A DIFFERENTIAL DIAGNOSIS AND MANAGEMENT OF CHOLELITHIASIS IN TERTIARY CARE HOSPITAL

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Abstract-
BACKGROUND: The gallbladder is a small organ located just beneath the liver. The gallbladder holds a digestive fluid known as bile that is released into your small intestine. Cholelithiasis or gallstone are hardened deposits of digestive fluid that can form in your gallbladder. Cholelithiasis is one of the commonly occurring disease which we are observing in many people. In this modern generation most of the individuals have different life styles, diet, social habits to which people are addicted. Our study helps to identify risk factors like any social habits such as alcohol, smoking, tobacco, any drug addiction, diet (fatty foods), obesity, any comorbidities such as Hypertension, Diabetes Mellitus, Thyroid illness, IHD etc.

OBJECTIVES: This study aims to determine the various to determine treatment options for cholelithiasis, among the patients who received etiologies of potential cholelithiasis, including physical exam findings, lab analysis, diagnostic imaging testing and pharmacological and non-pharmacological treatment through well-validated questionnaire.

MATERIALS AND METHODS: A prospective and retrospective observational study with sample size of 101 patients was conducted in tertiary care hospital outpatient department and medical record department. Statistical analysis was performed using MS-excel and the result was analyzed statistically using appropriate statistical method wherever necessary. The result was depicted by graphical representation using pie charts and bar graphs.

RESULTS: Out of 101 patients, ERCP was performed in 17.7% patients, CT scan of abdomen was performed in 10.4% patients, Biopsy of gall bladder was performed in 8.4%. MRI of abdomen was performed in 2.1% patients and CECT scan was performed in 1% of the patients. 80% of the patients were treated with the pharmacological therapy, 76% of the patients treated by means of surgery.

CONCLUSION: This study concluded the possible risk factors for causing cholelithiasis and commonly prescribed diagnosing methods such as USG of abdomen and pelvis, ERCP, CT and MRI scan of abdomen and determined the most preferred treatment option such as non-pharmacological treatment.

Index Terms: Cholelithiasis, gall stone disease, biliary colic, Murphy’s sign, Laparoscopic cholecystectomy, Peritoneal lavage.

INTRODUCTION:
The gallbladder is a small organ located on the right side of abdomen, just below the liver. The gallbladder contains a digestive fluid known as bile that is released into your small intestine. Bile get deposited and forms hardened crystals in gall bladder which is known as gallstone disease or cholelithiasis. Gallstones are small hardened stones formed from bile precipitates. These “stones” may be present in the gallbladder or ducts leading from the liver to the small intestine. There are two categories of gallstones: cholesterol and pigment stones. Both categories have their own distinctive epidemiology and risk factors. Cholesterol stones are yellow-green and are buildup of hardened cholesterol. These stones mostly found in women and obese people, are associated with bile concentrated with cholesterol. They result for 80% of choleliths and are more commonly associated in obstruction and inflammatory. Pigment stones likely to be blackor brown stones. Black pigment stones are generally composed of pure calcium bilirubinate or complexes of calcium, copper, and mucus glycoproteins. Brown pigment stones are made of calcium salts of unconjugated bilirubin with ample amounts of cholesterol and protein.
The pain is distinguished as periodic and severe epigastric pain. There is a sudden onset of pain. Elevated in intensity, and lasting from 15 minutes to several hours. Pain frequently accompanied by radiation to the interscapular region or the right shoulder often with vomiting and diaphoresis. Biliary colic persists with symptoms of nonspecific dyspepsia such as intolerance of fatty foods, heartburn, flatulence, aerophagia, sweating, yellowish colorof skin or sclera of the eye, and clay-colored stools are symptoms that suggest complications such as cholangitis and choledocholithiasis and required immediate medical attention. The interval between “attacks” is unforeseeable and may range from days to months or years.
The occurrence of gall stone disease increases with the age. Number of drugs have been involved in gallstone disease. The most common of them include clofibrate, oral contraceptives, estrogen replacement, progestogens, and octreotide and only few drugs are secreted into bile and may complex, precipitate, and form stones. Other compounds may develop gallbladder stasis with collateral increase in cholesterol secretion into bile.
The prevalence of gallstones is more in women than men. Studies have shown that gallstone disease is frequent in young women but rare in young men. However, the difference reduces with increasing age. It is assumed that the reason for this gender difference is hormonal. Serum estrogen increases (especially during pregnancy) elevate biliary cholesterol saturation and increased progesterone may result in inhibition of the contraction of the gall bladder[2]. The major risk factor of cholelithiasis is obesity. Women with overweight are more prone for gallstones and body mass index (BMI) range of those women is greater than 30kg/m². An individuals who undergo rapid weight loss on very low calorie diets are found to be having high risk of gallstone disease. Formation of gallstone is one of the most important complications of voluntary weight loss plans[3].

