

*Original research-Orijinal araştırma*

## Prevalence and risk factors of gallbladder polyps in Erzurum region

### *Erzurum bölgesinde safra kesesi polip sıklığı ve risk faktörleri*

**Mehmet Demir, İhsan Doru, Hilmi Ataseven, Yavuz Albayrak**

Department of Gastroenterology (M. Demir, MD), Department of Radiology (İ. Doru, MD), Department of General Surgery (Y. Albayrak, MD), Erzurum Teaching and Research Hospital, TR-25000 Erzurum, Department of Gastroenterology (H. Ataseven, MD), Cumhuriyet University School of Medicine, TR-58140 Sivas

#### **Abstract**

**Aim.** Gallbladder polyps are generally determined incidentally during ultrasonography or following cholecystectomy. In our country, data on incidence of gallbladder polyps are insufficient. Our purpose in this trial was to determine prevalence and risk factors of gallbladder polyps in Erzurum region. **Method.** This trial was conducted by retrospective evaluation of reports of abdominal ultrasonographies performed in Department of Radiology of Erzurum Education and Research Regional Hospital between January 2009-September 2009. In patients diagnosed with gallbladder polyps; gender, age, serum lipid levels, number and diameter of gallbladder polyps, presence of gallbladder stones and hepatosteatosis were determined and recorded. Hundred and forty seven healthy individuals, comparable to patient group in terms of age and gender, admitted to hospital for check-up evaluation with no chronic disease were enrolled as control group. **Results.** Gallbladder polyps were found in 132 (1.8%) of a total of 7562 patients, Among patients with gallbladder polyps, 85 (64.4%) were women and 47 (35.6%) were men and mean age was 46.8±15.4. Mean size of the polyps was 5.4 mm (1.5-26 mm). A correlation was found between gallbladder polyps and low HDL, high LDL, high total cholesterol levels and hepatosteatosis (p<0.05). No statistically significant correlation was found between serum triglyceride level and gallbladder polyps (p>0.05). **Conclusion.** In this trial performed in a large patient population, prevalence of gallbladder polyps in Erzurum region was found to be 1.8% and it was found to be more prevalent in individuals >40 years of age in general. In addition, a correlation was found between gallbladder polyps and female gender, age, high LDL and total cholesterol, low HDL cholesterol and hepatosteatosis.

**Keywords:** Gallbladder polyp, ultrasonography

#### **Özet**

**Amaç.** Safra kesesi polipleri genellikle ultrasonografi ya da kolesistektomi sonrasında rastlantısal olarak tespit edilirler. Ülkemizde safra kesesi poliplerinin görülme sıklığı ile ilgili veriler yetersizdir. Bu çalışmadaki amacımız Erzurum bölgesinde safra kesesi polip sıklığını belirlemek ve risk faktörlerini araştırmaktır. **Yöntem.** Bu çalışma, Ocak 2009 - Eylül 2009 tarihleri arasında Erzurum Bölge Eğitim ve Araştırma Hastanesi Radyoloji kliniğinde yapılan batın ultrasonografilerin retrospektif olarak değerlendirilmesiyle yapıldı. Safra kesesi polipi tespit edilen hastaların cinsiyet, yaş, serum lipit düzeyleri, safra kesesi poliplerinin sayı ve çapları, safra taşı ve hepatosteatoz varlığı tespit edilerek kaydedildi. Kontrol grubu olarak yaş ve cinsiyet ile uyumlu bilinen kronik hastalığı olmayan ve check-up amaçlı hastaneye başvuran ardışık 147 sağlıklı kişi alındı. **Bulgular.** Toplam 7562 hastanın 132'sinde (%1,8) safra kesesi polipi saptandı. Safra kesesi polipi saptanan hastaların 85 (%64,4)'i kadın, 47 (%35,6)'si erkek olup yaş ortalaması 46,8±15,4 idi. Ortalama polip büyüklüğü 5,4 mm (1,5-26 mm) olarak tespit edildi. Düşük HDL, yüksek LDL, yüksek total kolesterol düzeyleri ve hepatosteatoz ile safra kesesi polipleri arasında ilişki saptandı (p<0,05). Serum trigliserit düzeyi ile safra kesesi polipi arasında istatistiksel olarak anlamlı bir ilişki saptanmadı (p>0,05) **Sonuç.** Geniş hasta popülasyonunda yapılan bu çalışmada Erzurum çevresindeki erişkinlerde safra kesesi polip sıklığı %1,8 idi ve safra kesesi polipi görülme yaşının ise genellikle 40 yaş üzeri olduğu saptandı. Ayrıca safra kesesi polipi ile kadın cinsiyet, yaş, yüksek LDL ve total kolesterol, düşük HDL kolesterol ve hepatosteatoz arasında ilişki olduğu tespit edildi.

