Incidence and Outcome of Asymptomatic Gallstones among Peoples Living in Kirkuk City

Chalack Kader Nader
MBChB, FIBMS General Surgery, Depart. of General Surgery; Kirkuk General Hospital, Kirkuk-Iraq.

Dier Omer Mohammed
MBChB, FIBMS General Surgery, Lecturer; Depart. of Surgery; Kirkuk medical college, Kirkuk Univ.; Azadi Teaching Hospital

Abstract

Background: Gallstone disease is a common disease occurring in about 15-20% in Europe & North America. As long as the natural-history of the disease remains asymptomatic in about 80% of cases, it is regarded a benign condition (1).

Patients methods: During the period of this prospective study over five years from January 2009 to December 2015, a total of 600 hospital patients were screened by ultrasound to evaluate the prevalence of asymptomatic gallstones, in 545 subjects no gallstones were found, in the remaining 55 subjects gallstones were found.

Aims: The main purposes of this prospective study are to detect the incidence of asymptomatic gallstone in our community, to evaluate the risk factors in the aetiology of gallstone disease, to know the common presentation and management options of patients with asymptomatic gallstone and to compare them with the symptomatic group.

Results: From 600 patients, 55 patients were found to have asymptomatic gallstones constituting 9.2%, 15 patients were lost from follow up. 40 cases were studied prospectively, and all of them had undergone cholecystectomy.

Conclusion: We found that the percentage of asymptomatic gallstones was (9.2%). Majority of them were females, with female to male ratio of 2:1.

Key words: asymptomatic gallstone, symptomatic gallstone, cholecystectomy.

Introduction

Gallstones are a common hepatobiliary disease. It is expected that 10 – 20% of American adult population will have gallstones. They usually have no symptoms in more than 80-85% of the adult population, but about 1 -2 % of asymptomatic gallstone patients will yearly develop features requiring cholecystectomy, thus ranking cholecystectomy one of the common operations carried out by general surgeons (1).

Cholelithiasis are symptomatic only in 20-30 % of the patients; with pain "colic" considered as the most
common presenting symptom. The complications of asymptomatic gallstone diseases are rare with an incidence between 0.5-1% per year (3). When patients in the asymptomatic group followed up, about 1-4% of them per year will develop the symptoms (2, 4).

Gallstones are divided into 3 main kinds: cholesterol stones, pigment stones (brown/black) or mixed-stones. In USA and West Europe, about 80% of the gallstones are cholesterol stones or mixed ones, while in Asia, about 80% of gallstones are of pigmented type of stones. Mixed or Cholesterol stones are composed of 52–98% of pure cholesterol in addition to mixture of bile pigments, calcium salts, bile acids and lastly phospholipids (1, 3, 5).

In addition to the age, female gender, obesity, multiparity & high blood triglyceride which are well known as atiological factor in favoring lithogenesis, there are other factors such as high frequent variation in weight, intake of certain drugs and some alimentary habits while physical exercise has a protective role against development of gallstone (1, 4, 6).

Factors By using ultrasonography, the factors favoring lithogenesis are identified in addition to those that are already well known such as Age, Female gender, obesity, multiparity & high blood-triglyceride. The risk was related with high repeated variation in the weight with taking of certain medications & with gastrointestinal habits. Exercise also has a major role in the prevention of the development of the clinical gall-stone disease (1, 4, 6).

One of the most important factors that plays role in pathogenenenesis of gallstones is dietary fats. Gallstones occurring mainly in western communities are especially cholesterol stones. Recently it is thought that one of the main factors that has role the in pathogenenenesis of cholesterol gallstones is the chemical and physical events that results mainly from alterations in lipid content of the bile of gallbladder. High saturation of Cholesterol due primarily to excessive secretion of cholesterol inside the bile. Multiple biochemical defects, in addition to diet might cause over-secretion of cholesterol (6, 7).

In the adult population, the incidence of gallstone is high, and with age the incidence increases; and also with increasing age, the incidence of disease complications, such as biliary tract
Incidence and Outcome of Asymptomatic Gallstones among Peoples Living in Kirkuk City

stone, acute-pancreatitis and tumour of the gall-bladder (8).

