ABSTRACT:

Gall stone disease is a common problem in elderly women, the incidence ranging from 10% to 20% of the world population. In India, it is seven times more common in the north than in the south. Gallbladder stones are known to produce histopathological changes in the gallbladder. It is also one of the predisposing factors for the development of cancer of the gallbladder.

AIM:

1. To study the clinicomorphological spectrum of gall stone diseases.
2. To find out the possible risk factors.
3. To find out the frequency/prevalence of different types of gall stones.

MATERIALS & METHODS: Retrospective study analysis of all cholecystectomy specimens received in the Department of pathology, Vinayaga Mission's Kirubananda Variyar Medical college, Salem from January 2008 to May 2011. Histopathology of gall bladder diseases and biochemical analysis of gall stones done.

RESULTS: The total number of cholecystectomy specimens studied were 78. There were 65 cases of chronic calculous cholecystitis, the highest incidence of these being in the age group of 41-60 years. In this males were 28 and females were 50. All patients underwent ultrasonography to confirm the clinical diagnosis. There were 13 cases of acalculus cholecystitis. On morphological analysis, the commonest gall stone was pigment type and the commonest lesion was chronic cholecystitis by histopathology.

CONCLUSION:

The morphological spectrum of gall stone disease identifies the possible risk factors like increasing age, female sex, multiparity and obesity. People who are at risk, may modify their diet to decrease the risk. Regular exercise may also reduce the risk of gall stones.

Keywords: Cholecystectomy, Calculous cholecystitis and Biochemical analysis

INTRODUCTION:

Gall stone disease is a very common gastrointestinal disorder, present commonly in the western world. 10% of the adults patients have asymptomatic gall stones. The prevalence varies with age, sex and ethnic group. Overall prevalence of gall stone disease was 3.2%. Prevalence increases with age from 21 years to 80 years and was higher in females than in males. Gallstones can occur anywhere within the biliary tree, including the gallbladder and the common bile duct. Gallstones are hard, pebble-like deposits. Gall stones vary in their composition, majority being cholesterol and remaining being mixed and pigmented. Gallstones made out of cholesterol are by far the most common type. Stones are made from excess bilirubin in the bile. Bile is a liquid made in the liver that helps the body to digest fats. Bile is made up of water, cholesterol, bile salts, and other chemicals, such as bilirubin. Such stones are called pigment stones. Mixed and pigment stones are common in northern India.

The stones form when there is an imbalance or change in the composition of bile. The first factor that predisposes to stone formation is how often and how well the gallbladder contracts; incomplete and infrequent emptying of the gallbladder may cause the bile to become overconcentrated and contribute to gallstone formation.

The second factor is the presence of proteins in the liver and bile that either promote or inhibit cholesterol crystallization into gallstones. Increased levels of the hormone estrogen as a result of...
pregnancy, hormone therapy, or the use of birth control pills, may increase cholesterol levels in bile and also decrease gallbladder movement, resulting in gallstone formation.

Other factors are parity, smoking, alcohol, diabetes and overweight.

Symptoms of gall stone diseases are pain in the right upper abdomen, fever, jaundice, abdominal fullness, clay-colored stools, nausea and vomiting. Further complications of gallbladder disease include gallstone pancreatitis, gallstone ileus, biliary cirrhosis and gallbladder cancer. Gallstones may be as small as a grain of sand or they may become as large as an inch in diameter, depending on how long they have been forming. A stone blocking the opening from the gallbladder or cystic duct usually produces symptoms of biliary colic, which is right upper abdominal pain that feels like cramping.

Obstruction of the common bile duct is choledocholithiasis; obstruction of the biliary tree can cause jaundice, obstruction of the outlet of the pancreatic exocrine system can cause pancreatitis. Clinical symptoms were confirmed by ultrasonography of abdomen.

Now a days, laparoscopic cholecystectomy is the treatment of choice in most patients. Pathological changes vary from inflammation to malignancy.