**Anahtar sözcükler:** Safra kesesi polibi, ultrasonografi

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**Corresponding address:**

Dr. Mehmet Demir, Gastroenteroloji Anabilim Dalı, Erzurum Bölge Eğitim ve Araştırma Hastanesi, TR-25000 Erzurum. E-posta: drmehmetdem@yahoo.com

## Introduction

Gallbladder polyps (GP) are mucosal lesions which develop in gallbladder wall and protrude into the lumen. They are usually diagnosed incidentally during ultrasonography (USG) or cholecystectomy. Parallel to the more frequent use of USG, diagnosis of GP have increased. GPs are diagnosed as hypoechoic, fixed and solid masses in USG [1]. Even though most cases of GPs are benign, diagnosis is of clinical importance due to a potential for malignity. Incidence of GP in surgically removed gallbladders was found to be 0.004-13.8% [1]. Incidence of GP during USG evaluations was reported to be 1.4-9.5% with predominance in the middle-aged men [2]. In our country, studies on incidence of GP are limited [3, 4]. Our purpose was to determine prevalence of gallbladder polyps in Erzurum region using USG and to investigate possible risk factors.

## Material and Methods

This trial was conducted by retrospective evaluation of abdominal ultrasonography reports. Ultrasonographies were performed in the Radiology Department of Erzurum Education and Research Regional Hospital between January 2009-September 2009. Exclusion criteria were history of cholecystectomy, USG performed under emergency conditions and/or during postprandial period, no imaging of gallbladder and incooperation of the patient. Files of patients with GPs diagnosed by USG were analyzed. Their gender, age, serum total cholesterol, serum low density lipoprotein (LDL) cholesterol, serum high density lipoprotein (HDL) cholesterol and serum triglyceride levels, number and size of GPs detected by USG and presence of gallbladder stones and hepatosteatosis were recorded. Serum cholesterol and triglyceride levels were measured by Dimension Clinical Chemistry System (Dade Behring Inc. Newark, DE 19714, USA). In diagnosis of GP with USG, compliance with the following criteria were used: projection of lesion into gallbladder lumen, no acoustic echo and no shift of location with a change in position of patient. In ultrasonographic examinations, Toshiba xario (Japan) realtime device with convex probe of 3.5-5.5 MHz was used. A hundred and forty-seven healthy individuals (94 women, 53 men, mean age 44.9±14.5), comparable to the patient group in terms of age and gender and admitted to hospital for check-up evaluation with no chronic disease were enrolled as the control group.

