Frequency of gallstones in female healthcare workers of childbearing age in Malatya region

Hulya Aladag\textsuperscript{a}, Murat Aladag\textsuperscript{b,*}

\textsuperscript{a}Turgut Ozal University, Malatya Training and Research Hospital, Department of Obstetrics and Gynecology, Malatya, Türkiye
\textsuperscript{b}Turgut Ozal University, Malatya Training and Research Hospital, Department of Internal Medicine, Malatya, Türkiye

Abstract

Aim: Gallstones are seen more frequently in women and in both sexes in the society, causing serious health problems and reducing the quality of life. In this study, we aimed to evaluate and present the frequency of gallstones among female healthcare professionals of reproductive age in the Malatya region. This is the first study in our country in the field of gallbladder stone frequency among female healthcare professionals of childbearing age.

Materials and Methods: We included all female employees of childbearing age working in our hospital, and the frequency of gallstones was found by retrospectively evaluating the routine records of healthcare professionals in the hospital. The frequency of gallstones in the patients was obtained from routine abdominal ultrasonography records made during health checks and abdominal tomography records when necessary. Frequency of data was used as number and percentage for statistical evaluation of data, and Fisher’s chi-square test was used for evaluation of non-numerical data.

Results: The average age of female employees of childbearing age is 30.02 ± 5.42 years and the age range is 19-50 years. Of 1224 healthcare workers, 65 (5.3%) had gallbladder stones and 1.6% had polyps, and 35 (2.8%) had a history of cholecystectomy. Only the difference between gallstone rates according to body weight was statistically significant (p<0.01). There was no statistically significant difference between birth, number of miscarriages and height between those with and without gallstones (p>0.05). In our cases, it was determined that gallstones increased in parallel with age and weight.

Conclusion: As a result, the frequency of gallstones among female healthcare workers of reproductive age was statistically significantly proportional to body weight. The incidence of gallstones was directly proportional to weight, patient age, and working time in the hospital.

Introduction

Gallstones are very common all over the world [1-4]. In the United States, for example, about 6 percent of men and 9 percent of women have gallstones [3]. The prevalence of gallstone disease increases with age in both sexes, reaching a plateau after 50 and 60 years of age in women and men, respectively [2,3].

The prevalence of cholelithiasis varies widely by geographic region and appears to be higher in White and Native American populations compared to Eastern European, African-American, and Japanese populations [4-12]. The variability in the prevalence of gallstones can be attributed to both genetic and dietary factors.

Those with gallstones may be asymptomatic for years, sometimes they may present with complications related to biliary colic or gallstone disease. When gallstones become symptomatic, they most often apply to the physician with biliary colic [6-9].

These symptoms are sometimes seen with biliary colic. Atypical symptoms reported in patients with gallstones include: belching, postprandial satiety/early satiety, regurgitation, abdominal bloating, epigastric or retrosternal burning, nausea or vomiting alone, chest pain, nonspecific abdominal pain [12-14].

The most common complication of gallstones is cholecystitis, choledocholithiasis and gallstone pancreatitis with and without cholangitis. Rare complications of gallstones are gallbladder cancer, gallstone ileus and Mirizzi syndrome [15-17].
Evaluation typically begins with a transabdominal ultrasound, as this is the most sensitive method for detecting gallstones. In patients with typical biliary colic but no gallstones on ultrasonography, transabdominal ultrasound should be repeated, usually within a few weeks, to detect missed gallstones. Particular attention should be paid to areas of the gallbladder where stones are easily missed in re-examination [14,15]. If repeated transabdominal ultrasound is negative, additional evaluation should be done with endoscopic ultrasound, and if it is negative, sludge or microlithiasis can be detected by bile microscopy [18,19].

Other imaging studies, including abdominal radiography and abdominal computed tomography (CT) scan, are less sensitive than ultrasound to detect gallstones. Only 10 percent of gallstones contain enough calcium to make them radiopaque enough to be seen on a plain radiograph. Because gallstones are isodense with bile, they may be missed on CT. The sensitivity of scanning gallstones with CT is 55-80% [6,17].

Transabdominal ultrasonography is generally considered the most useful test for detecting the presence of gallstones, as it is noninvasive, readily available, relatively inexpensive, and does not expose the patient to ionizing radiation. On ultrasonography, gallstones are seen in the lumen as a mass that creates an acoustic shadow [18,19]. Gallbladder polyps have a similar appearance to gallstones, but they do not form an acoustic shadow.

Most patients with gallstones are asymptomatic and will remain so throughout their lives. About 15 to 25 percent of those with incidental (asymptomatic) gallstones will become symptomatic after 10 to 15 years of follow-up [17-19]. Patients who develop symptoms initially report biliary colic rather than symptoms associated with complications of gallstone disease (such as cholecystitis, pancreatitis, and cholecodolithiasis). When a complication develops in a patient with gallstones, the risk of more severe complications is approximately 30 percent per year [20-21].

Gallstones impair the person’s quality of life, reduce work efficiency, and even rarely lead to mortality with serious complications. In this study, we aimed to retrospectively evaluate the incidence of gallstones in women of childbearing age in our hospital. This study is the first study on the frequency of gallstones among female employees of childbearing age in our country.

Materials and Methods
We included 1,224 female employees of childbearing age working in our hospital. The findings of the health workers were obtained from the hospital electronic resources and the records of the workplace physician, where the routine examinations of the institution employees in the hospital were recorded in the last two years. In all cases with abdominal ultrasonographic examination, age, weight, height, cholecystectomy, number of births, miscarriage, and gallstones in cases with gallstones, biliary colic, postprandial bloating, nausea, vomiting, pain after fatty foods, indigestion and gallbladder stones. It was evaluated whether it was single or multiple.

Table 1. Demographic findings of healthcare workers and gallstones.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>With gallstones</th>
<th>Without gallstone</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight average (kg)</td>
<td>70.3</td>
<td>65.4</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Height average (cm)</td>
<td>161.4</td>
<td>160.2</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Average birth</td>
<td>2.4</td>
<td>2.1</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Average abort</td>
<td>0.5</td>
<td>0.3</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>With cholecystectomy</td>
<td>35 (%2.8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Working time of healthcare workers and frequency of gallstones.

<table>
<thead>
<tr>
<th>Working time</th>
<th>n</th>
<th>%</th>
<th>Gallstone (n)</th>
<th>Gallstone %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 year</td>
<td>150</td>
<td>12.2</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>2-5 year</td>
<td>280</td>
<td>22.8</td>
<td>15</td>
<td>5.3</td>
</tr>
<tr>
<td>6-10 year</td>
<td>600</td>
<td>49.0</td>
<td>38</td>
<td>6.3</td>
</tr>
<tr>
<td>More than 11 years</td>
<td>194</td>
<td>15.8</td>
<td>6</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Table 3. Age groups of healthcare professionals and the frequency of gallstones

<table>
<thead>
<tr>
<th>Age groups</th>
<th>n</th>
<th>%</th>
<th>Gallstone (n)</th>
<th>Gallstone %</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-25</td>
<td>180</td>
<td>14.7</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>2-5 year</td>
<td>280</td>
<td>22.8</td>
<td>15</td>
<td>5.3</td>
</tr>
<tr>
<td>6-10 year</td>
<td>544</td>
<td>44.4</td>
<td>34</td>
<td>6.25</td>
</tr>
<tr>
<td>More than 11 years</td>
<td>220</td>
<td>17.9</td>
<td>13</td>
<td>5.9</td>
</tr>
</tbody>
</table>
healthcare workers who had undergone cholecystectomy were operated for nausea, vomiting, abdominal distension and biliary colic. Of 65 patients with gallbladder stones detected in ultrasonography, 5 (7.6%) had a single stone and 60 (92.3%) had multiple stones. Of 1224 healthcare workers, 65 (5.3%) had gallbladder stones and 1.6% had polyps, and 35 (2.8%) had a history of cholecystectomy. When we look at the studies conducted in our country, the operation rate for gallstones was similar to the rates in our hospital staff. When we look at the international literature, the rate of cholecystectomy due to gallstones is lower in our country. It was observed that gallstones were more common in our study group among individuals who had worked for longer years (Table 2), were older (Table 3), were overweight, and had a higher number of pregnancies (birth and miscarriage) (Table 1). Gallstones were observed with the highest rate of 6.3% in the group who worked in the hospital for 6-10 years (Table 2). Gallstones were most common in the 36-45 and 45-50 age groups, with a rate of 6.24% and 5.9%, respectively (Table 3). Only the difference between gallstone rates according to body weight was statistically significant (p<0.01). There was no statistically significant difference between birth, number of miscarriages and height between those with and without gallstones (p>0.05). In our cases, it was determined that gallstones increased in parallel with age and weight.

**Discussion**

When many epidemiological studies in western countries are examined, it is seen that the frequency of gallstones is increasing [2-4,22-24]. It is observed that the frequency of gallstones is higher in women than in men, and this frequency increases with age, weight, number of births and diabetes [22-24]. Similarly, in some studies, it is seen that the frequency of gallstones is associated with diet, physical activity and even smoking. Barratta et al., in their study in Italy, found the frequency of gallstones in women to be 22%, and stated that this frequency was higher in women with obesity, hypertensive and metabolic syndrome [22]. Similarly, Gillman RH et al. found the prevalence of gallstones to be 4-10% in men and 18-20% in women [23]. They showed that while the prevalence of gallstone disease increased significantly with age and body mass index, it decreased significantly with alcohol consumption [23]. Studies have shown that obesity is the most important risk factor for gallstones in women and statistically significant in men [22,23]. Promoting appropriate eating habits may result in a reduction in body mass and thus indirectly reduce other risk factors for cholelithiasis (type II diabetes incidence and serum triglyceride level) [24,25].

In our study, diabetics constituted 5% of healthcare workers, and the rate of gallstones in these individuals was higher than non-diabetic patients, but the difference was not statistically significant (p>0.05). In our study, it was observed that those with gallbladder stones and cholecystectomy were older and heavier individuals, and this is consistent with the literature. In studies conducted in our country, Özütürk et al. reported the incidence of cholelithiasis in the normal population in the Aegean region as 7.79%, and Beyler et al. reported 5.25% (7% in women, 3.5% in men) [26,27]. Studies have shown a striking increase in the risk of gallstone disease with obesity: women with a body mass index (BMI) above 45 kg/m² had a seven-fold higher risk of gallstones compared to those with a BMI below 24 kg/m² [28]. In our cases, we observed that those with gallstones were more overweight than those without. There was a statistically significant difference in weight between those with and without gallstones. There was a statistically significant difference in weight between those with and without gallstones (p<0.05).

Gallstones are more common in some groups with liver disease than others. For example, in cirrhotic patients, Ökten et al. reported the incidence of gallstones as 24% (33% in women, 17% in men), and Koşar et al. reported as 30.9% [29,30]. J Koshiol et al. in their study in Chile, found the frequency of gallstones to be 36%, especially in obese women with an average age of 59 (50-74 years), and reported that the frequency of gallstones was closely related to female gender, advanced age and diabetes [31]. Yuan S et al., in their study in 2022, reported that obesity, type 2 diabetes and smoking are independent risk factors in gallstone disease [32]. The frequency of gallstones in diabetic patients in our country was determined by Güneri S et al. 35%, Kadkhövji et al. reported that 13% of female patients and 10.5% of male patients had cholelithiasis [33,34]. The frequency of gallstones increases with age. In our country, Karayaçar R et al. reported the frequency of gallstones as 15.4% in postmenopausal women [35]. In a study by A Kichoo friends in the United States, they found that 149259 of patients with more than 14 million hospitalizations had non-alcoholic fatty liver disease (NAFLD). The prevalence of NAFLD was 64% of women with gallstones and 35% of men. There is a higher rate of gallstones in those with non-alcoholic fatty liver, and significant improvements have been observed in both the frequency of gallstones and metabolic syndrome and NAFLD parameters with the right lifestyle changes and diet in these patients [36,37]. In our study, the frequency of gallstones was found to be lower among female healthcare workers of reproductive age working in the Malatya region than in western countries. Gallbladder stones and body weight were found to be statistically significantly related in healthcare workers of childbearing age. Again, the frequency of gallstones was seen most frequently in the age range of 36-45 and 45-50 years. The incidence of gallstones was found to be higher in those who worked longer in the hospital.

It was observed that gallstones were more common in our study group among individuals who had worked for longer years (Table 2), were older (Table 3), were overweight, and had a higher number of pregnancies (birth and miscarriage) (Table 1). Gallstones were observed with the highest rate of 6.3% in the group who worked in the hospital for 6-10 years (Table 2). Gallstones were most common in the 36-45 and 45-50 age groups, with a rate of 6.24% and 5.9%, respectively (Table 3). Only the dif-
ference between gallstone rates according to body weight was statistically significant (p<0.01). There was no statistically significant difference between birth, number of miscarriages and height between those with and without gallstones (p>0.05). In our cases, it was determined that gallstones increased in parallel with age and weight.

Conclusion
As a result, it was concluded that in order to prevent gallbladder stones and complications related to gallstones, lifestyle changes should be made both among healthcare professionals and the public. Exercise habits should be made into a lifestyle to include the whole population, and a healthy diet should be adopted.

Ethical approval
Ethical approval was obtained for this study from Malatya Turgut Özal University Non-Interventional Clinical Research Ethics Committee (Date: 26.05.2022, Decision number: 2022/101).

References