Exclusion criteria : Autolysed specimen and under the age of ten were excluded from the study.

MATERIALS & METHODS:
This is a retrospective study done, in the department of pathology, Vinayaga Mission’s Kirubananda Variyar Medical college, Salem. Total of about 78 cholecystectomies from Jan 2008 to May 2011 were studied. Clinical data and pathological data were reviewed. All cholecystectomy specimens received, were fixed in 10% formalin, submitted to detailed gross examination and microscopy after hematoxylin and eosin staining. Sections were obtained from the fundus, body and neck of the gallbladder. The stones were powdered using a mortar and dissolved in different solvents depending on the type of chemical constituent to be analysed.

Gall stone analysis was done as per the procedure described by Varley Harold3.

RESULTS:
The total number of cholecystectomy specimens studied were 78. In this study, age ranges from 11 to 70 years with a mean of 45.90. The sex distribution in the study is shown in Table-2. Gall bladder lesions are predominantly seen in females (47) as compared to males (31). Multiparity was seen in 38 cases.

The commonest presenting feature was vague upper abdominal pain with or without associated nausea, vomiting and jaundice is shown in Table-3.

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Females</th>
<th>Males</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-20</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>21-30</td>
<td>6</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>31-40</td>
<td>7</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>41-50</td>
<td>14</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>51-60</td>
<td>9</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>&gt;61</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>25</td>
<td>65</td>
</tr>
</tbody>
</table>

Table 1: Age distribution

In this males were 28, and females were 50.
Thamil Selvi, et al, Cholecystitis with Special Reference

Gall stones | Females | 40
---|---|---
| Males | 25
| No Calculi | 13

Table 2: - Sex distribution

Obesity was seen in 29 patients out of 78 cases.

<table>
<thead>
<tr>
<th>No</th>
<th>Symptoms</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Epigastric pain</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Right Hypochondrial Pain</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>Nausea</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>Vomiting</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Jaundice</td>
<td>3</td>
</tr>
</tbody>
</table>

Presenting symptoms

<table>
<thead>
<tr>
<th>Type of stone</th>
<th>Morphology</th>
<th>Number of cases as per gross morphology</th>
<th>Number of cases as per Biochemical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol</td>
<td>Solitary, oval, large &amp; yellow</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Pigment</td>
<td>Multiple, small, jet black &amp; mulberry shape</td>
<td>47</td>
<td>25</td>
</tr>
<tr>
<td>Mixed</td>
<td>Multiple, multifaceted &amp; size varies</td>
<td>8</td>
<td>35</td>
</tr>
<tr>
<td>No stones</td>
<td>-</td>
<td>13</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 3: - Classification of gall stones on the basis of their morphology.

<table>
<thead>
<tr>
<th>Lesions</th>
<th>Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute cholecystitis</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Chronic cholecystitis</td>
<td>67</td>
<td>87</td>
</tr>
<tr>
<td>Polyp</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Granulomatous Cholecystitis</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Empyema</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Eosinophilic cholecystitis</td>
<td>4</td>
<td>3.8</td>
</tr>
<tr>
<td>Carcinoma</td>
<td>1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Table 4: - Lesions associated with cholecystitis

On gross examination, it was found that outer gallbladder surface was congested in 2 patients (2.5%), wall thickness was increased in 43 (55.12%) and polyp in 2 patients (2.5%).

In 31 (39.7%) patients no specific underlying cause was found on laboratory and clinical work-up.

Twenty six patients had diabetes mellitus while two patient had a family history of gall stones. In our study, 30 patients were overweight.

**DISCUSSION:**

Gallstone disease known as cholelithiasis is the most common surgical disorder. Cholelithiasis is common with the incidence ranging from 10% to 20% of the world population, 11% of the general population of the US.

In our study, Total of about 78 cases, the mean age of presentation was 45.90. In a Brazilian study, the age at presentation was 60.2 years. The maximum patients being between 41-60 years (51%).