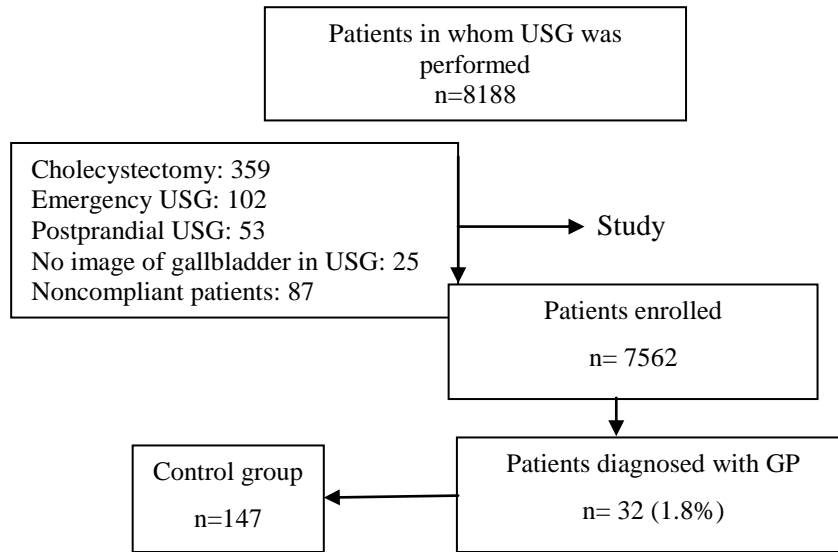
## Statistical Analysis

Data were entered in SPSS (Statistical Package for Social Sciences) 13.0 program and analysis was performed with this program. T-test was used for measurable data in compliance with parametric test conjecture, while chi-square test was used in analysis of numerical data. Value of P<0.05 was accepted as statistically significant.

## Results

A total of 8188 abdominal ultrasonographies performed in the Radiology Department of Erzurum Education and Research Regional Hospital between January 2009-September 2009 were evaluated; 359 cases with cholecystectomy, 102 cases with emergency USGs, 53 post-prandial USG cases, 25 cases in whom gallbladder was not identified clearly and 87 noncompliant cases were excluded and 7562 patients in compliance with study criteria were enrolled (Figure 1). Among patients enrolled, 2890 were men (38.2%) and 4672

were women (61.8%). Gallbladder polyp was determined in 132 (1.75%) of 7562 patients.



**Figure 1. Flowchart of patient selection (n; number of patients, GP; gallbladder polyp, USG; ultrasonography)**

Among patients diagnosed with GP, 85 (64.4%) were female and 47 (35.6%) were male and mean age was  $46.8 \pm 15.4$ . In the control group, 94 (63.9%) were female and 53 (36.1%) were male with a mean age of  $44.9 \pm 14.5$ . No statistically significant difference was found between patients with GP and the control group in terms of age and gender. Female/male ratio among patients with GP was (85/47) 1.8. Mean size of the polyps was found to be 5.38 mm (1.5-26 mm). In 37 cases (28.0%) diameter of polyp was 6-9 mm; in 5 cases (3.8%), it was 10-16 mm, in 1 case (0.6%) it was 26 mm and in the remaining 89 patients (67.4%), it was smaller than 6 mm. While a single polyp was found in 93 cases (70.5%), there were 2 polyps in 20 cases (15.2%) and 3 or more polyps in 19 cases (14.4%). Mean serum HDL cholesterol value was  $38.8 \pm 13.2$  mg/dl in the GP and  $48.6 \pm 12.4$  mg/dL in the control group respectively and a statistically significant difference was present between two groups ( $p < 0.001$ ,  $p < 0.05$ ). Mean serum LDL cholesterol was found to be  $135.6 \pm 45.3$  mg/dL in the GP and  $126.0 \pm 32.9$  mg/dL in the control group respectively and there was also a statistically significant difference between two groups ( $p = 0.04$ ,  $p < 0.05$ ). Serum total cholesterol was found to be  $185.4 \pm 48.2$  mg/dL in GP and  $172.2 \pm 41.9$  mg/dL in control group; difference was statistically significant ( $p = 0.01$ ,  $p < 0.05$ ). Mean blood triglyceride level was  $166.11 \pm 110.50$  mg/dL in the GP and  $147.6 \pm 72.7$  mg/dL in the control group respectively and no statistically significant difference was found between the groups ( $p = 0.09$ ,  $p > 0.05$ ). Hepatosteatorosis was present in 22 patients in GP group (16.7%) while in control group, it was determined in 8 patients (5.4%) and there was a statistically significant difference between groups ( $p = 0.002$ ,  $p < 0.05$ ) (Table 1).

## Discussion

Gallbladder polyps are generally insidious; they rarely cause symptoms and most cases are identified incidentally by imaging techniques or following cholecystectomy [2]. In recent years, widespread and frequent use of USG and technological developments increased the rate of diagnosis of GPs [5]. Abdominal USG is the most important non-invasive diagnostic tool in diagnosis of GP. In USG, GPs are identified as fixed soft tissue protuberations in bladder wall, projecting into the lumen with no acoustic echo. Sensitivity of USG in determination GP may be as high as 90% [5, 6].