The diagnosis of gallstone disease is done by conducting physical exam, laboratory tests, radiological studies, ultrasonography, MRI and MRCP, Endoscopic diagnosis includes Endoscopic Retrograde Cholangiopancreatography (ERCP), Endoscopic ultrasonography (EUS)[2].

Laparoscopic Cholecystectomy is the principal procedure for the management of symptomatic gallstone disease. It has lesser risk of recurrence, and provides 92 percent of patients with complete relief of their biliary pain. Indications for cholecystectomy includes Biliary pain, Biliary dyskinesia, Calcified gallbladder, Acute cholecystitis, Cholelithiasis[3]. The management of cholelithiasis includes medical therapy and surgical therapy. Medical therapy: Oral dissolution therapy that obstruct the development of gallstones in the gallbladder. HMG CoA reductase inhibitors and Ursodeoxycholic acid both inhibit de-novo hepatic cholesterol synthesis. This causes the secretion of under saturated bile, ease stone dissolution. Nearly 15% of patients qualify, therapy takes at least 6–12 months, and choleliths recur in 50% of patients within 5 years[2].

Surgical therapy: Cholecystectomy is the only prominent treatment for symptomatic gallstones. In past, open Cholecystectomy was the standard surgical option for patients. Laparoscopic Cholecystectomy has been used instead of open procedure as the treatment option of choice in all but a few cases. Laparoscopic Cholecystectomy is a minutely invasive procedure in which the surgeon will make a few number of small incisions over the abdomen and employ small video camera to magnify the organs of the abdominal cavity. By the use of video monitor to guide his actions, the surgeon identifies, isolates, and detaches the gallbladder from its connections to the liver and bile ducts through the laparoscope. There is no large abdominal incision and also exhibit in less pain, shorter length of stay in hospital, and fewer. The most common complication in both procedure is injury to the common bile duct. These can be treated effectively by ERCP[2].

This present study aims to assess the possible risk factors for causing cholelithiasis and commonly prescribed diagnosing methods such as USG of abdomen and pelvis, ERCP, CT and MRI scan of abdomen and determined the most preferred treatment option such as non-pharmacological treatment.

MATERIALS AND METHODS

Study design, sample and study settings

A prospective and retrospective observational study to demonstrate the possible risk factors, diagnosis, and treatment options was conducted in tertiary care hospital i.e., Mallige hospital, Bengaluru, Karnataka. A sample size of 101 patients were made after fulfillment of inclusion and exclusion criteria for the study.

Inclusion and Exclusion criteria

The patients with symptomatic gallstone disease, ultrasonographic evidence of gallstones, Acute abdominal pain last for more than 8 to 12hr, Tenderness on clinical examination in the upper right quadrant, elevated temperature are considered as inclusion criteria. Exclusion criteria includes Age below 18 or above 85, Not willing to participate, Severe concomitant disease, Patients with psychiatric disorder.

Materials

Patient data collection form, patient informed consent form, prescription data, medication chart, investigational data, nursing notes and doctors notes and case reports from medical record department.

Methods

Mx-excel is used to interpret results and is represented by graphical methods; pie charts and bar graphs.