The management of the patients with asymptomatic gallstones is controversial. Many studies showed that laparoscopic cholecystectomy in patients less than 50 years of age with asymptomatic gallstones is a safe treatment (11, 12, 13, 14, 15). With the general agreement nowadays that cholecystectomy being the treatment modality of choice for symptomatic gallstones. An increase in the diagnosis of asymptomatic gall stones was made due to the availability of abdominal ultrasonography readily when investigating a wide range of abdominal symptomatology. Regarding the management an accidentally discovered gallstones a dilemma will arise since there is a lack of conclusive evidence of the benefits of cholecystectomy. (20, 21, 22)

In this prospective study we tried to estimate the incidence of asymptomatic gallstones in our community, to evaluate the risk factors in the aetiology of gallstone disease, to know the common presentation and management options of patients with asymptomatic gallstone and to compare them with the symptomatic group.

**Patients and methods**

During the period of this prospective study over five years from January 2009 to December 2015, a total of 600 patients were screened by ultrasound to evaluate the prevalence of asymptomatic gallstones. These patients were either attending the general surgery outpatient unit or they had already admitted to the general surgical ward for some surgical problems.

The ultrasounds were done for most of the patients in the department of radiology in Kirkuk general and Azadi teaching hospitals, and they were performed by experienced ultrasonographist working at these hospitals.

We depended on ultrasonography in this study because it is the most useful diagnostic tool in detecting gallstones disease and it is the cheapest, available non- invasive method of investigation. The ultrasonographic finding included thickness of gallbladder wall and size and number of gallstones.

Among these 600 patients, gallstones were found in only 55 (9.2%) persons; while it was not found in the remaining 545 persons.

Asymptomatic gallstones (silent) was prospectively defined as being silent when the patient is not complaining...
from right Hypochondrial pain, jaundice or being provisionally diagnosed as acute or chronic cholecystitis or developed any complication of gallstones disease like acute pancreatitis, gallstone ileus or gallbladder cancer.

For each patient considered to be asymptomatic, a questionnaire was fulfilled with information about the age, sex, weight, height, parity (for females), the chief complaint of the patient, history of any associated diseases that predisposed to gallstones by itself or as a consequence of some drugs such as thiazide diuretics in patient with hypertension, or lipid lowering agents. History of a hemolytic diseases like sickle cell anemia and hereditary red cell spherocytosis were also recorded. Blood group & Rh of each patient has been tested.

The number of patients with asymptomatic gallstones was 55 (9.2%). 15 patients lost to follow up, so the data of the remaining 40 cases have been compared with the data of other 40 cases for whom cholecystectomy have been done for symptomatic gallstones disease during the same period and in the same hospitals.

### Results

40 patients having asymptomatic gallstones were studied and compared with other 40 patients with symptomatic gallstone disease and for which cholecystectomy had undergone.

The demography i.e .age and gender of the patients in the non-symptomatic group are shown in table 1, and figure 1. While those of the symptomatic group are shown in table 2, and figure 2.

There wasnt predominant difference in between the asymptomatic group and symptomatic group in reference to age; but there was a difference in the sex distribution in which there was a higher female ratio (3:1) in the symptomatic group (Table 3).

Regarding the common risk factors in development of gallstones disease, Obesity, body mass index (BMI) of $\geq 30$ and parity were lower in the non-symptomatic group than the group with symptoms (table 4).

1. Obesity:

Asymptomatic group:
The body mass index (BMI) of each patient was calculated from the weight and height which were taken from each patient.

\[
\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2}
\]
22 patients (55%) were found to be obese, as their BMI were 30 & above, the remaining 18 patients (45%) were found to be non-obese, as their BMI were less than 30.

Symptomatic group:
24 patients (60%) were found to be obese, with BMI of 30 & above and 16 patients (40%) were found to be non-obese.

2. Parity:
Asymptomatic group:
From the 26 females with asymptomatic gallstones 15 patients have 4 & more children (58%), 2 patients were nulliparous (8%) and 9 patients have less than 4 children (34%).

Symptomatic group:
Out of the 30 female patients with symptomatic gallstones 20 patients (67%) have 4 & more children, 1 patient (3%) was nulliparous and 9 patients (30%) have less than 4 children.

3. Family history of gallstones:
Asymptomatic group:
6 patients (15%) had gallstones or cholecystectomy in their family history, the age of 5 of them was less than 50 years, while one of them was 63 years old.

Symptomatic group:
Five patients (12.5%) had a family history of gallstones disease or its complications. All of them were of young age group less than 50 years.

The main investigation used and depended on was the Ultrasonography; the main ultrasonographic findings in the asymptomatic and symptomatic groups are shown in table 5.

Out of the 40 patients in the asymptomatic group, only 9 (22.5%) patients (6 females and 3 males) developed symptoms of acute cholecystitis during 3 years follow up and all of them underwent cholecystectomy.

While in the symptomatic group, 34 (85%) patients presented with recurrent attacks of acute cholecystitis.

Six patients presented with history of dyspepsia &/or intolerance to fatty meal.

Complications in the asymptomatic group had occurred in 12 patients (30%) and as following: 3 patients with history of jaundice, 2 patients with empyema of gallbladder, 4 patients with mucocele of gallbladder, 2 patients developed acute pancreatitis, and one patient with carcinoma of the gallbladder which was found accidentally.
Discussion
The percentage of asymptomatic gallstones was 9.2%. This percentage within the range discovered by all of Bartol E., Jennifer, Everhart, et al (2, 10, 11, 12), who found in separate studies that a low incidence of 5% in African Americans and a high incidence of 15% in Mexican American. Also it is nearly similar to the study done by KW Heaton (22) who gave a percentage of 11%.

The percentage of females & males in the symptomatic & asymptomatic groups, showed that the females constitute (65%) of the non-symptomatic group & (75%) of the symptomatic one, while males constitute (35%) of asymptomatic group & (25%) of symptomatic group.

The female to male ratio was about 2 to 1 in the non-symptomatic group & 3 to 1 in the symptomatic one. This is very close to the result obtained by Heaton (22) in his study of a sample of 1896 adults (stratified random) by using real time ultrasound. He found gallstones in women in 22.4% and in men in 11.5% (with or without cholecystectomy). The cholecystectomy rate of people with gallstone is higher in women compared men (43.5% versus 24%).

From the table of age & sex distribution of the asymptomatic group we find that 28 patients (70%) were above the age of 50 year with peak age for this group is the fifties (figure 2). While in the symptomatic group 26 patients (65%) were below the age of 50 year with peak age for this group is the forties (figure 3). This means that the patients with symptomatic gallstones are younger than those with asymptomatic gallstones by 10 years.

The same thing is proved by Heaton (22) in his study that discovered the age of cholecystectomy (symptomatic patients) was, in average, nine years less than the age at detection of silent gallstones in both sexes.

From the sex distribution table we find that in the symptomatic group (who underwent cholecystectomy) women predominate i.e. more women underwent cholecystectomy than men. This is consistent with that found by Everhart (11) that shows that regardless of overall prevalence of gallstone in all communities of the world, females are usually twice likely than males to suffer from gallstones, and females with cholelithiasis are most likely to have had a cholecystectomy than males with cholelithiasis.
Regarding obesity we have found that in our asymptomatic group 22 patients (55%) being obese i.e. a BMI of 30 and above, while in the symptomatic one obesity was found in 24 patients (60%) were. This means that the gallstones disease occurs more frequently in obese patients than average people, and obese patients are more likely to be symptomatic. This fact has been established by Yang H. et al (15). In his follow up study of 90000 women; he discovered that there is a steady increase in cholelithiasis risk with obesity. Women with a body mass index of more than 46 kg/m2 had a seven fold increased risks compared to women whose BMI is less than 25 kg/m2.

The same fact observed by Angelico (27) in his study which demonstrated a high incidence of gallstone disease in women with high BMI. Moreover it confirmed that a notable proportion of non-symptomatic obese patients later on become symptomatic and eventually need cholecystectomy.

Regarding parity we found that 24 female patients (92%) of the asymptomatic group were fertile, [15 patients (58%) had 4 and more children & 9 patients (34%) had less than 4 children] while in the symptomatic group 29 female patients (97%) were fertile, with only 2 patients (8%) of asymptomatic & 1 patient (3%) of symptomatic group were nulliparous. This means that parity is as a risk factor is an important one in gallstone disease and patients with high parity are more likely to be symptomatic.

This fact has been observed by Csendes A. et al (28) who have found that, gallstone disease risk is greater in younger females with high parity. This risk apply to both age and number of pregnancies e.g. a women before the age of 25 and having pregnancies carries a fourfold to twelve fold increase the risk of cholesterol type gallstones when compared with nulliparous women of matched weight and age.

A positive family history of gallstone disease is found in both groups is positive with 15% & 12.5% in the asymptomatic & symptomatic group respectively, most of the patients with the positive family history are of young age group, this could be due to genetic factors that predispose to gallstone formation.

This fact has been observed by Everhart J. E. et al (11). In his study who found an increased incidence of gallstones among the relatives of first
degree of gallstone patients compared with control families. Ultrasonographic findings in this study revealed solitary stone in most of the asymptomatic group 24 patients (60%), while in symptomatic group solitary stone found only in 8 patients (20%), the remaining 32 patients (80%) found to have multiple stones. This finding is the same as that found by Csendes A. (28) in his prospective study in 78 asymptomatic gallstone patients & 366 symptomatic gallstone patients. He found that in the non-symptomatic gallstones group, there were was a significant proportion of patients with single stone, as compared to the symptomatic gallstones group, where patients with multiple stones were significantly higher (more than 12).

Natural history of asymptomatic gallstone in this study showed that after a follow up of 3 years only 9 patients (22.5%) out of the 40 patients developed symptoms and underwent cholecystectomy, and as this outcome is so benign, and then patients with asymptomatic gallstones can be followed up conservatively until they become symptomatic.

The same thing observed by Jennifer Zubler et al (10) they found in their study of asymptomatic gallstones in 32 patients, clinical features developed in eight patients (25%), after average symptom-free period of three years and five months. 7 patients had cholecystectomy and one patient developed perforation of the gallbladder for which he required an emergency procedure. They concluded that most of the patients with asymptomatic gallstones require no treatment and these patients, generally can be followed up conservatively.

**Conclusion**

By the use of ultrasound, 600 cases who were not complaining from any symptoms or signs of gallstones examined, and we found that the percentage of asymptomatic gallstones was (9.2%).

Majority of patients with asymptomatic gallstones are females with female to male ratio of (2:1), while of symptomatic group was (3:1) this means that females are more likely to be symptomatic.

Obesity, body mass index of 30 or more and parity were lower in the non-symptomatic group than that of symptomatic one.

Patients with symptomatic gallstones are younger than those with asymptomatic gallstones by 10 years. The age of cholecystectomy (in symptomatic patients) was, in average,
Incidence and Outcome of Asymptomatic Gallstones among Peoples Living in Kirkuk City

ten years less than the age at detection of silent gallstones in both sexes.
Number of patients with solitary gallstone is more in asymptomatic group in contrast to multiple stones that predominantly found in the symptomatic group, this is because most solitary stones are cholesterol which is less liable to cause obstruction and complications.
The natural history of non-symptomatic gallstone disease is rather a benign one so that watchful waiting is the best course of follow up and these patients do not need removal of gall bladder before development of symptoms.
Regarding the factors that favoring gallstone formation we found positive relation with age, sex, parity, obesity, diabetes, & positive family history.

References
10. Jennifer Zubler MD, Geoffcey Markowski MD, Sandra Yale DO, et
al. the natural history of nonsymptomatic cholelithiasis in the family practice office practices, JAMA & ARCHIVES -1998 May, 7(3).
الإصابة والنتيجة لحصاة المرارة الغير مسببة للاعراض بين الناس في مدينة كركوك

يعتبر مرض حصى المرارة شائع نسبياً، حيث أنها توفر في حوالي 15% من سكان أوروبا وأمريكا الشمالية، إلا أنها تعتبر حميدة نظراً لكونها غير مسببة للاعراض المرتبطة في ما يقرب من 80 في المائة من الحالات.

خلال فترة هذه الدراسة المرتبطة على مدى خمس سنوات من 2009 كانون الثاني/يناير إلى كانون الأول/ديسمبر 2015، تم دراسة 600 مريضاً راجعوا المستشفى لسبب مختلف وتم فحصهم بالموجات فوق الصوتية (السونار) لتقديم مدة انتشار أعراض حصى في المرارة.

في 545 حالة لم يتم العثور على حصى في المرارة، بينما عثر في 55 حالة على حصى في المرارة.

من أهم أهداف هذه الدراسة المرتبطة هي تحديد الإصابة والنتائج المستقبلية لوجود حصى في المرارة الغير مسببة للاعراض في مجتمعنا، وتقييم عوامل الخطر في المسببات المرضية، التعرف على خيارات العلاج للمرضى الذين يعانون من أعراض حصى المرارة ومقارنتها مع مجموعة أخرى من المرضى الذين يعانون من أعراض حصى المرارة.

من بين 600 مريضاً، تم العثور على حصى في المرارة في 55 مريضاً فقط والتي تشكل نسبة 9.2%، فقدت 15 مريضاً من متابعة التشخيص، وتمت دراسة 40 حالة، وكل منهم خضع لعملية استئصال المرارة. وخلاصة: وجدنا أن النسبة المئوية لحصى المرارة الغير مسببة للاعراض هي (9.2%). وكانت غالبيتهم من الإناث، مع نسبة الذكور إلى الإناث من 2:1.
Table 1: Age and sex distribution of the asymptomatic gallstones group.

<table>
<thead>
<tr>
<th>age (in year)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>20-29</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>30-39</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>40-49</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>15%</td>
</tr>
<tr>
<td>50-59</td>
<td>4</td>
<td>10</td>
<td>14</td>
<td>35%</td>
</tr>
<tr>
<td>60-69</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>20%</td>
</tr>
<tr>
<td>70-79</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>80 &amp; above</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2.5%</td>
</tr>
<tr>
<td>Total no.</td>
<td>14</td>
<td>26</td>
<td>40</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2: The distribution of age & sex for the symptomatic gallstones group

<table>
<thead>
<tr>
<th>age (in year)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>30-39</td>
<td>2</td>
<td>7</td>
<td>9</td>
<td>22.5%</td>
</tr>
<tr>
<td>40-49</td>
<td>3</td>
<td>9</td>
<td>12</td>
<td>30%</td>
</tr>
<tr>
<td>50-59</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>60-69</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>70-79</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>80 &amp; above</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2.5%</td>
</tr>
<tr>
<td>Total no.</td>
<td></td>
<td></td>
<td>40</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table 3: Comparison between asymptomatic and symptomatic groups regarding age and sex distribution.

<table>
<thead>
<tr>
<th></th>
<th>Asymptomatic group (no=40 patients)</th>
<th>Symptomatic group (no=40 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age range (years)</td>
<td>23 – 82</td>
<td>26 – 80</td>
</tr>
<tr>
<td>Mean</td>
<td>54</td>
<td>53</td>
</tr>
<tr>
<td>Sex: female/male</td>
<td>26 / 14</td>
<td>30 / 10</td>
</tr>
<tr>
<td>Female: male ratio</td>
<td>2:1</td>
<td>3:1</td>
</tr>
</tbody>
</table>

Table 4: The common differences between the asymptomatic and symptomatic groups of gallstones patients regarding the risk factors.

<table>
<thead>
<tr>
<th></th>
<th>Asymptomatic group (no. 40 patients)</th>
<th>Symptomatic group (no. 40 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>22 (55%) patients were obese</td>
<td>24 (60%) patients were obese</td>
</tr>
<tr>
<td>BMI</td>
<td>BMI ≥ 30 in 22 (55%)</td>
<td>BMI ≥ 30 in 24 (60%)</td>
</tr>
<tr>
<td>Parity</td>
<td>15 (58%) patients have ≥ 4 children</td>
<td>20 (67%) patients have ≥ 4 children</td>
</tr>
<tr>
<td></td>
<td>9 (34%) patients have &lt; 4 children</td>
<td>9 (30%) patients have &lt; 4 children</td>
</tr>
<tr>
<td>Family history</td>
<td>6 (15%) patients have positive family history of gallstones</td>
<td>5 (12.5%) patients have positive family history of gallstones</td>
</tr>
</tbody>
</table>
Table 5. The main ultrasonographic findings in the asymptomatic and symptomatic groups of patients with gallstones disease.

<table>
<thead>
<tr>
<th>Ultrasonographic findings</th>
<th>Asymptomatic group (no. 40 patients)</th>
<th>Symptomatic group (no. 40 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of stones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solitary stone: 24 (60%)</td>
<td>Solitary stone: 8 (20%)</td>
<td></td>
</tr>
<tr>
<td>Two stones: 4 (10%)</td>
<td>Two stones: 6 (15%)</td>
<td></td>
</tr>
<tr>
<td>Multiple stones: 12 (30%)</td>
<td>Multiple stones: 26 (65%)</td>
<td></td>
</tr>
<tr>
<td>size of stones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 cm: 13 (32.5%)</td>
<td>&lt; 1 cm: 6 (15%)</td>
<td></td>
</tr>
<tr>
<td>1-2 cm: 22 (55%)</td>
<td>1-2 cm: 30 (75%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 2 cm: 5 (12.5%)</td>
<td>&gt; 2 cm: 4 (10%)</td>
<td></td>
</tr>
<tr>
<td>Gallbladder wall thickness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2mm: 33 (82.5%)</td>
<td>&lt; 2mm: 12 (30%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 3mm: 7 (17.5%)</td>
<td>&gt; 3mm: 28 (70%)</td>
<td></td>
</tr>
<tr>
<td>Pre-operative signs of inflammation</td>
<td>9 (22.5%)</td>
<td>34 (85%)</td>
</tr>
</tbody>
</table>

Figure 1: Age and sex distribution of the asymptomatic gall stones group
Figure 2: Age and sex distribution of the symptomatic gall stones