**Table 1. Comparison of patients with gallbladder polyp and control group**

	Patient group	Control	P values
Number of patients	132 (1.8%)	147	
Mean size of polyp	5.38 mm	---	
Gender (Female/Male)	85/47	94/53	>0.05 (0.93)
Age	46.8±15.4	44.9±14.5	>0.05 (0.29)
Mean HDL (mg/dl)	39.8±13.2	48.6±12.4	<0.05 (<0.001)
Mean LDL(mg/dl)	135.6±43.3	126.0±32.9	<0.05 (0.04)
Mean total cholesterol (mg/dl)	185.4±48.2	172.2±41.9	<0.05 (0.01)
Mean triglyceride (mg/dl)	166.1±110.5	147.6±72.8	>0.05 (0.09)
Hepatosteatosi	22/132	8/147	<0.05 (0.002)

HDL: Serum high density lipoprotein cholesterol levels, LDL: serum low density lipoprotein cholesterol levels

Prevalence of GP in resected gallbladders were reported as 0.004-13.8% [1]. Incidence of GP during USG evaluations were reported as 1.4-9.5% [7-11]. In a recent prospective trial conducted in Turkey, prevalence of GP was determined as 1.9% [4]. This rate is similar to rate indicated in our trial (1.8%).

There are trials which indicate that distribution of gender is relatively equal or it's seen more frequently in women [4, 6]. Similarly in our trial, GP was determined 1.8-times more frequently in women. In one trial, contrary to our results, it was reported that GP is seen more frequently in middle-aged men [9]. We believe that these contradictory results may be due to variations in study designs. In previous trials, mean age of GP was reported as 4.-5th decades [8-11]. In our trial, mean age among patients with a diagnosis of GP was 46.8±15.4 and this value was in compliance with previous trials. This result indicated that in both genders, GP is usually seen after 40 years of age.

It was reported that polyp may develop in 4-8% of patients with gallbladder stones but no association was found between factors which are accepted to be related to stone development, such as age, obesity, number of pregnancies, use of estrogen-progesteron [4, 5, 9, 12]. In our trial, no gallbladder stones were observed in patients with GP. On the other hand, we believe that female gender, which is a risk factor for cholelithiasis (and perhaps, number of pregnancies and use of female sex hormones as associated with this factor) and ages over 40 years may be regarded as risk factors for GP.

Cholesterol polyps are the most frequent polypoid lesions seen in clinical practice. They constitute 60% of all polypoid lesions. It was suggested that cholesterol polyps develop through phagocytosis and accumulation of cholesterol esters and lipids by macrophages located in lamina propria of gallbladder mucosa. This accumulation is believed to be due to a dysregulation in cholesterol metabolism [13]. However, there are trials which indicate that there is no correlation between cholesterol polyps and serum LDL, HDL, triglycerides and total cholesterol levels [7, 14]. Still, in another trial, it was suggested that there is a correlation between development of polyps and lipid metabolism and that other unknown factors may also influence development of these lesions [15]. In our trial, serum HDL cholesterol levels in GP group was found to be lower than control groups and difference was statistically significant while serum LDL cholesterol and total cholesterol levels were higher than controls and differences were again statistically significant ( $p<0.05$ ). Blood triglyceride level was lower in GP group but no statistically significant difference was found ( $p>0.05$ ). In addition, we determined that hepatosteatosi was more frequent in GP group and difference was statistically significant ( $p<0.05$ ). These results indicate that there is a dysregulation in cholesterol metabolism which may be correlated to GP.

Main factors limiting our trial were retrospective design, relatively selected patients, dominance of female gender and no histopathological findings in GP patients.

In conclusion, prevalence GP was determined as 1.8% in this large adult population in Erzurum region and it was observed to be more prevalent in individuals over 40 years of age. In addition, we determined a correlation between GP and female gender, age, high

LDL and total cholesterol, low LDL cholesterol and hepatosteatosi. Even though GP is a benign condition in general, it is clinically important due to its potential of cancer development; therefore, community-based studies are required to determine the incidence of GP.

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