RESULTS

Demographic characteristics of study population

AGE

Patients whose cases were studied for this project belonged to age group between 18 – 85 years. Out of 101 patients, most of them were belonging to age group between 56-85 years old i.e., 43% (n=43).
Table 1: Age distribution of the patients

<table>
<thead>
<tr>
<th>AGE DISTRIBUTION</th>
<th>NUMBER OF PATIENTS</th>
<th>IN PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 – 35</td>
<td>14</td>
<td>13.86%</td>
</tr>
<tr>
<td>18 – 39</td>
<td>01</td>
<td>0.98%</td>
</tr>
<tr>
<td>36 – 55</td>
<td>36</td>
<td>5.6%</td>
</tr>
<tr>
<td>40 – 59</td>
<td>03</td>
<td>2.97%</td>
</tr>
<tr>
<td>60 – 79</td>
<td>04</td>
<td>9.96%</td>
</tr>
<tr>
<td>56 – 85</td>
<td>43</td>
<td>42.57%</td>
</tr>
</tbody>
</table>

Figure 1: Graphical representation of age distribution in the study

GENDER
Male patients included in this study were about 52% (n=52) and female patients were 48% (n=49)

Table 2: Gender distribution of the patients in the study

<table>
<thead>
<tr>
<th>GENDER DISTRIBUTION</th>
<th>NUMBER OF PATIENTS</th>
<th>IN PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEMALE</td>
<td>49</td>
<td>48%</td>
</tr>
<tr>
<td>MALE</td>
<td>52</td>
<td>52%</td>
</tr>
</tbody>
</table>

Figure 2: Gender distribution observed in the study
BMI
More than 40.59% (n=41) patients who were involved in this study were overweight, and 39.6% patients were with normal weight and 19.8% (n=40) were obese patients.

Table 3: BMI distribution of the patients in the study

<table>
<thead>
<tr>
<th>BMI DISTRIBUTION</th>
<th>NUMBER OF PATIENTS</th>
<th>IN PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNDERWEIGHT</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>NORMAL</td>
<td>40</td>
<td>39.6%</td>
</tr>
<tr>
<td>OVERWEIGHT</td>
<td>41</td>
<td>40.59%</td>
</tr>
<tr>
<td>OBESE</td>
<td>20</td>
<td>19.8%</td>
</tr>
</tbody>
</table>

Disease related characteristics of study population
SOCIAL HABITS
Out of 101, 77 PATIENTS i.e., 88.5% were having no social habits. 8 Patients i.e., 9.2% were alcoholic, 2 patients i.e., 2.3% were having history of chewing tobacco, and 1 i.e., 1.1% patient had history of smoking.
**CO MORBIDITIES**

Out of 101 patients, 48.8% were suffering from Diabetes Miletus, and 53.6% were suffering from Hypertension making it the most common ailment seen in this study sample. 17.9% patients suffered from thyroid illness, 16.7% suffered from Ischemic Heart Disease, 3.6% suffered from Dyslipidemia, 1.2% Patients suffered from cirrhosis, sarcoidosis, epilepsy, heart failure, COPD, mitral valve problem, respiratory failure, UTI, CKD, ALD, Gastroenteritis, CAD, and aspirational pneumonia.

![Figure 5: Comorbidities observed in the patients of the study](image-url)
LABORATORY DATA
69.8% patients have undergone LFT, CBC Test and 63.5% Patients have undergone Ultrasonography of Abdomen and Pelvis which indicates that these are the commonly used tests for diagnosing cholelithiasis. ERCP was performed in 17.7% patients, CT scan of abdomen was performed in 10.4% patients, Biopsy of gall bladder was performed in 8.4%. MRI of abdomen was performed in 2.1% patients and CECT scan was performed in 1% of patients.

![Figure 6: Laboratory data of the patients observed in the study](image)

GALL STONE SIZE
Out of 101 patients, in 32 patients i.e., 35.6% gall stone size was about 3-4 mm, in 13.3% patients gall stone size was 5-6 mm and in 12.2% patients the gall stone size was 6-7 mm. 5.6% patients had gall stone size of 10 mm, rest of the patients i.e., 1.1% were diagnosed with gall stone of size 5 mm, 6mm, 5-7 mm, 11 mm, 17 mm, 9 mm, 16-18 mm, 2 cm etc. Which was seen in very less patients.
TYPES OF GALL STONE

More than half of the patients i.e., 55.1% patients were diagnosed with pigment stones and rest of them i.e., 44.9% were diagnosed with cholesterol stones.