In our study, Gall stone disease was predominantly seen in females (61.5%) as compared to males (38.4%). Female sex hormones appear to play a role, especially between the ages of 20 and 30.
Another study that researched oestrogen receptors and cholesterol biosynthesis found that oestrogen in particular stimulated the HMG-Co-A reductase enzyme causing increased synthesis of cholesterol and thus putting women at an increased risk of supersaturation. Further supporting the link between estrogen and gallstones, it was determined that postmenopausal women on oestrogen replacement therapy were found to have an increased incidence of gallstones. Progesterone may also contribute to gall stone disease by inhibiting gallbladder contraction and promoting hypomotility and gallbladder stasis.

Maskey CP et al found that the commonest age group for cholelithiasis was below 30 years comprising 37.5%. Our study correlated with studies conducted by Bockus et al.

Of the 47 females, 25 were of multiparous having 3 or more pregnancies. It is proved that increase in number of pregnancies is associated with increased risk of gall stone as seen in world literature. Parity also appears to be a factor in the development of gallstones. Women with more pregnancies and longer lengths of fertility periods appear to have a higher likelihood of developing gallstones than those who remain nulliparous.

A study in Chile found gallstones in 12.2% of multiparous women versus 1.3% of nulliparous women within the same age. Another study found women under the age of 25 years with > 4 pregnancies were 4 to 12 times more likely to develop cholesterol stones compared to nulliparous women of the same age and weight.

Non-vegetarians were found to be more commonly involved with cholelithiasis than vegetarians. The ratio of incidence of cholelithiasis in non-vegetarians and vegetarians was found to be 8:2. The cause could be due to the consumption of high protein and fat. The findings were similar with the findings in a study done by Maskey et al in 1990 AD in Nepal where incidence of cholelithiasis was found more frequently among the people who consumed more fat and protein. In the similar study done by Katwal MR et al in Sikkim and North Bengal. In India, 97% cases of cholelithiasis were found in non-vegetarians.

Obesity is an important risk factor for the development of gallstone diseases. Obese women, defined as a body mass index (BMI) >30kg/m² are at twice the risk of gallbladder disease than women with a normal BMI(<25kg/m²)\(^{11}\). Women with extreme obesity or a BMI >40kg/m² have a 7-fold increased risk of gallstones\(^{6,11}\). The reason for the increased risk of gallstones in obese patients is due to an increased hepatic secretion of cholesterol\(^{5,12}\).

In our study, obesity was seen in 39%. In this present study, the mean weight of the females was 55.8Kg.

Abdominal pain was the most common presenting symptom. Gosh SK et al and Wani et al observed tenderness in the right hypochondrial region as the most common sign.

Histopathological study showed 85.8% of these patients suffering from chronic cholecystitis, 2.5% with acute cholecystitis, 2.5% polyp, 1.2% granulomatous cholecystitis, 1.2% empyema, 5.1% eosinophilic cholecystitis and 1.2% carcinoma.

Biochemical analysis of the stone showed n=37 (57%) of the cases had mixed stones, n=23(35.3%) had pigmented stones and only n=5(7.6%) had cholesterol stones.

Fifteen patients had history of alcoholism. Patients with chronic liver diseases are prone to develop pigment type of gall stone diseases.

CONCLUSION :-

The most commonly involved age group for cholelithiasis (51%) is found to be 41- 60 years with a females being more common than males. Cholelithiasis was found more commonly among non-vegetarians than with vegetarians. Vegetarians to non-vegetarian ratio was 2:8. Majority of the patients presented with right hypochondrial pain. Upper abdominal ultrasonography facilitates the screening and early detection of gallstone disease. Chronic cholecystitis was the most common histopathological diagnosis. Mixed type stone was found to be the most common type of stone comprising 55%, followed by pigment stone and cholesterol stones. Early cholecystectomy is the treatment of choice in symptomatic patients.
REFERENCES:


Authors :

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