identifying the cause of postcholecystectomy syndrome, it is important to differentiate between pancreatobiliary disease and disease external to the biliary tract. It was found that 40 % of the patients with postcholecystectomy symptoms had diseases outside the biliary tract (i.e., gastritis or ulcer, functional intestinal disease, colonic diverticulosis, chronic pancreatitis and carcinoma of the colon). The elimination of an extrahepatobiliary pathologic process should suggest that the patient has either an organic (stone, stricture, or pancreatitis) or a functional (biliary dyskinesia, or papillary stenosis) biliary disorder. Patient with history of acute upper abdominal pain associated with jaundice, fever, and chills usually have a common bile duct stone. By contrast, chronic pain of moderate severity without other symptoms generally suggest stenosing papillitis or biliary dyskinesia.²³

The commonest, albeit most elusive postcholecystectomy syndrome is flatulent dyspepsia, a term which encompasses various and generally coexisting symptoms including early satiety, postprandial epigastric and right upper quadrant pain or discomfort, flatulence, nausea, eructation and fatty food intolerance.²⁴ The basic mechanism responsible for flatulent dyspepsia, including fatty food intolerance. It, therefore, suggest that symptoms could be due to a mechanism other than gall bladder disease and common to all patients with the same symptoms. Using a radiological technique it was found that duodenogastric reflux commonly occurred in dyspeptic patients with and without gall bladder disease. Reflux was regarded as a functional disturbance which directly gives rise to symptoms but might also be expected to predispose to symptomatic 'bile gastritis'.²⁵ There are instances in which an abnormality of the parasympathetic or the sympathetic innervations can produce spasm or increase in tone of the sphincter of Oddi which conceivably produce sufficient back pressure and distension of the common bile duct to cause pain.²⁶

In general the cause of Postcholecystectomy syndrome can be classified into three groups:

A). The symptom of the initial presentation, i.e., cholecystitis are not related to gallstones

B). A surgical error, i.e, leaving stone behind, injury to the ducts or any other surgical complications e.g. fluid collection, scar....etc.

C). A new disease, either of the biliary tract or other system.²⁷

However, it is not a syndrome and the term is confusing. It was originally defined as a pure functional disturbance after cholecystectomy. Loss of gall bladder function alone is not followed by serious symptoms. In addition, these symptoms have been found to be related to retained stones, stenosis of sphincter of oddi and long cystic duct stump. Symptoms attributable to surgical procedure proper deserve the term postcholecystectomy

syndrome. The term has also been used where no organic cause of pain or symptoms could be found. The reported incidence of post-cholecystectomy symptoms ranges between 4-40% depending upon thoroughness of follow-up and diagnostic work up. An organic cause can be found in 50% of cases of postcholecystectomy symptoms. Postcholecystectomy syndrome has also been classified into true syndrome (due to disorders of biliary system, pancreas and sphincter of oddi) and false syndrome due to symptoms arising from adjacent organs. Treatment depends upon the cause. Nitroglycerine preparation or nifedipine for sphincter of oddi dysfunction. Alternatively spasmolytic and analgesic for temporary relief of pain. Surgical sphincterotomy and sphincteroplasty and septectomy are procedure with high success rates in treating postcholecystectomy syndrome with biliary causes, especially stenosing papillitis or biliary dyskinesia. Different studies indicated that 75-88% is completely relieved of their preoperative symptoms.

The incidence of gallbladder disease has been increasing in Manipur. The number of gallbladder operations, both open and mainly laparoscopic procedures, has also been increasing correspondingly.

The success of a procedure depends upon completion of the procedure without any complication and improvement in the symptoms for which the operation was planned. It is therefore necessary to know the patient's perspective on improvement for which the operation was done.

This study was carried out to ascertain the influence of laparoscopic cholecystectomy on relief of symptoms of gall bladder disease and analysis of postcholecystectomy symptoms.

II. Review Of Literature

Cholecystectomy as a treatment of symptoms should only be done if symptoms can definitely be ascribed to gall bladder disease. Cholecystectomy in a certain number of patients fails to relieve symptoms. Persistence or appearance of such symptoms compatible with biliary disease has been variously designated by terms such as biliary dys-synergia, biliary dyskinesia and post-cholecystectomy syndrome. However, it is not a syndrome and the term is confusing. It was originally defined as a pure functional disturbance after cholecystectomy. Loss of gall bladder function alone is not followed by serious symptoms. In addition, these symptoms have been found to be related to retained stones, stenosis of sphincter of oddi and long cystic duct stump. Symptoms attributable to surgical procedure proper deserve the term post-cholecystectomy syndrome. The term has also been used where no organic cause of pain or symptoms could be found. The reported incidence of post-cholecystectomy symptoms ranges between 4-40% depending upon thoroughness of follow-up and diagnostic work up.¹⁸

Wilson RG et al²⁸ evaluated that after laparoscopic cholecystectomy prevalence of abdominal pain, nausea, flatulence, food intolerance and heart burn was similar in open cholecystectomy. This study was performed by sending a standard symptom questionnaire at least 1 year after surgery among 115 patients who had undergone laparoscopic cholecystectomy and 200 patients who had undergone open cholecystectomy. Patient who underwent laparoscopic cholecystectomy tended to higher incidence of nausea or vomiting and consumed significantly more antacid. Laparoscopic cholecystectomy achieved the same rate of patient satisfaction as open cholecystectomy.

Ure BM et al²⁹ conducted a continuing prospective study aimed to assess long term results after laparoscopic cholecystectomy. It showed that eight specific symptoms were sought non-colicky pain, colicky pain, abdominal distension, nausea, vomiting, loss of appetite, flatulence and dietary restriction. Two result after each operation was assessed by two surgeons and by the patient. They found that 30.5 % still had abdominal complaints but they were willing to cope with those symptoms. In 3.2% the result was unsatisfactory. Statistical analysis of 26 variables showed few significant differences between patients with excellent results and patients with persisting or new symptoms. The percentage of patients with biliary colic was reduced to 82.9% before to 6.4% after laparoscopic cholecystectomy. Flatulence persisted in significant patients who had not complained of flatulence before the operation. It is concluded that the long term results of laparoscopic cholecystectomy in patients with symptomatic gallstone disease were excellent but the prognosis in individual patients was unpredictable.

Lublin M et al¹⁴ in 1989-1995 evaluated that pain and non pain symptoms were present after laparoscopic cholecystectomy. Postoperatively, pain and nonpain symptoms were present in 25% and 43% patients, respectively. Persistent nonpain symptoms were more likely if diarrhea, fatty food intolerance. All nonpain symptoms were significantly reduced postoperatively except for diarrhea. Longer duration of pain, age < 40, and frequent episodes of pain, postprandial pain, and increased sites of pain preoperatively were all predictive of a higher incidence of persistent postoperative pain. Persistent nonpain symptoms were more likely if diarrhoea, fatty food intolerance, age < 40, or both pain and nonpain symptoms were present preoperatively and less likely if only pain symptoms were present preoperatively. With these data, surgeon can modulate postoperative expectations and advise on the possible persistence of symptoms.

Borly L et al³⁰ performed a prospective study to investigate whether preoperative variables could predict the symptomatic outcome after cholecystectomy. In this study a preoperative questionnaire on pain, symptoms, and history was completed, and the questions on pain and symptoms were repeated 1 year postoperatively. Eighty patients completed all questionnaires. Twenty-one patients continued to have abdominal pain after the operation. Patients with pain 1 year after cholecystectomy were characterized by the preoperative presence of a high dyspepsia score, 'irritating' abdominal pain, and an introverted personality and by the absence of 'agonizing' pain and of symptoms coinciding with pain. In a constructed logistic regression model 15 of 18 predicted patients had postoperative pain. Of 62 patients predicted as having no pain postoperatively, 56 were pain-free. Overall accuracy was 89%. From this prospective study a model based on preoperative symptoms was developed to predict postcholecystectomy pain.

Niranjan B et al³¹ did a study and analysed that laparoscopic cholecystectomy significantly relieved symptoms of gall stone disease. Biliary pain, nausea, vomiting and sour eructation's had better outcome compared to belching, flatulence and heartburn, which were also relieved in majority. Postcholecystectomy post-prandial diarrhoea was a significant new symptom after cholecystectomy. Pre-operative flatulence and heartburn were risk factors for poor symptom relief. All patients should be preoperatively counselled about the risk of persistence of some non-pain symptoms after laparoscopic cholecystectomy.

Vender GC et al³² did a survey and concluded that the pre and postoperative symptoms and outcome after surgery in patients with symptomatic gall stone disease were evaluated by a detailed self administered postal questionnaire. The survey was conducted in two groups: 80 patients treated by laparoscopic cholecystectomy and an age matched cohort of patients who had conventional open cholecystectomy. Symptomatic benefit ratios accruing from the surgical removal of the gall bladder were calculated. The symptoms that were relieved by cholecystectomy were nausea (0.98), vomiting (0.91), colicky abdominal pain (0.81), and backpain (0.76). Flatulence, fat intolerance, and nagging abdominal pain were unaffected as shown by a benefit ratio of 0.5 or less. Relief of heartburn outweighed the de novo development of this symptom after cholecystectomy, resulting in a benefit ratio of 0.65. Postcholecystectomy diarrhoea occurred in 18%: 10 after open cholecystectomy and 11 after laparoscopic cholecystectomy. The type of surgical access did not influence the symptomatic outcome but had a significant bearing on the time to return to work or full activity after surgery (laparoscopic cholecystectomy two weeks, open cholecystectomy eight weeks, $p=0.00001$). In the elderly age group (> 60 years), significantly more patients regained full activity after laparoscopic cholecystectomy when compared with the open cholecystectomy group. The patient appreciation of a satisfactory cosmetic result was 72% in the open group compared with 100% of patients who were treated by laparoscopic cholecystectomy ($p=0.0017$).

Schimdt M et al³³ did a study of one hundred and fifty three patients with a clinical and ultrasonographic diagnosis of gallstones filled out a structured questionnaire on abdominal pain symptoms and functional gastrointestinal disorder (FGID) before and at six months after cholecystectomy. Symptom frequency groups were categorized according to pain was cured or improved in about 90% of patients and two-thirds of patients obtained complete symptom relief. Patients with the most frequent pain episodes were less likely to obtain symptom relief. FGID was present in 88% of patients pre-operatively and in 57% post-operatively. Those that became asymptomatic or improved with regard to pain also had most relief from FGID.

Lill S et al³⁴ did a study on 1,101 patients and analyse that two hundred and forty-eight (37%) patients continued to have abdominal symptoms after the operation. Among those with predominantly mild abdominal symptoms preoperatively, 119 (41%) reported the persistence of symptoms after the operation, while in the group with mainly severe upper abdominal pain attacks, 129 (33%) patients had recurrences. According to data, more than one-third of patients with symptomatic uncomplicated gallstone disease experienced persistent symptoms after elective laparoscopic cholecystectomy. Patients with mild preoperative symptoms seemed to have more recurrences than those with severe symptoms, although the difference was not statistically significant.

Aspevik RK et al³⁵ did a study with 211 patients and found that sudden attacks of pain are likely to be relieved after cholecystectomy. Patients also experienced a number of different types of discomfort both before and after the cholecystectomy. After surgery patients reported a significant reduction in symptoms like sudden pain, constant pain, nausea/vomiting and bloating. 94% were very satisfied or satisfied with the outcome; 1% regretted having undergone the procedure.

Kim GH et al³⁶ did a study with sixty-five patients who underwent LC for uncomplicated gallbladder stones or gallbladder polyps. The patients were surveyed on their dyspeptic or colonic symptoms before surgery and again at 3 and 6 months after surgery. Forty-four patients showed one or more dyspeptic or colonic symptoms before surgery. This study assessed whether nonspecific gastrointestinal symptoms improved after laparoscopic cholecystectomy (LC) and identified the characteristics of patients who experienced continuing or exacerbated symptoms following surgery. These patients reported lower postoperative satisfaction. Elective laparoscopic cholecystectomy improves dyspeptic or colonic symptoms. Approximately 19% of patients reported continuing or exacerbated symptoms following laparoscopic cholecystectomy. He evaluated that

detailed history taking regarding gastritis before surgery could be helpful in predicting patient's outcome after laparoscopic cholecystectomy.

Weinert CR et al³⁷ did a secondary analysis of a prospective, multisite cohort study of 2481 patients undergoing elective cholecystectomy and assessed that patients who identified a symptom as most bothersome before surgery still had the symptom 6 months after surgery. Symptom persistence rates ranged from 5.6% (vomiting) to 40.2% (gas/flatulence). He found that a balance score that quantified the abdominal symptom mix between dyspeptic and biliary symptoms shifted after surgery to the dyspeptic category.

Stiff Get al³⁸ did a study and found that persistent symptoms after cholecystectomy were common, occurring in up to 40 % of patients. Right upper quadrant pain was more common in open cholecystectomy. Indigestion and heartburn were equally relevant in the two groups. Symptoms were the same or worse in 10.3 % of patients after open cholecystectomy compared with 4.9 % after the laparoscopic operation. Patients reported significantly less right upper quadrant pain after laparoscopic than after open cholecystectomy.

Hyvarinen H et al³⁹ in 1987, a retrospective study assessed 918 patients who had undergone upper endoscopy, finding that the 125 postcholecystectomy patients were more likely to have erosive esophagitis and duodenogastric reflux than 793 controls who had not undergone cholecystectomy. The results of that study also suggested that in symptomatic outpatients a previous cholecystectomy was associated positively with oesophagitis and gastric ulcer, but not with duodenal ulcer.

Rogy MA et al⁴⁰ evaluated the role of cystic duct stump in postcholecystectomy syndrome in 322 patients undergoing second operation on bile duct after cholecystectomy and found 35 (10.8%) patients with long cystic duct stump (>1.5 cm). Of those, 24 had other pathological findings besides long stump. Of the remaining 11, eight had stone in partial gall bladder or cystic duct stump, one had suture granuloma, one had fistula between cystic duct and duodenum and only one patient had long cystic duct as the sole pathological finding. They concluded that cystic duct stump was hardly ever a cause of recurrent symptoms in itself and total excisions of cystic duct did not eliminate the existence of post cholecystectomy symptoms.

Walsh RM et al⁴¹ reviewed seven cases with calculi retained in gall bladder and cystic duct remnants that presented with recurrent biliary symptoms. They concluded that retained gall bladder and cystic duct calculi can be a source of recurrent biliary pain and said that this entity could be prevented by accurate identification of gall bladder cystic duct junction at cholecystectomy. Although rare, recurrent cholelithiasis involving cystic duct stump was the cause massive dilatation and should be a differential diagnosis of postcholecystectomy syndrome.

Kjeligren K et al⁴² did a study and concluded that 49% of the patient reported postoperative pain symptoms. Deduction of the patients who had only sporadic dyspepsia, which could be regarded as "normal", reduces this figure to 33 %. 4 % of the patients had attack of pain resembling biliary colic and 15 % had more indefinite abdominal pain. The most common postoperative disturbances were dyspeptic with or without pain.

Warshaw AL et al⁴³ did a study on ten patients with typical bile gastritis who had no prior gastric surgery. Clinical symptoms included burning epigastric pain unrelieved by food or antacid, episodic nausea, and vomiting of bile. In all patients the symptoms appeared after cholecystectomy, with (4 patients) or without (6 patients) transduodenal sphincterotomy; the symptoms were often initially attributed to chronic pancreatitis. Six patients had hypochromic, microcytic anaemia. Eight patients had basal achlorhydria; stimulated acid secretion was low or absent in seven patients. Gastroscopic examination revealed gastritis, most prominent in the prepyloric antrum, and abundant bile lakes. Mucosal biopsy disclosed chronic gastritis. Although medical therapy failed, seven of eight patients treated by vagotomy, hemigastrectomy, and long Roux-en-Y gastrojejunostomy had immediate and sustained relief. Cholecystectomy appears to be a critical factor in the pathogenesis of bile gastritis in patients who have not had prior gastric surgery. Without the reservoir function of the gallbladder, the unregulated flow of bile into the duodenum probably promotes the access of bile to the unprotected gastric mucosa.

Luman W et al¹⁰ did a study in 1994-1995 and concluded that 13 % reported pain similar to that presented before surgery. Preoperative abdominal bloating, constipation, and the use of psychotropic drugs were more common in these patients.

Qureshi MA et al⁴⁴ did a study with 100 patients and analysed that patients' perceptions of postoperative symptoms and global satisfaction. They noted that 25% of patients complained of more than two symptoms postoperatively but 84% considered the procedure to be a complete success. Sixty-one patients had complete absence of symptoms postoperatively, 14 patients complained of only one symptom during the postoperative period, and 25 patients continued to have at least two symptoms postoperatively. The most common symptoms postoperatively were pain related to food, abdominal pain, dyspepsia, flatulence and abdominal bloating. Symptoms of dyspepsia, abdominal bloating and increased flatulence appear to be least improved after laparoscopic cholecystectomy.

Ros E et al²⁴ evaluated 93 patients two years after cholecystectomy. Only 53 patients were completely free of symptoms. Other patient was suffering from postcholecystectomy symptoms.

Konsten J et al⁴⁵ followed up over 300 Dutch patients through postal questionnaires to their general practitioners at a median interval of 10 years after cholecystectomy and reported symptoms in 18%. Stone recurrence was found in five patients (1.5%); ten others (3.1%) had biliary tract-related complaints during follow-up. There were no laboratory findings associated with biliary obstruction. Patients with typical symptoms of gallstone disease before surgery had significantly fewer complaints during follow-up than those with typical as well as atypical symptoms (14.8 versus 26.5%, $P < 0.02$). However, most of these complaints were not related to the procedure. It was concluded that the majority of patients reported no complaints or postcholecystectomy symptoms 10 years after surgery.

Fenster LF et al⁴⁶ found that most patients (82 %) with biliary colic and gallstones have complete relief of upper abdominal pain after cholecystectomy. Pain relief in patients felt to have acalculous cholecystitis was only 52%. Nonpain symptoms were common preoperatively (82%) and were relieved in 44% of patients.

Scriven MW et al⁴⁷ did a study with 77 patients and specific symptoms were recorded preoperatively and at one year postoperatively. All symptoms inquired about reduced in frequency postoperatively, the best cures being achieved for jaundice, upper abdominal colic, fatty food intolerance and back/ shoulder pain. A third of patients developed at least one new symptom during the year of follow up. 77% graded themselves either completely or well satisfied. It was not possible to predict from preoperative symptoms those who would be dissatisfied or those who develop a new symptom.

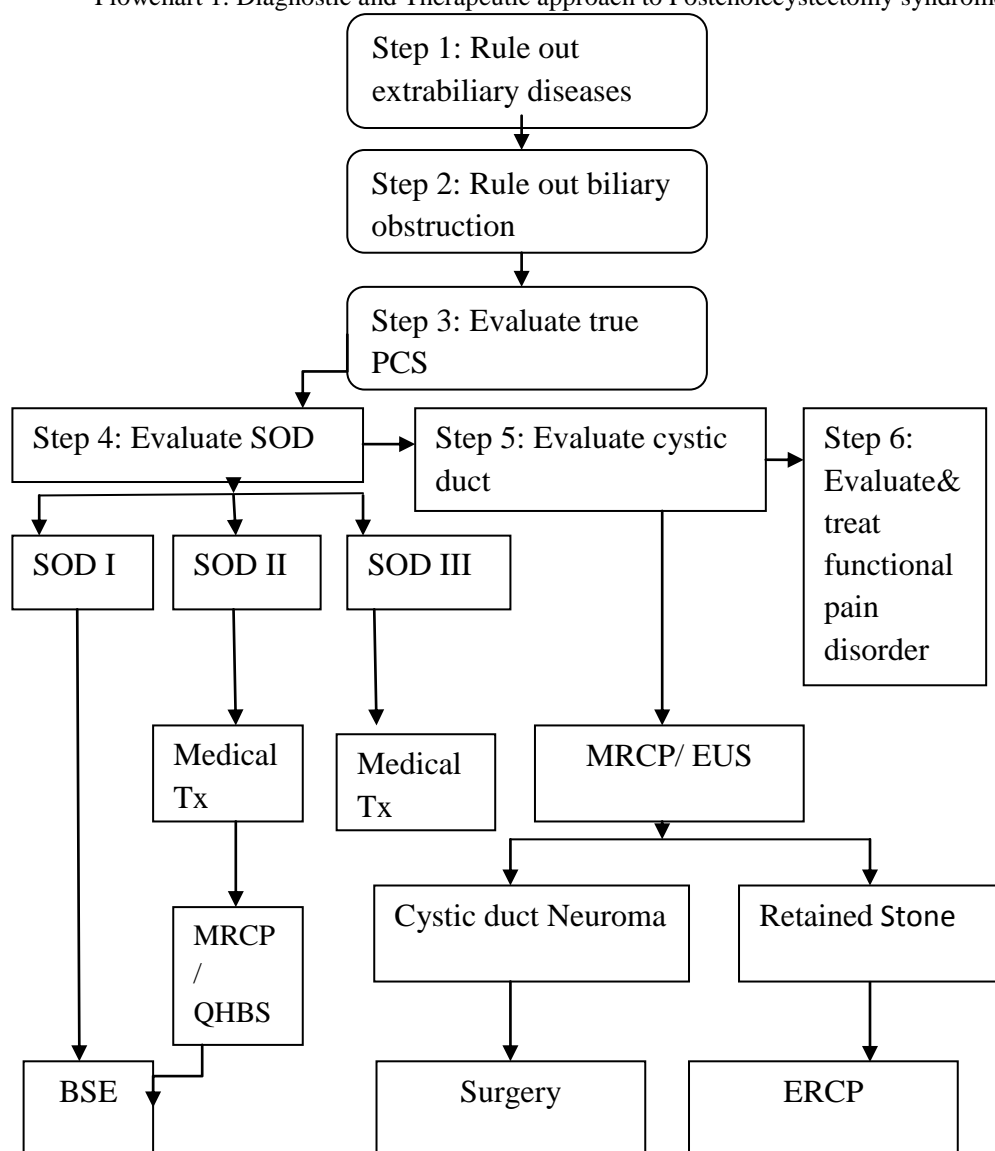
Bates T et al¹² found in his study 73% pain free, 58% free from dyspepsia, 81% free from nausea, 90% free from vomiting after cholecystectomy for symptomatic gall stone. However, 1 year after cholecystectomy 34% of patients still suffered some abdominal pain.

Robert D. Kung et al⁴⁸ reviewed the etiologies of postcholecystectomy syndrome. They also gave an algorithm on diagnostic and therapeutic approach to postcholecystectomy syndrome. With recent suggestions of a diverse and complex pathogenesis, clinicians should employ this systematic approach to diagnose and treat a range of potential etiologies. The first step in the evaluation of a PCS patient should be a thorough history and physical examination to rule out common treatable conditions which sometimes overlooked. Assessment for *H. pylori* infection, peptic ulcer disease, gastroparesis, amongst other disorders, should be initiated in the right clinical setting. Signs of extrahepatic obstruction warrant prompt evaluation with liver function tests and ERCP. EUS may be employed to verify absence of obstruction in patients with low suspicion for it. The workup for true PCS should begin with differentiating functional pain from biliary pain, and Rome III criteria may be employed in this process. Having excluded a functional etiology, practitioners should evaluate patients for SOD. If the workup is negative, a multidisciplinary approach with pain management and psychiatry may be appropriate. He also evaluated that nifedipine reduced the severity and frequency of pain, and need for analgesics compared to the placebo group. Pancreatic enzyme supplementation has been reported to reduce dyspeptic symptoms, but have no effect on pain symptoms.

Table 1. Etiology of Postcholecystectomy syndrome.⁴⁸

Extrabiliary	Organic biliary	Functional Biliary
GERD	Choledocholithiasis	Sphincter of Oddi dysfunction
Gastritis	Chronic pancreatitis	Biliary microlithiasis
Gastroparesis	Pancreatic cancer	Visceral hypersensitivity/ hyperalgesia
Irritable bowel syndrome	Cholangiocarcinoma	Somatosensory hyperalgesia
Peptic ulcer disease		Remnant cystic duct
Nonulcer dyspepsia		Retained calculi
Duodenal motility abnormality		Neuroma
Narcotic bowel		Hyperalgesia
Duodenal diverticula		
Malignancy		
Abdominal wall pain (associated with carnet sign)		
Chest wall tenderness		
Costochondritis		

Flowchart 1. Diagnostic and Therapeutic approach to Postcholecystectomy syndrome.⁴⁸



III. Aims and Objects

1. To assess the incidence of postcholecystectomy syndrome after laparoscopic cholecystectomy for symptomatic gallstone disease.
2. To analyse the group of patients who have higher incidence of postcholecystectomy syndrome after laparoscopic cholecystectomy for symptomatic gallstone disease.

IV. Material and Method

Study design:

Cohort study.

Set up:

Hospital based study was conducted in the Department of General Surgery, Regional Institute of Medical Science (RIMS), Imphal, Manipur.

Study period:

This study was carried out for a period of 2 years from September 2015 to August 2017.

Study population:

Patients, those who underwent laparoscopic cholecystectomy in Department of General Surgery, Regional Institute of Medical Science, Imphal during the study period.

Inclusion criteria:

All patients after laparoscopic cholecystectomy for symptomatic gallstone were included in the study irrespective of age, sex, religion.

Exclusion criteria:

- i. Patients, those who underwent operation other than laparoscopic cholecystectomy.
- ii. Laparoscopic cholecystectomy was done for other biliary disease e.g. carcinoma other than cholelithiasis and acalculus cholecystitis.
- iii. Patients who were not willing to participate.

Sample size:

Patients, those who underwent lap cholecystectomy between October 2015 and September 2017 in the Department of Surgery, RIMS Hospital, were taken up for study. Study sample was calculated from the formula

$$n = \frac{4pq}{l^2}$$

P = prevalence of postcholecystectomy syndrome after laparoscopic cholecystectomy = 4% = 0.04

q = (1-0.04) = 0.96

l = Margin of error = 5% = 0.05

61 patients were considered as sample size.

Study variable:

The study was conducted under the following variables:

- i). Age.
- ii). Sex.
- iii). Duration of follow up.
- iv). Socioeconomic status.

Working definition:

Postcholecystectomy syndrome, this term is used to describe a heterogeneous collection of postcholecystectomy complaints after cholecystectomy.

In this study flatulent dyspepsia is a symptom which defined as stomach upset with frequent eructations of swallowed air.

Study Tools:

1. Ultrasound (SONOACEX8, MEDISON.CO.LTD-INDIA).
2. CT scan (BRILLIANCE CT-PHILIPS MEDICAL SYSTEM CLEVELAND USA SFDA20083303600).
3. X-ray (FLUOROVISION3000-SIEMENS-INDIA.03106-SIRECON3-3HDR-DQ).

Outcome Variable:

The outcome variables of this study were:

- Right upper quadrant pain
- Flatulent dyspepsia
- Abdominal discomfort
- Eructation.
- Diarrhoea
- Jaundice with or without pain.
- Fatty food intolerance

Study group:

All patients after laparoscopic cholecystectomy for symptomatic gallstone were included in the study group irrespective of age, sex, religion.

Control group:

There was no control group in the study.

Method of recruitment:

All cholelithiasis patients who underwent laparoscopic cholecystectomy and fulfilled the inclusion criteria during the study period, were selected by consecutive sampling. So all accessible patients were taken as part sample till the sample size was fulfilled.

Procedure:

- A. Systematic and methodical entry of records of patients admitted at RIMS Hospital was done.
- B. Detailed history and complete clinical examination of the cases were recorded.

- C. Routine investigations included were
- a) Complete haemogram
 - b) Urine (routine and microscopy)
 - c) Kidney function test with serum electrolytes
 - d) Liver function test
 - e) HBsAg, HCV-Ab, R-Ab
 - f) Blood sugar(random or fasting/PP)
 - g) Serum amylase and lipase
 - h) Chest X- Ray
 - i) ECG
 - j) BT,CT
 - k) T3, T4 and TSH
- D. The cohorts were undergone transabdominal ultrasonography as it is a sensitive, inexpensive, reliable and reproducible test to evaluate most of the biliary system. It also identifies CBD stones. Upper GI endoscopy, CT scan Abdomen, Magnetic Resonance Imaging and ERCP of the abdomen was done when need arises.
- E. The cohorts were followed up in the consecutive interval of 2 weeks, 1 month, and 3 months after the discharge. Postoperative signs and symptoms were analysed. Incidence among different group of people was identified.

Data collection:

All cases of postcholecystectomy patients who underwent laparoscopic cholecystectomy fulfilling the inclusion criteria were studied and recorded in the prescribed proforma for the thesis data collection.

Data management and Statistical analysis-

- Data were checked for consistency and completeness.
- Data were entered using Statistical Package for Social Sciences (SPSS) version 21 (IBM).
- Descriptive statistics like mean, median, standard deviation and percentage were used.
- Chi-square test and fisher exact test were used to find the significance between the proportions.
- $P < 0.05$ was considered as statistically significant.

Informed consent:

Informed written consent and/or assent were taken from all the participants. Privacy and confidentiality was maintained in all cases by coding the patient.

Ethical issues:

The study was carried out after obtaining approval from the Research Ethics Board, Regional Institute of Medical Science, Imphal.

V. Results and Observation

A cohort study was conducted in the Department of General Surgery, Regional Institute of Medical Sciences, Imphal, Manipur for a period of 2 years from September 2015 to August 2017 among 61 post laparoscopic cholecystectomy patients to assess the incidence of postcholecystectomy syndrome after laparoscopic cholecystectomy for symptomatic gallstone disease and to analyse the group of patients who have higher incidence of postcholecystectomy syndrome after laparoscopic cholecystectomy for symptomatic gallstone disease.

Since the follow up time was less i.e. up to 3 months only, so there was no attrition. Data were checked for consistency and completeness. Data were entered using Statistical Package for Social Sciences (SPSS) version 21 (IBM). Descriptive statistics like mean, median, standard deviation and percentage were used. Chi-square test was used to find the significance between the proportions. $P < 0.05$ was considered as statistically significant.

Table 2: Age wise distribution of respondents.

Age in years	Number	Percentage
15-24	5	8.2
25-34	11	19.7
35-44	29	47.5
45-55	12	18.0
>55	4	6.6
Total	61	100.0
Mean ± SD	38.96 ± 7.24	

In table 2, age of the patients has been presented in number, percentage and mean.

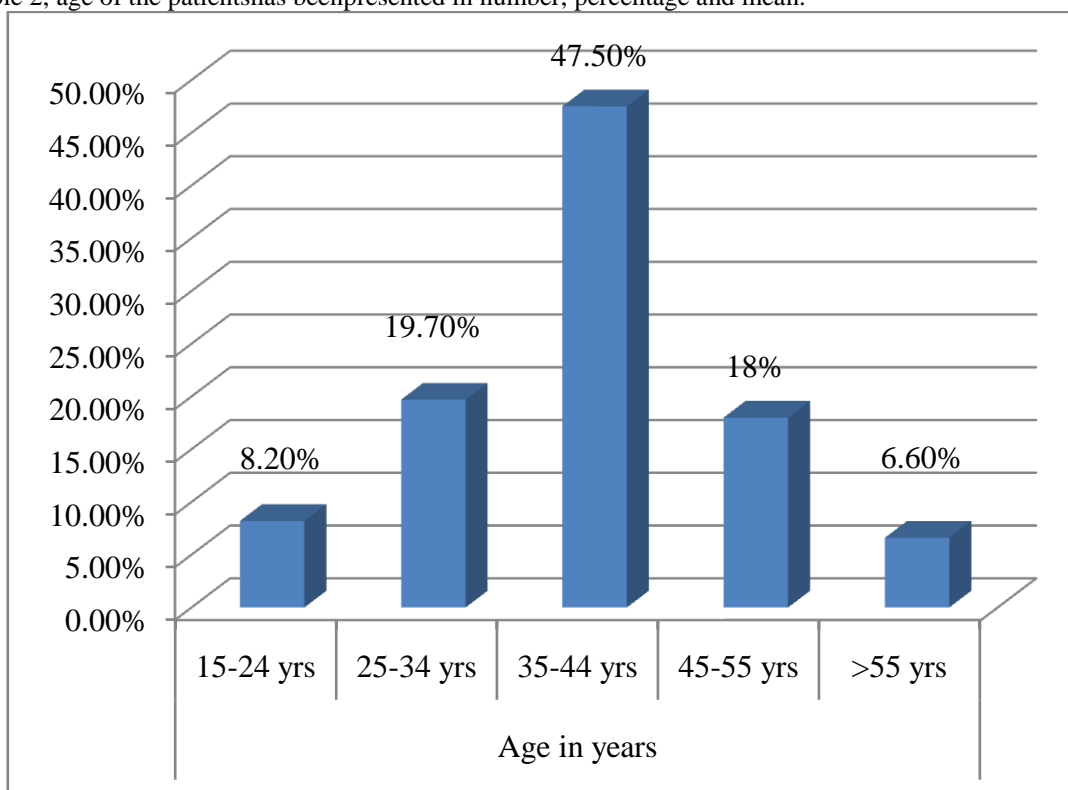


Figure 1: Bar diagram showing age wise distribution of respondents.

Majority of the patients were from the age group 35-44 years which accounted for 47.5% followed by 25-34 years (19.7%), 45-55 years (18.05) and 15-24 (8.2%) of the cases. Age group above 55 years accounted for only 6.6% of the cases. Mean age was 38.9 years with a standard deviation of 7.2 years.

Table 3: Distribution of respondents by sex.

Sex	Number	Percentage
Female	52	85.2
Male	9	14.8
Total	61	100.0

In table 3, sex of the patients has been presented in number and percentage.

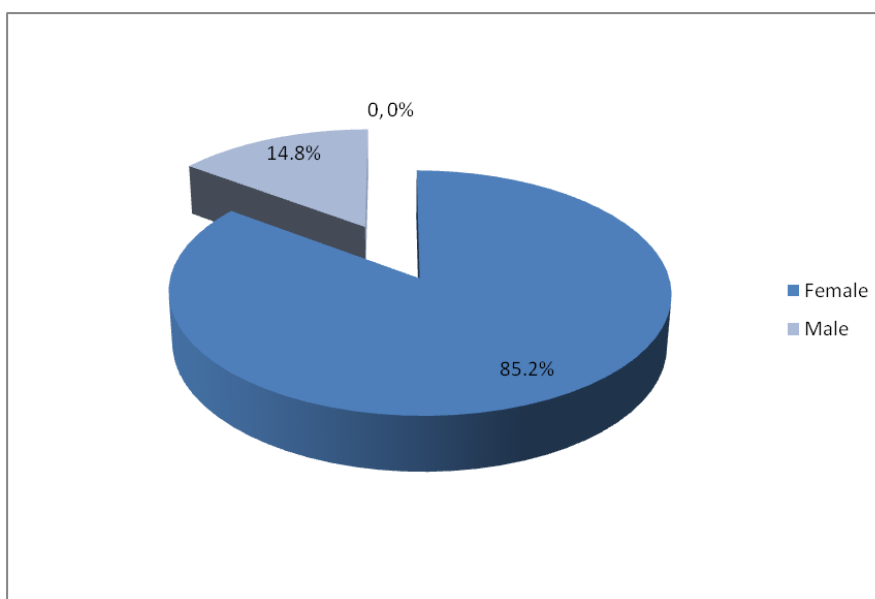


Figure 2: Pie chart showing distribution of respondents by sex.

Maximum number of the patients was females (85.2%) of the cases and males were 14.8% as shown in table 3 and figure 2.

Table 4: Distribution of respondents by religion.

Religion	Number	Percentage
Hindu	35	57.4
Christian	16	26.2
Muslim	10	16.4
Total	61	100.0

In table 4, religion of the patients has been presented in number and percentage.

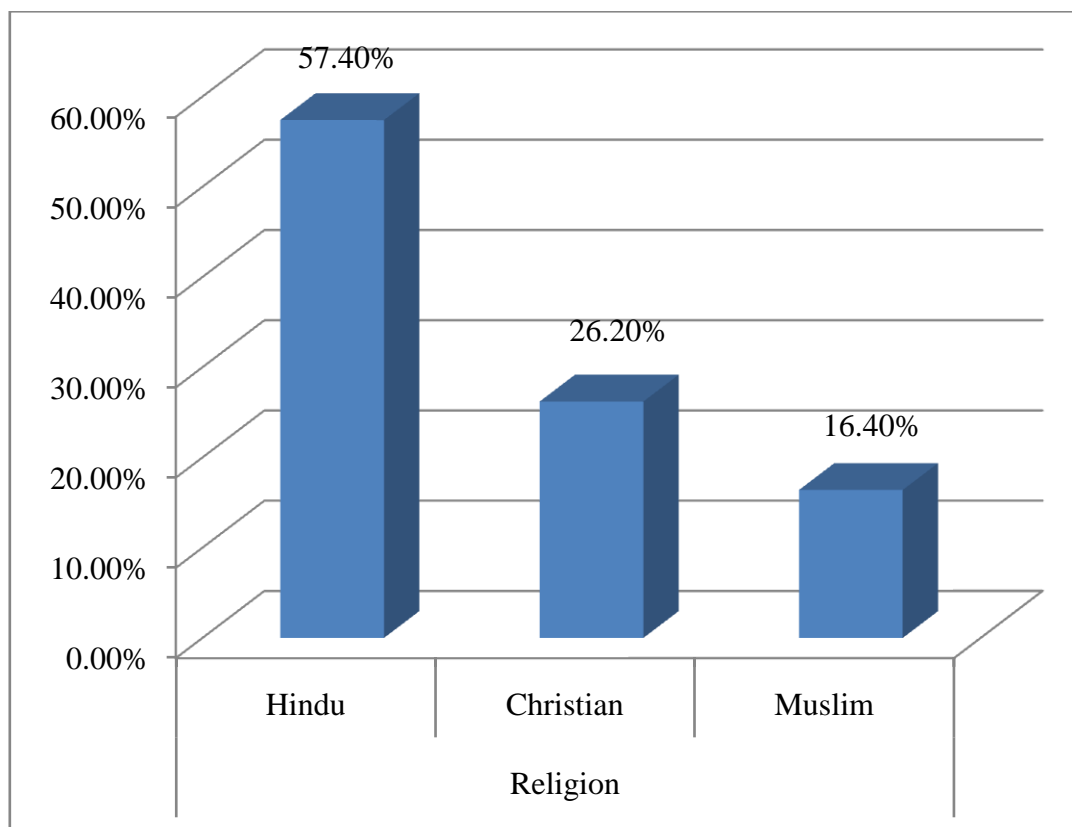


Figure 3: Bar diagram showing distribution of respondents by religion.

More than half of the patients were Hindus (57.4%) followed by Christians (26.2%) and Muslims (16.4%) as shown in table 4 and figure 3.

Table 5: Distribution of respondents by address.

Address	Number	Percentage
Urban	43	70.5
Rural	18	29.5
Total	61	100.0

In table 5, address of the patients has been presented in number and percentage.

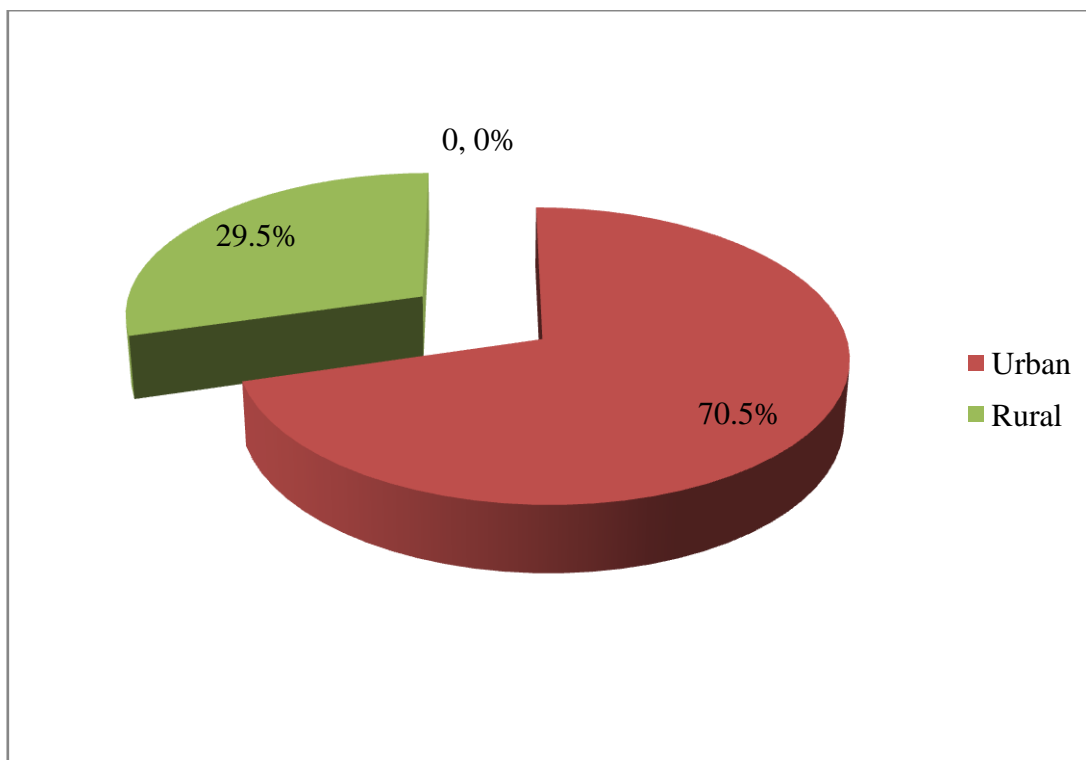


Figure4: Pie chart showing distribution of respondents by address.

Maximum of the patients were from urban areas (70.5%) followed by rural (29.5%) as shown in table 5 and figure 4.

Table 6: Distribution of respondents by Income.

Income	Number	Percentage
<10,000 (low)	11	18.0
10,000-15,000 (middle)	31	50.8
>15,000 (high)	19	31.2
Total	61	100.0

In table 6, income of the patients has been presented in number and percentage.

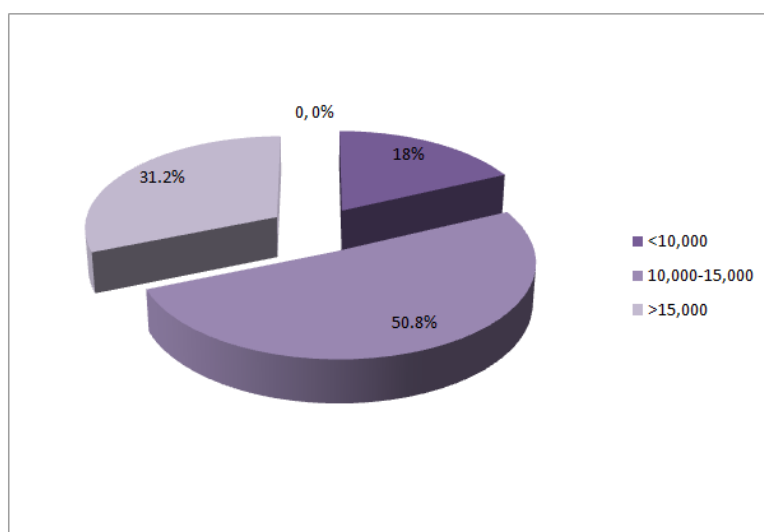


Figure5: Pie chart showing distribution of respondents by income.

Half of the patients were from middle income group (50.8%) of patients followed by high income group (31.2%) and low income group (18.0%) as shown in table 6 and figure 5.

Table 7: Distribution of respondents by type of activity.

Type of activity (based on occupation)	Number	Percentage
Sedentary	39	63.9
Non sedentary	22	36.1
Total	61	100.0

In table 7, patients by type of activity are presented in number and percentage.

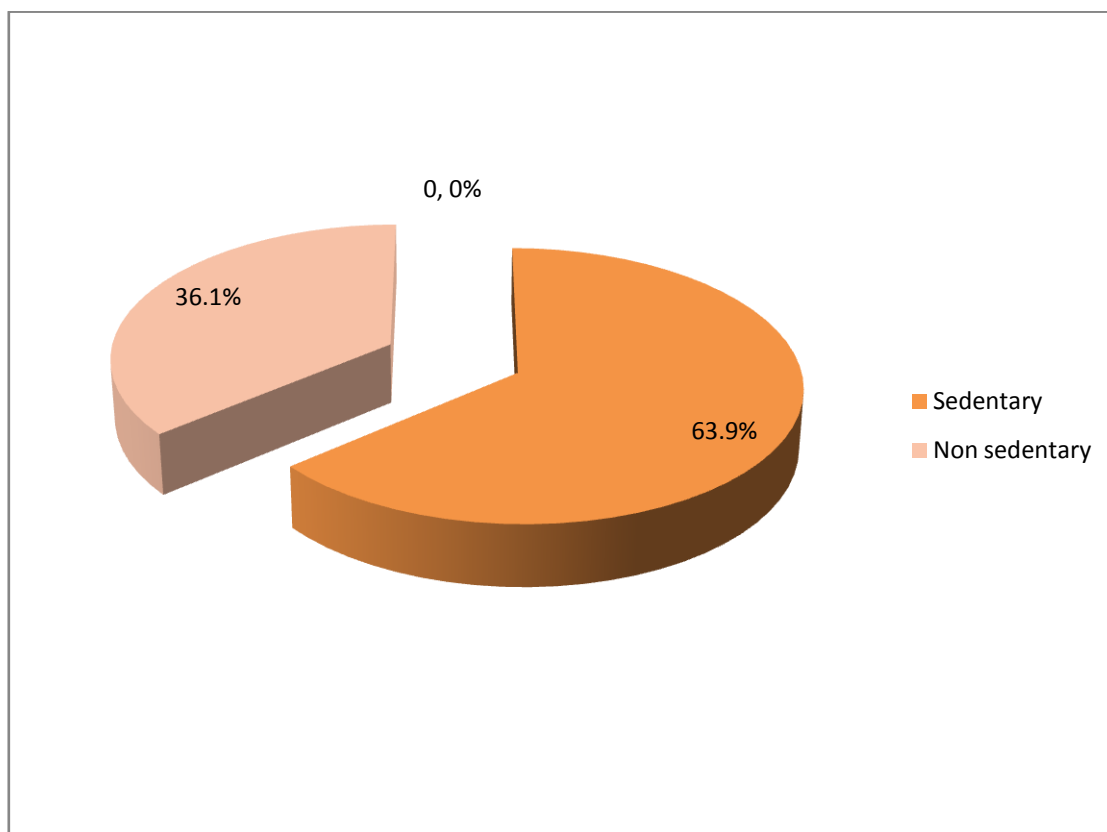


Figure 6: Pie chart showing distribution of respondents by type of activity.

More than half of the patients had sedentary life style (63.9%) of patients as shown in table 7 and figure 6.

Table 8: Distribution of respondents by duration of hospital stay.

Duration of hospital stay in days	Number	Percentage
Upto 2	21	34.4
3-5	34	55.7
>5	6	9.9
Total	61	100.0

In table 8, patients by duration of hospital stay are presented in number and percentage.

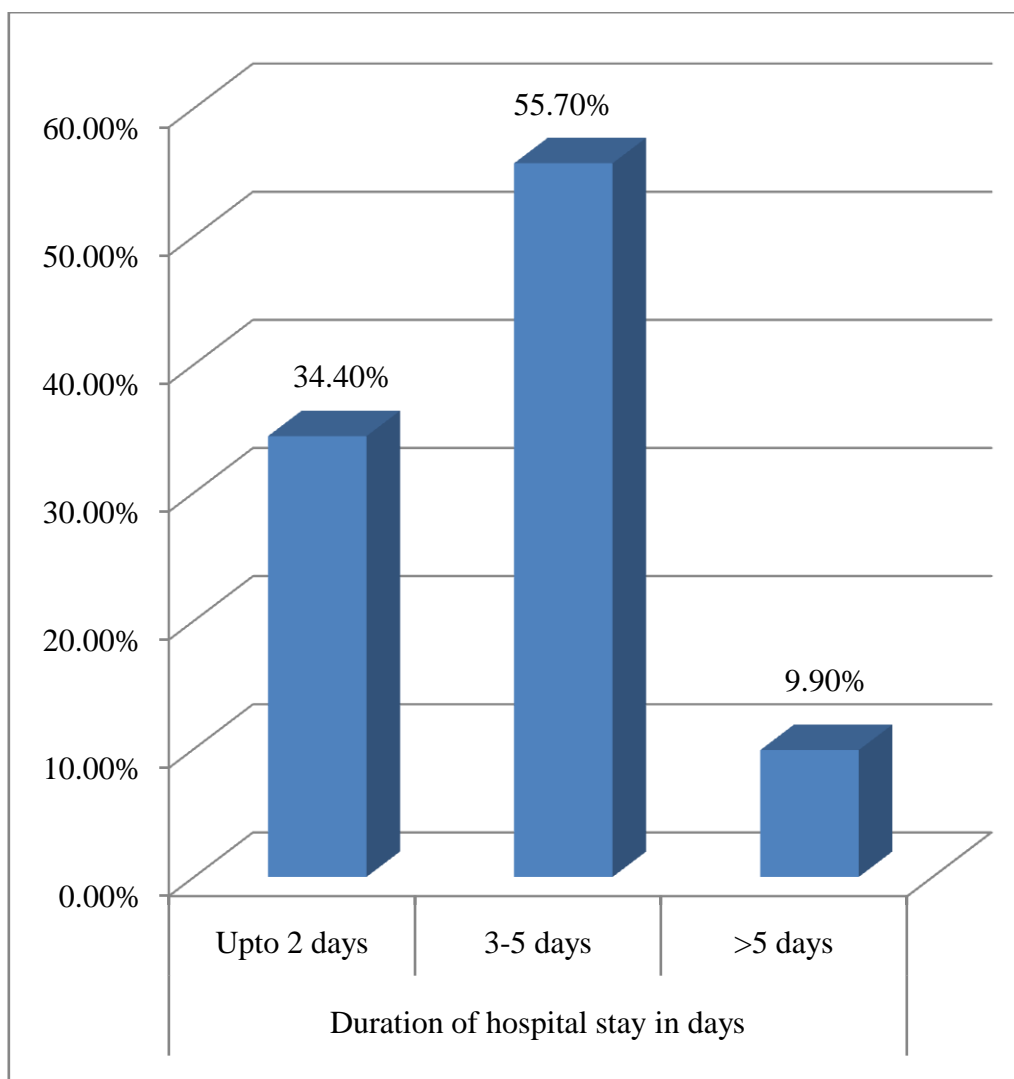


Figure7: Bar diagram showing of hospital stay.

57% of the patients stayed for 3-5 days followed by up to 2 days (34.4%) and some patients stayed for more than 5 days (9.9%) as shown in table 8 and figure 7.

Table 9: Distribution of respondents by presenting complains and signs.

Symptoms	Number	Percentage
Pain right hypochondrium	55	90.1
Abdominal discomfort	50	81.9
Fatty food intolerance	40	65.5
Flatulent dyspepsia	32	52.4
Vomiting	31	50.8
Pain in epigastrium	25	40.9
Nausea	17	27.8
Diarrhoea	9	14.7
Jaundice	4	6.5
Physical signs		
Murphy's positive	51	83.6
Palpable mass	6	9.9
Severe tenderness right hypochondrium	4	6.5

In table 9, patient's preoperative symptoms and signs are presented in number and percentage.

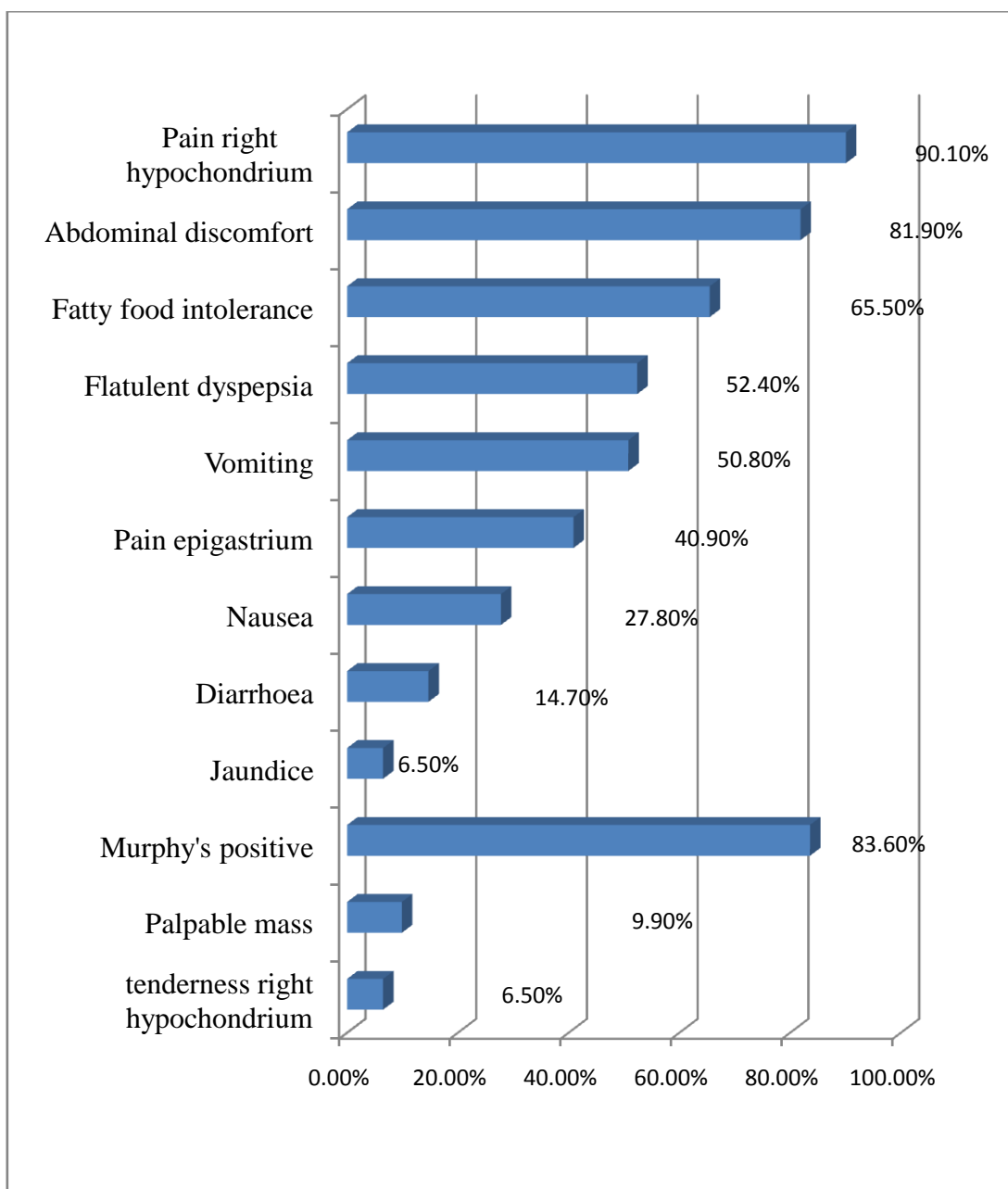


Figure8: Horizontal bar diagram showing distribution of respondents by presenting complains and signs.

Pain in the right hypochondrium was the main presenting complains followed by abdominal discomfort, fatty food intolerance, flatulent dyspepsia and vomiting in this study. Some patients were having more than one symptom.

Table 10: Distribution of respondents by symptoms after 2 weeks, one month and 3 months postoperatively.

Symptoms	Preoperative (%)	2weeks (%)	1 month (%)	3 months (%)	De novo
Pain in right hypochondrium	55 (90.2)	17 (27.8)	3 (4.9)	2 (3.2)	0 (0.0)
Abdominal discomfort	50 (81.9)	16 (26.2)	9 (14.7)	8 (13.1)	1 (1.6)
Fatty food intolerance	40 (65.5)	16 (26.2)	10 (16.3)	8 (13.1)	3 (4.9)
Flatulent dyspepsia	32 (52.4)	15 (24.5)	12 (19.6)	12 (19.6)	5 (8.2)
Eructation	25 (40.9)	10 (16.3)	5 (8.2)	3 (4.9)	1 (1.6)
Diarrhoea	9 (14.7)	4 (6.5)	2 (3.2)	1 (1.6)	1 (1.6)
Jaundice	4 (6.5)	1 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)

The incidence of postcholecystectomy syndrome after laparoscopic cholecystectomy for symptomatic gallstone disease in this study was in 13 cases (21.3%).

Two weeks into follow up, pain abdomen was still persistent in 27% cases. Abdominal discomfort and fatty intolerance was persistent in 26.2% of the cases. Flatulent dyspepsia was persistent in 24.5% of the cases, eructation and diarrhoea in 16.3% and 6.5% cases respectively. Jaundice was present in 1.6% of the patients.

After one month, percentage of pain in the right hypochondriun was drastically reduced to 4.9%. But abdominal discomfort was still 14.7%. Flatulent dyspepsia and fatty food intolerance was persistent in upto 19.3% and 16.3% cases. Diarrhoea was present in 3.2% cases and no jaundice was reported.

After 3 months pain in the right abdomen was still present in 3.2% of the cases. Flatulent dyspepsia, abdominal discomfort and fatty food intolerance was still persistent in large number of patients even after 3 months of follow up. Diarrhoea was present in 1.6% of the cases after 3 months post operative and no jaundice cases was found.

Flatulent dyspepsia was the most common symptom arising de novo (8.2%), followed by fatty food intolerance (4.9%), abdominal discomfort (1.6%), eructation (1.6%) and diarrhoea (1.6%).

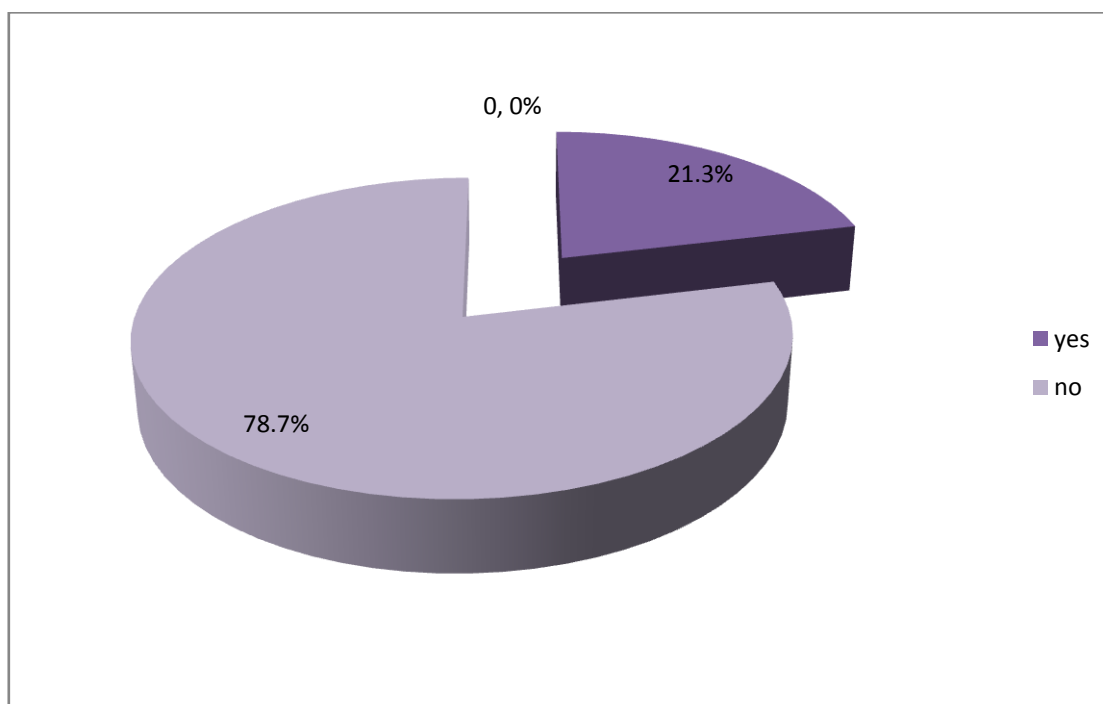


Figure9: Pie chart showing distribution of respondents by incidence of postcholecystectomy syndrome.

Total 13 cases or 21.3% of patients were having persistence of symptom. So, total 78.3% of patients were not having persistent symptoms or postcholecystectomy syndrome as shown in figure- 9.

Analysis of signs and symptoms

1. Right upper quadrant pain:

90.2% symptomatic patients had right upper quadrant pain preoperatively. At 2 weeks, 1 month, 3 months and de novo pain were 27.80%, 4.90%, 3.20%, nil respectively.

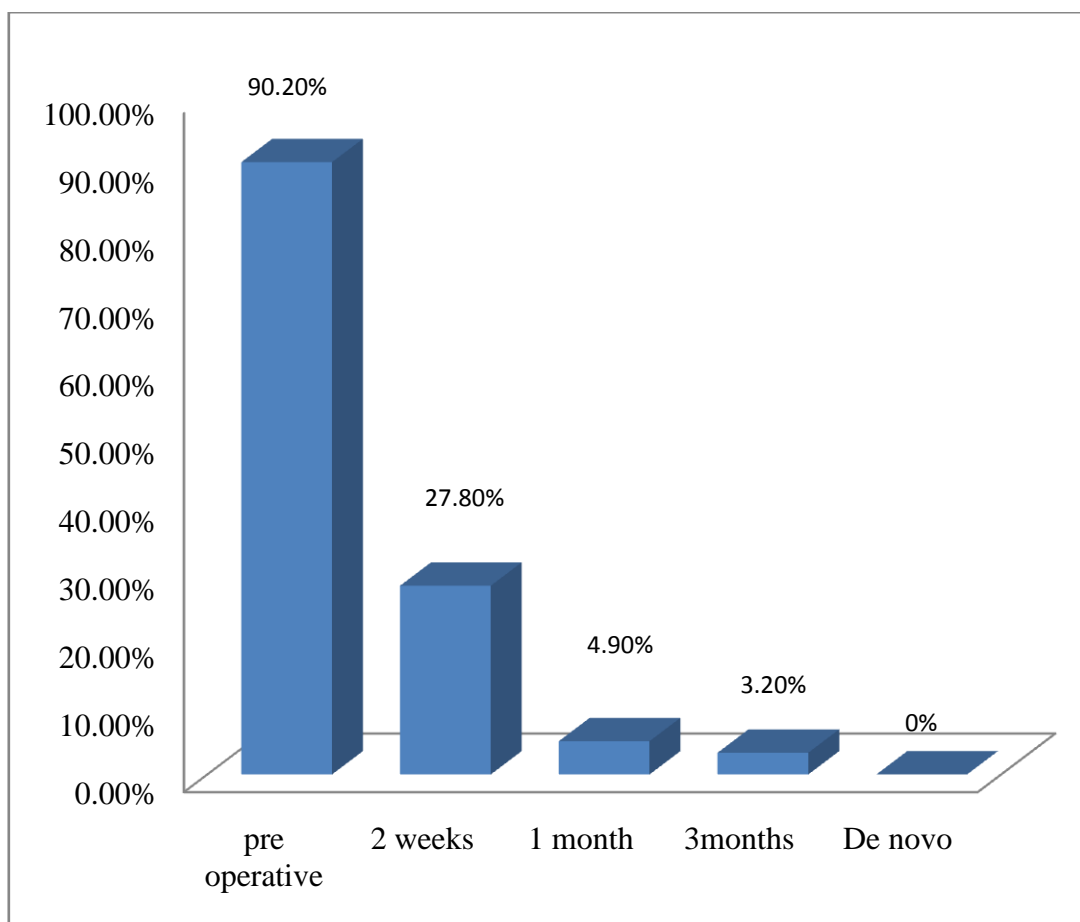


Figure10: Bar diagram showing distribution of respondents by post operative pain in right hypochondrium.

2. Abdominal discomfort:

Abdominal discomfort in symptomatic patients at 2 weeks, 1 month, 3 months, and de novo were 26.2 %, 14.70%, 13.10 % and 1.60% respectively.

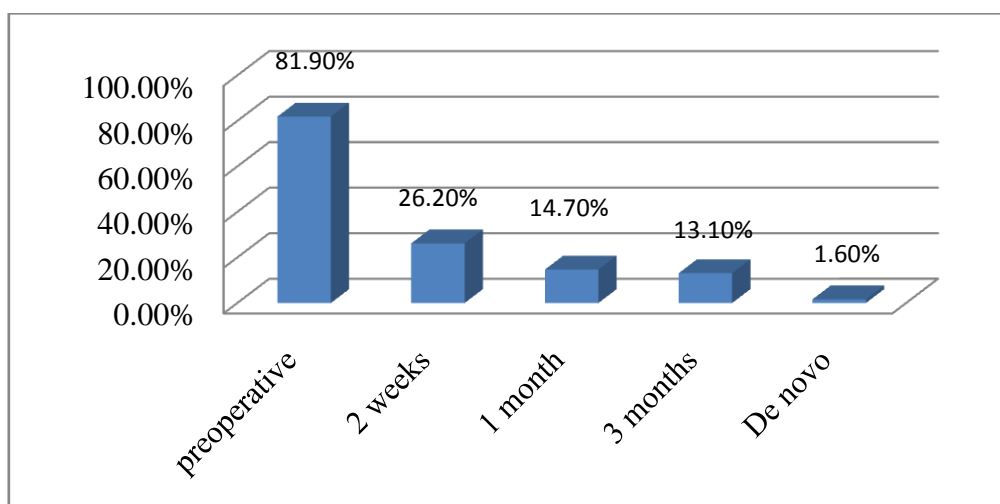


Figure11: Bar diagram showing distribution of respondents by post operative abdominal discomfort

3. Fatty food intolerance;

This symptom was persistent even after 3 months. At 3 months, it was 13.10% and de novo was 4.90% of symptomatic cases.

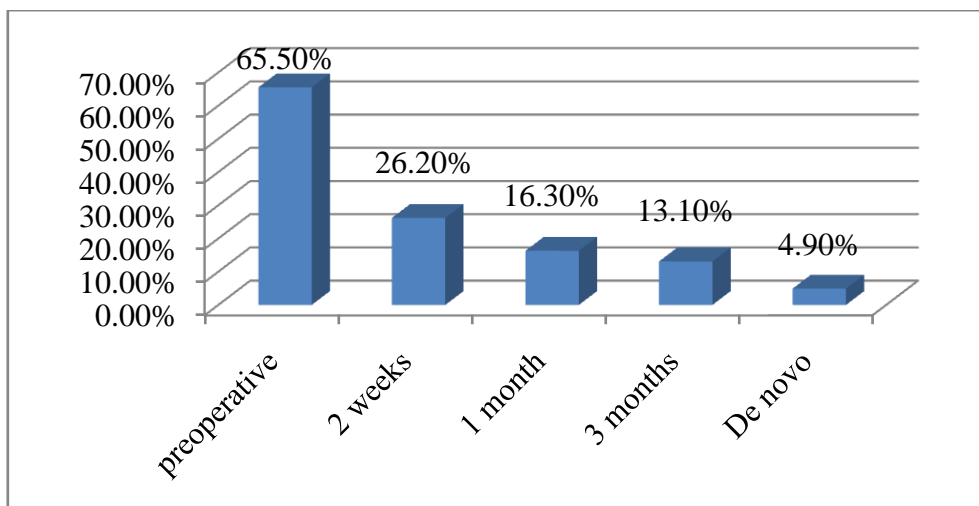


Figure12: Bar diagram showing distribution of respondents by post operative fatty food intolerance

4. Flatulent dyspepsia:

Flatulent dyspepsia had higher incidence among symptoms. It was 19.60% at 3 months and de novo 8.20% of symptomatic cases. So it was the most persistent symptom among all.

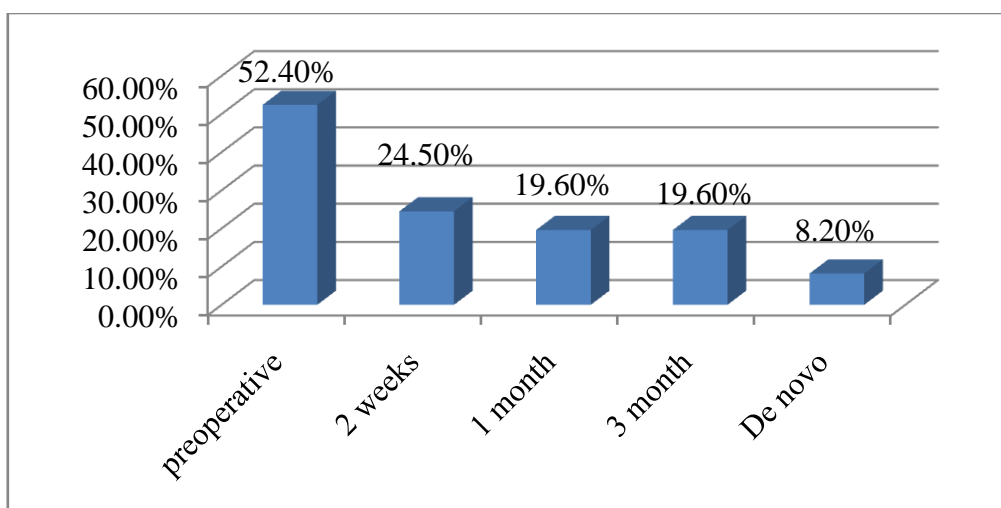


Figure13: Bar diagram showing distribution of respondents by post operative flatulent dyspepsia

5. Eructation:

Eructation was drastically reduced postoperatively. At 3 months it was 4.90% of symptomatic cases.

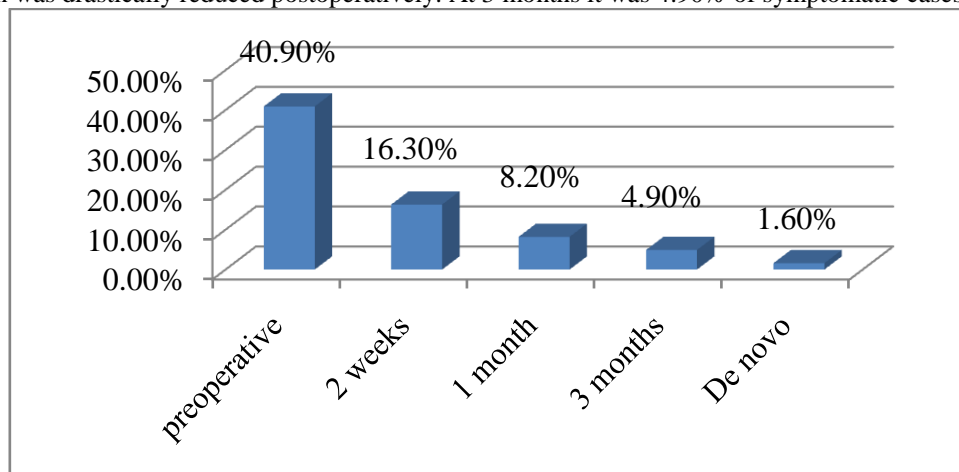


Figure14: Bar diagram showing distribution of respondents by post operative Eructation

6. Diarrhoea:

It was significantly reduced postoperatively. At 3 months it was 1.60% and de novo was 1.60% of symptomatic cases.

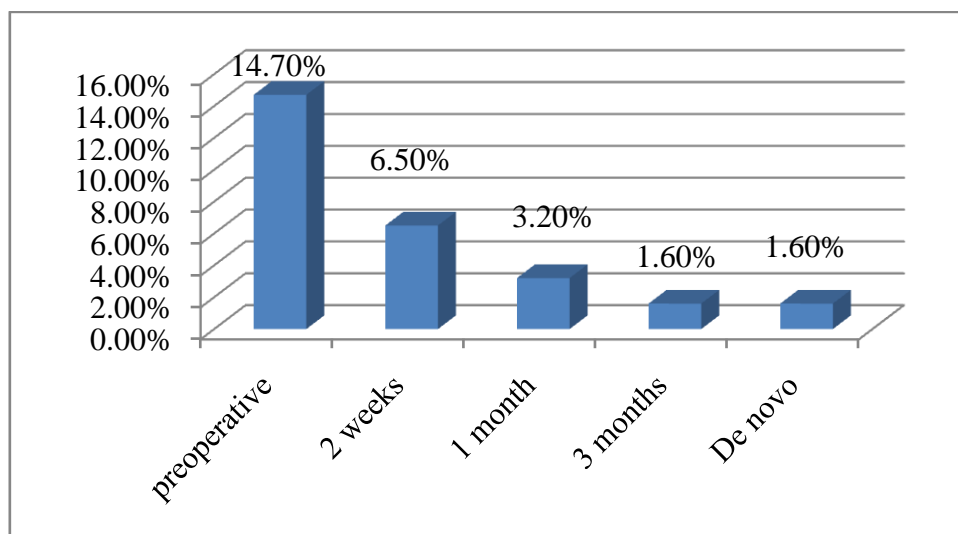


Figure15: Bar diagram showing distribution of respondents by post operative diarrhoea.

7. Jaundice:

Jaundice cases were not present postoperatively at 3 month and 1 months and de novo was also nil. Though at 1 month it was 1.60%.

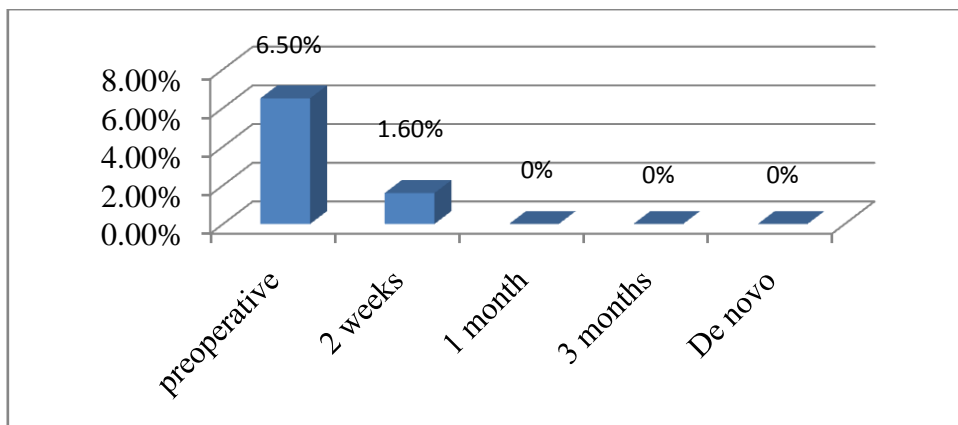


Figure16: Bar diagram showing distribution of respondents by post operative Jaundice.
Analysis of PCS in different group

Table 11: Relation between patients with persistent symptoms (PCS) and no symptoms with age.

Age in years	PCS	No PCS	Total (%)	Chi-square test
15-24*	0 (0.0)	5 (100.0)	5 (100.0)	Value=0.199 p-0.905
25-34*	3 (27.2)	8 (72.8)	11 (100.0)	
35-44	6 (20.6)	23 (79.4)	29 (100.0)	
45-55*	3 (25.0)	9 (75.0)	12 (100.0)	
>55*	1 (25.0)	3 (75.0)	4 (100.0)	
Total	13 (21.3)	48 (78.7)	61 (100.0)	

Here in 25-34 years age group total cases of PCS were 3. But the percentage of PCS among this age group was 27.2%. Followed by 45-55 years and >55 years age group (25%). Highest cases were among the age group of 35-44 years (6 cases). But the percentage of PCS was 20.6%. So the higher incidence of PCS was among age group 25-34 years followed by >45 years. But the difference were statistically not significant (p-0.905). Figure 17 is showing distribution of respondents by relation between age and PCS.

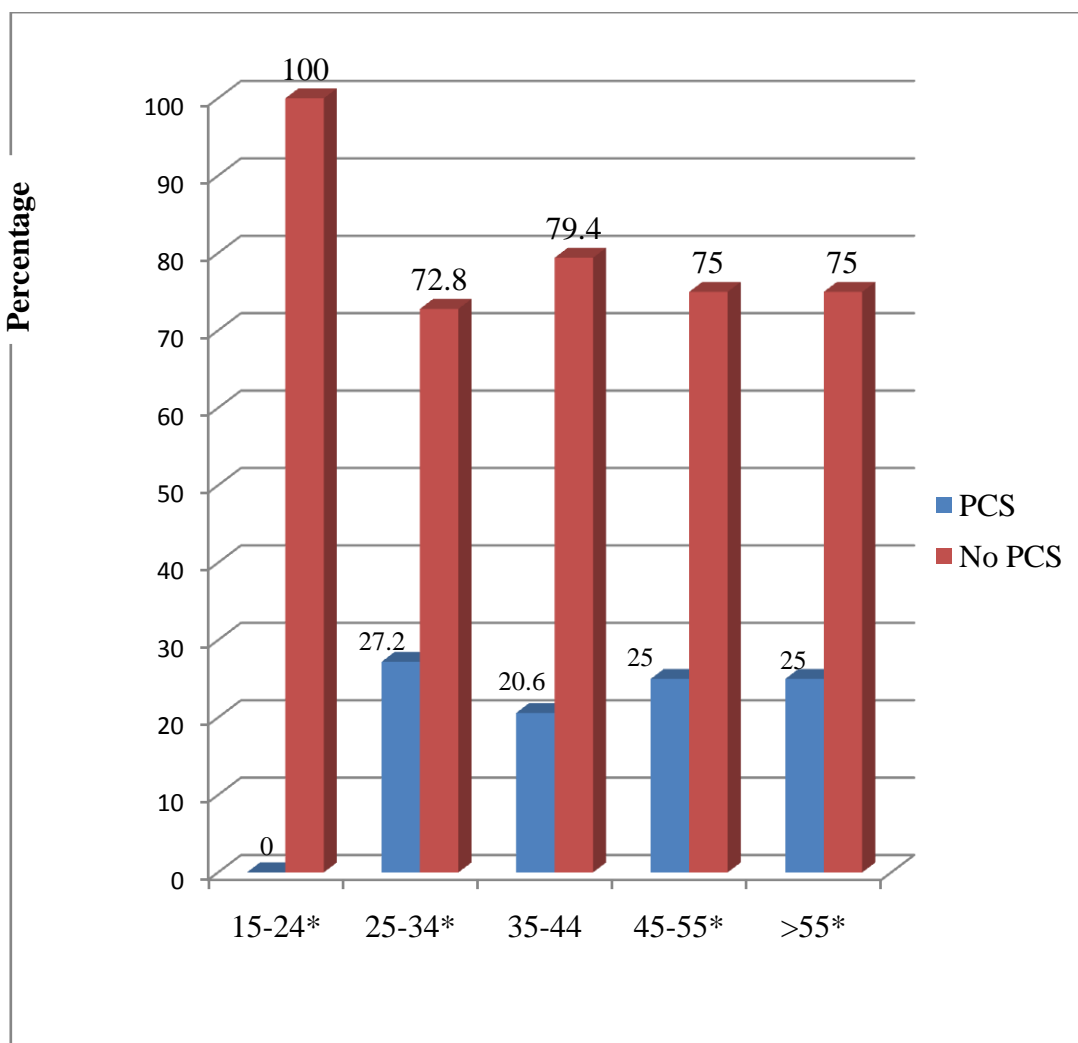


Figure17: Bar diagram showing distribution of respondents by relation between age and PCS.

Table 12: Relation between patients with persistent symptoms (PCS) and no symptoms with sex.

Sex	PCS (%)	No PCS (%)	Total (%)	Fisher exact test
Female	11 (21.1)	41 (78.9)	52 (100.0)	Value=0.005 df-1 p-0.94
Male	2 (22.2)	7 (77.8)	9 (100.0)	
Total	13 (21.3)	48 (78.7)	61 (100.0)	

Here, in female incidence of PCS was 21.1% and total cases were 11. And in male total cases of PCS was very less (2 cases). But the incidence of PCS percentage was 22.2%. Percentage of both groups was almost equal. So, similar finding was observed in between the two groups and was no statistical difference (p-0.94).

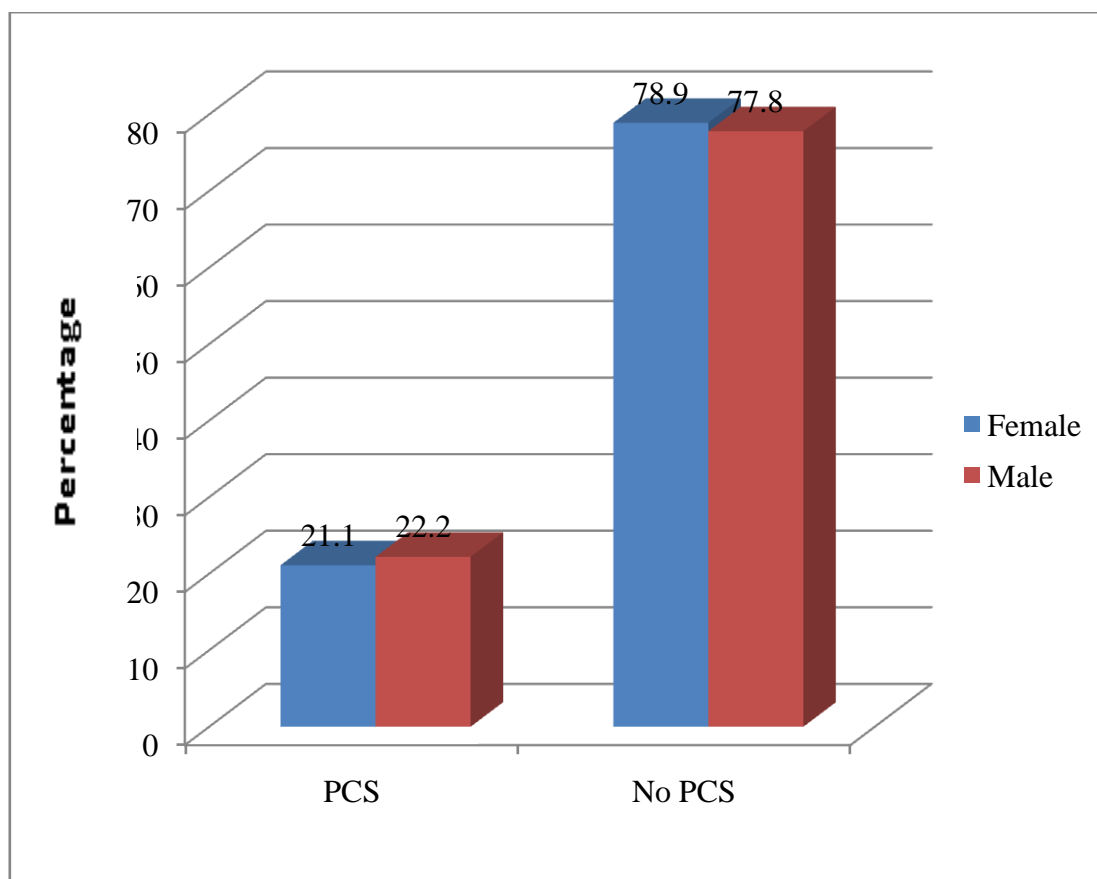


Figure18: Bar diagram showing distribution of respondents by relation between sex and PCS

VI. Discussion

A cohort study was conducted in the Department of General Surgery, Regional Institute of Medical Sciences, Imphal, Manipur for a period of 2 years from September 2015 to August 2017 among 61 cases of postlaparoscopic cholecystectomy patients to assess the incidence of postcholecystectomy syndrome after laparoscopic cholecystectomy for symptomatic gallstone disease and to analyse the group of patients who have higher incidence of postcholecystectomy syndrome after laparoscopic cholecystectomy for symptomatic gallstone disease.

Since the follow up time was less (3 months only) there was no attrition. Data were checked for consistency and completeness. Data were entered using Statistical Package for Social Sciences (SPSS) version 21 (IBM). Descriptive statistics like mean, median, standard deviation and percentage were used. Chi-square test was used to find the significance between the proportions. $P < 0.05$ was considered as statistically significant.

In this study, mean age was 38.9 years with a standard deviation of 7.2 years. Majority of the patients were from the age group 35-44 years which was similar to the study by Muqim R et al⁴⁹ where age group 21-40 years contributed 56.7% of cases.

Maximum of the patients were female which accounted for 85.2% of cases. This finding was in accordance with the study by Lumen W et al¹⁰ where female predominance was 80%. Similar finding was observed in the study by Weinert et al³⁷ where female constituted 77.8% of the patients. Similar finding was observed in the study by Muqim R et al⁴⁹ where females were 89.46%.

In this study most of the patients were Hindu by religion. (57.4%). This could be because of the demographic composition of Manipur, the place of this study, which has a majority Hindu population.

Most of the patients were from urban areas (70.5%) of cases and who had sedentary life style (63.9%). Similar findings were observed in the study by Schmidt M et al³³ where most of the patients were from urban area (69.5%) and who had sedentary life style.

Half of the patients were from middle income group followed by high income group. Duration of hospital stay of more than half of the patients was of 3-5 days (55.7%).

Pain in the right hypochondrium was the main presenting complain (90.1%) followed by abdominal discomfort (81.9%), fatty intolerance (65.5%), flatulent dyspepsia (52.4%) and jaundice (6.5%) in this study.

Similar findings were also observed in the study by Lamberts MP et al⁵⁰ where pain in the upper abdomen was the main presenting complain of cholecystectomy.

Post operative persistence or incidence of post cholecystectomy syndrome was 21.3% in this study. So, 79.7 % of patients were apparently relieved of symptoms by the end of the study. There has been few studies which have examined symptoms after laparoscopic cholecystectomy. In a three month follow up of 52 patients, Peters et al⁵¹ reported that 77% of patients considered their symptoms to have been cured by the procedure which was similar to this study (79.7%). Qureshi et al⁴⁴ analysed patients' perceptions of postoperative symptoms and global satisfaction. They noted that 25% of patients complained of more than two symptoms postoperatively. This was almost similar to the incidence of this study (21.3%). In the study by Kim GH et al³⁶ and Konsten et al⁴⁵ symptoms were reported in 18% and 19% of the cases respectively.

Higher incidence was found in the study by Carney et al⁵² (29%) where the study was of paediatric population. But in the present study paediatric population were included as the lower age group was 15 years. Here, in 25-34 years age group, total no of PCS cases was 3. But the percentage of PCS among this age group was 27.2%, followed by 45-55 years and >55 years age group which was 25%. Though highest cases were among the age group of 35-44 years (6 cases), but the percentage of PCS was 20.6%. So the higher incidence of PCS was among age group 25-34 years followed by >45 years age group. But the differences were statistically not significant (p=0.905).

Lesser incidence of PCS (10%) was found in some studies. Wilson et al²⁸ evaluated symptomatic outcome of 115 patients a year after laparoscopic cholecystectomy and compared the outcome with 200 patients who had undergone the open procedure. Over 90% of patients in both groups considered the procedures to have been successful in achieving symptomatic relief. The reason might be long follow up of one year where symptoms of patients faded with time, while this study had only 3 months follow up. The study by Mertens et al¹¹, Ros et al²⁴ and McMahon et al⁸ also reported that over 90% of patient's symptoms improved by the operation.

Among them the most common persistent or incident symptom was flatulent dyspepsia in 92.3% of the cases. This was followed by abdominal discomfort and fatty intolerance in 61.5% of the cases. This study confirmed that these symptoms are not alleviated by the operation. These findings were consistent with the study by Luman et al¹⁰ and Kjeligren K et al⁴². There might be reasons for this persistence of symptoms which is beyond the scope of this study. These results were consistent with the previous findings by Ros E et al²⁴, Walsh TN et al⁵³, Jones RH et al⁵⁴ and Stefanni et al⁵⁵, that a large percentage of patients with gall stone disease have functional motility disturbances of the gastrointestinal tract, the symptoms of which were not changed by cholecystectomy. One previous study by Ros E et al²⁴ showed that socio psychological factors seem to play an important part in the development of postcholecystectomy dyspepsia.

Pain in the right hypochondrium was incident in 15.4% of cases and diarrhoea in 7.6% of cases. Post cholecystectomy diarrhoea was reported by 11% of the patients in the study conducted by Hasan R et al⁵⁶. A similar incidence has been reported previously by Soper NJ et al⁶. Another study by Peter JH et al⁵¹ evaluated that loose stools, with relapsing bouts of more abundant watery diarrhoea after removal of the gall bladder can be explained by postoperative disturbance of bile metabolism and changes in the dynamics of bile release resulting in subclinical fat malabsorption⁵¹. Study by Vender GC³² reported that postcholecystectomy diarrhoea was the main complain after cholecystectomy (18%), which was against the findings of this study.

No incident case of jaundice was reported at 3 months of follow up. This finding was consistent with the study by Hasan et al⁵⁶ where jaundice after cholecystectomy was not encountered. However, Soper NJ et al⁶ and Henry NC et al²⁷ revealed that an incidence of retained or missed common bile duct stones of 1% or less may sometime cause jaundice.

In this study sex had no relation with the post cholecystectomy syndrome. Sex is no predictor of post-operative outcome which was found in the study by Mertens et al¹¹.

VII. Conclusion

The present cohort study of 61 cases was conducted to assess postcholecystectomy syndrome among post laparoscopic patients attending hospital for follow up. The age group most commonly affected by cholelithiasis was of 35- 44 years, with mean age of 38.9 years, most commonly in female and urban population. Most of the patients were from middle income group and had sedentary life style.

The incidence of postcholecystectomy syndrome was 21.3%. The incidence of postcholecystectomy syndrome was highest in 25-34 year age group and followed by >45 years age group. In this study sex had no relation with the postcholecystectomy syndrome.

In this study, post operative cholecystectomy symptoms were found in almost one half of the patients. The most common persistent symptom was flatulent dyspepsia. Other persistent symptoms like abdominal discomfort and fatty intolerance were also prevalent but no jaundice was seen. Further studies with larger sample size and robust methods are recommended.

VIII. Summary

Postcholecystectomy syndrome after laparoscopic cholecystectomy is a matter of concern as it affects the long-term postoperative outcome of the patients leading to abdominal discomfort, abdominal pain, flatulence, dyspepsia, diarrhoea and fatty food intolerance.

This study was conducted to assess postcholecystectomy syndrome among post laparoscopic cholecystectomy patients attending hospital for follow up. Total 61 cases were included in the study who fulfilled the inclusion and exclusion criteria.

It was a cohort study with consecutive sampling. The duration of study was two calendar years from September 2015 to August 2017. It was carried out after obtaining approval from the Research Ethics Board, Regional Institute of Medical Science, Imphal. Written consent was taken from the participants and confidentiality was maintained.

The patients were subjected to detailed clinical examination, all relevant investigation was done and post operative detailed interview were worked up. Data were entered using Statistical Package for Social Sciences (SPSS) version 21 (IBM) and analyzed using mean, median, standard deviation and percentage. Chi-square test was used to find the significance between the proportions.

In this study mean age was 38.9 years and majority of the patients were females. Most of the patients presented with pain in the right hypochondrium. Other symptoms were abdominal discomfort, fatty intolerance, flatulent dyspepsia and jaundice.

Post operative persistence symptoms or incidence of post cholecystectomy syndrome was 21.3% in this study. Among them the most common persistent or incident symptom was flatulent dyspepsia. It was 24.5%, 19.6% and 19.60% in 2 weeks, 1 month, and 3 months respectively. Symptoms like abdominal discomfort and fatty intolerance were persistent after operation. Fatty food intolerance was the second most common symptom. It was 26.2%, 16.3%, 13.1% in 2 weeks, 1 month, 3 months respectively including de novo was 4.9%.

Jaundice was found in 1.6% of the patients after the operation at 2 weeks follow up. But it was not found in subsequent follow up at 1 month and 3 months. Some cases of pain in the right hypochondrium was persistent even after the operation. Most patients were having more than one symptom.

In this study higher incidence of postcholecystectomy syndrome was among the age group of 25-34 years (27.2%). Followed by 45-55 years and >55 years age group, both of which were 25% respectively. But the differences were not statistically significant ($p < 0.905$).

Incidence of postcholecystectomy syndrome in males was 22.2% and in females 21.1%. Similar incidence was observed in between the two groups and was no statistical difference ($p = 0.94$).

This study determined that postcholecystectomy syndrome is a significant morbidity after laparoscopic cholecystectomy. While most symptoms improve, a significant number of pain and nonpain symptoms persist even after laparoscopic cholecystectomy. With these data, surgeons can modulate postoperative expectations and advise on the possible persistence of symptoms. All patients should be preoperatively counselled about the risk of persistence of some pain/non-pain symptoms or postcholecystectomy syndrome after laparoscopic cholecystectomy.

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