Table 4: Types of gall stones observed in the study

<table>
<thead>
<tr>
<th>TYPES OF GALL STONES</th>
<th>NUMBER OF PATIENTS</th>
<th>IN PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIGMENT STONES</td>
<td>54</td>
<td>55.1%</td>
</tr>
<tr>
<td>CHOLESTEROL STONES</td>
<td>45</td>
<td>44.9%</td>
</tr>
</tbody>
</table>
SEVERITY OF CHOLELITHIASIS

Only 14.1% patients were diagnosed with Chronic Cholelithiasis, rest of the patients i.e., 85.9% patients were diagnosed with Acute Cholelithiasis.

Table 5: Assessment of severity of cholelithiasis of the patients in the study

<table>
<thead>
<tr>
<th>SEVERITY OF CHOLELITHIASIS</th>
<th>NUMBER OF PATIENTS</th>
<th>IN PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACUTE CHOLELITHIASIS</td>
<td>87</td>
<td>85.9%</td>
</tr>
<tr>
<td>CHRONIC CHOLELITHIASIS</td>
<td>14</td>
<td>14.1%</td>
</tr>
</tbody>
</table>

DIET

76% patients were advised to take a soft diet, 42% patients were advised to take liquid, diabetic and low fat diet, and 10% were advised to take normal diet.
TREATMENT
80% of the patients were treated with the pharmacological therapy, 76% of the patients treated by means of surgery.

PHARMACOLOGICAL THERAPY
4 % of patients of the patients got recovered with the symptomatic treatment includes Paracetamol 650 mg 1-1-1 and Ursodeoxycholic acid 300 mg 1-0-1 for 3 months.

TYPES OF SURGERY
Commonly performed surgery was laproscopic cholecystectomy i.e., used in 75.9% patients, in 19.3% patients Endoscopic Retrograde Cholangiopancreatography was performed. In 6% patients Peritoneal lavage was done, and 1.2% of patients both laproscopic cholecystectomy and peritoneal lavage was performed. In 1.2% of patients both laproscopic cholecystectomy and peritoneal lavages as well as CBD sludge biliary sphincture was performed

DISCUSSION
The gallbladder is a small organ located just beneath the liver. The gallbladder holds a digestive fluid known as bile that is released into your small intestine. Cholelithiasis or gall stone are hardened deposits of digestive fluid that can form in your gallbladder. Cholelithiasis is one of the commonly occurring disease which we are observing in many people. In this modern generation most of the individuals have different life styles, diet, social habits to which people are addicted. Our study helps to identify risk factors like any social habits such as alcohol, smoking, tobacco, any drug addiction, diet (fatty foods), obesity, any
comorbidities such as Hypertension, Diabetes Mellitus, Thyroid illness, IHD etc.

Gallstone disease is the most recurrent disorder affecting the biliary system. As calculus disease can be asymptomatic sometimes so it is hard to find out the prevalence.

In this study we have collected 101 cases in total, among them 25 cases were live and remaining cases were collected from medical record department. The total data was collected using a specially designed data collection form

This study aided to identify the common risk factors for cholelithiasis such as obesity, diet, social habits and comorbidities. In this study patients were belonging to age group between 18 to 85 years and out of 101 patients enrolled in the study, 43 patients were belonging to age group between 56 – 85 years old i.e., 42.57%. 36 patients were belonged to age group of 36 – 55 years old i.e., 35.6%. 14 patients were belonged to age group of 18 – 35 years old i.e., 13.86%. Least number of patients 4, 3, 1 were belonging to the groups of 60 – 79 years, 40 – 59 years and 18 – 39 years respectively in the percentage of 3.96%, 2.97%, and 0.98%.

Among the cases collected, out of 101 patients, majority of the patients were males i.e., 52% and rest of them were females i.e., 48%. Hence males were suffering from cholelithiasis more than females.

BMI distribution of the study was examined and found that most of the patients (41) were overweight i.e., 40.59% followed by normal weight (40) i.e., 39.6% and obese (20) i.e., 19.8%.

Among the cases collected, out of 101 patients, 77 patients i.e., 88.5% were having no social habits. 8 patients i.e., 9.2% were alcoholic, 2 patients i.e., 2.3% were having history of chewing tobacco, and 1 patient i.e., 1.1% had history of smoking.

Out of 101 patients, 48.8% were suffering from Diabetes Miletus, and 53.6% were suffering from Hypertension making it the most common ailment seen in this study sample. 17.9% patients suffered from thyroid illness, 16.7% suffered from Ischemic Heart Disease, 3.6% suffered from Dyslipidemia, 1.2% Patients suffered from cirrhosis, sarcoidosis, epilepsy, heart failure, COPD, mitral valve problem, respiratory failure, UTI ,CKD, ALD,Gastroenteritis, CAD, and aspirational pneumonia.

Out of 101 patients, 69.8% patients have undergone LFT, CBC Test and 63.5% Patients have undergone Ultrasonography of Abdomen and Pelvis which indicates that these are the commonly used tests for diagnosing cholelithiasis. ERCP was performed in 17.7% patients. CT scan of abdomen was performed in 10.4% patients. Biopsy of gall bladder was performed in 8.4%, MRI of abdomen was performed in 2.1% patients and CECT scan was performed in 1% of patients.

From the study of 101 patients, in 32 patients i.e., 35.6% gall stone size was about 3-4 mm in 13.3% patients gall stone size was 5-6 mm and in 12.2% patients the gall stone size was 6-7 mm. 5.6% patients had gall stone size of 10 mm, rest of the patients i.e., 1.1% were diagnosed with gall stone of size 5 mm, 6mm, 5-7 mm, 11 mm, 17 mm, 9 mm 16-18 mm, 2 cm etc. Which was seen in very less patients.

Among 101 patients, More than half of the patients i.e., 55.1 % patients were diagnosed with Pigment stones and rest of them i.e., 44.9% were diagnosed with cholesterol stones.

Out of 101 patients, Only 14.1% patients were diagnosed with Chronic Cholelithiasis, rest of the patients i.e., 85.9% patients were diagnosed with Acute Cholelithiasis.

Among 101 patients, 76% patients were advised to take a soft diet, 42% patients were advised to take liquid, diabetic and low fat diet, and 10% were advised to take normal diet.

From the study of 101 patients, 80% of the patients were treated with the pharmacological therapy, 76% of the patients treated by means of surgery.

Pharmacological therapy( Drug name – dose - frequency ) 44%.% of patients of the patients got recovered with the symptomatic treatment includes PARACETAMOL 650 mg 1-1-1 URSODEOXYCHOLIC ACID 300 mg 1-0-1 for 3 months was prescribed to dissolve the gall stones.

Types of surgery: Commonly performed surgery was Laproscopic cholecystectomy i.e., used in 75.9% patients, in 19.3% patients Endoscopic Retrograde Cholangiopancreatography was performed.

In 6% patients Peritoneal lavage was done, and 1.2% of patients both Laproscopic cholecystectomy and peritoneal lavage was performed. In 1.2% of patients both Laproscopic cholecystectomy and peritoneal lavage as well as CBD sludge biliary sphincture was performed. Limitations of the study includes this study involves single site study so data collected was not sufficient to explain completely about the exposure, results and outcomes. very few patients were honest with their social habits.

CONCLUSION

From the study it was found that the patients were affected from cholelithiasis even they have no social habits and BMI of the patient will play a major role for diagnosing cholelithiasis. Majority of patients were diagnosed with gall stone size of 3 – 4 mm followed by 5 – 6 mm, and the largest gall stone size was found in this study was 16 – 18 mm. Commonly prefferd diagnostic test include USG OF Abdomen and pelvis, ERCP. Acute cholelithiasis is more common than chronic cholelithiasis, majority of patients were diagnosed with gall stone size of 3 – 4 mm followed by 5 – 6 mm, and the largest gall stone size was found in this study was 16 – 18 mm. Cholelithiasis can often be successfully treated from pharmacological, supportive and Non - pharmacological treatments. Surgery is the most prefferd treatment option for acute cholelithiasis with large gall stone size.

REFERENCES: