

# Acute Cholecystitis: From ER to Surgery

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## ABSTRACT

**Background:** Biliary lithiasis is one of the most common diseases worldwide. Cholecystectomy is its main treatment. Laparoscopic cholecystectomy is considered as a first choice treatment in most cases.

**Material and methods:** One hundred and twelve patients were recruited for the present study, after visiting the emergency department of the University General Hospital of Larissa, where a diagnosis of biliary lithiasis was established. A questionnaire with both open and closed –type questions was used.

**Results:** Women represented 54,5% of our sample. Positive ultrasonography findings were present in the majority of patients, while leucocytosis was found in 52.7%. Almost all of the patients were admitted to the surgical department and most of them underwent a laparoscopic cholecystectomy. The vast majority of those patients, who had a similar attack in the past, had already undergone ultrasonography investigation, and a biochemistry test had been performed in half of them, in primary care settings.

**Conclusions:** The incidence of cholelithiasis and its dangerous complications warrant a thorough investigation of these patients.

**Key words:** Biliary lithiasis, Laparoscopy, Hospitalization, Emergency Department,

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## INTRODUCTION

Cholelithiasis is a surgical disease with important costs for public health (Schirmer 2005, Papadopoulos 2006). A spectacular progress has been made during last years in surgical treatment of this condition, with older techniques having been limited to certain indications and with laparoscopic approach to have become first choice treatment in most cases (Mulvihill 1994, Robertson 1998, Liguori 2003) However, the contribution of early diagnosis to avoid costs and further complications and discomfort of patients is still important. For this reason, prompt diagnosis of

cholelithiasis and proper guidance of the patients is the first step towards treatment (Venneman 2006). The diagnosis of this condition has rather been easy by modern imaging techniques, but clinicians have the responsibility to suspect diagnosis and connect symptoms with existing gallstones and to avoid a misdiagnosis (Festi 1999 Berger 2004, Gupta 2004). A comprehensive laboratory investigation is essential for the diagnosis of pancreatitis, a dreadful complication. The thorough investigation in primary health care level is expected to minimise complications and to lead patients to therapy as quick as possible. The

purpose of the present work was to record modern trends as well as possible flaws in the primary care of patients with biliary tract lithiasis. The objective was to collect information in the domain of primary health care of these patients, from time of their presentation in the Emergency Room (ER), to discharge, either having been operated or not.

### Material and methods

Data were collected prospectively, using questionnaires administered to patients presenting to the Medical and Surgical ER of Larissa University Hospital between January 1 of 2007 and October 15 of 2007. Diagnosis of acute cholecystitis and/or biliary colic was made in 112 patients. (A total of 18,849 patients arrived in ER during this time period). A questionnaire comprised from 26 open- and closed-type questions, designed by our research team, was administered to the patients. All questionnaires were answered (100%).

### Statistical analysis

#### Coding and Process:

Initially, variables were coded according to their order of appearance in the questionnaire. According to the requirements of analysis, derivative variables were also created. Descriptive statistics was applied and frequency tables for the epidemiologic and nosological characteristics of the sample were constructed. Student's t- test and chi-square test were used for comparisons among quantitative and qualitative data, respectively, and Yates correction was used for 2x2 contingency tables. Statistical significance was set to

**TABLE 1. Demographic features of the participants**

Sex	N	%	Mean± SD
Men	51	[45.5%]	
Women	61	[54.5%]	
<b>Age</b>		<b>63,7 ± 16,5</b>	
<b>Place of residence</b>			
Larissa	75	[67%]	
Rest of Thessaly	28	[25%]	
Out of Thessaly	4	[3.6%]	
<b>Educational level</b>			
Junior High School	89	[84.7%]	
High School	11	[10.5%]	
University/Technical institute	5	[4.8%]	

**TABLE 2. Age difference between men and women**

	N	Age (Mean ± SD)
Men	51	60.7 ± 15.8
Women	61	67.3 ± 16.8
P < 0.05		t-test

0,05. Analyses were performed by SPSS for Windows, version 13.0.

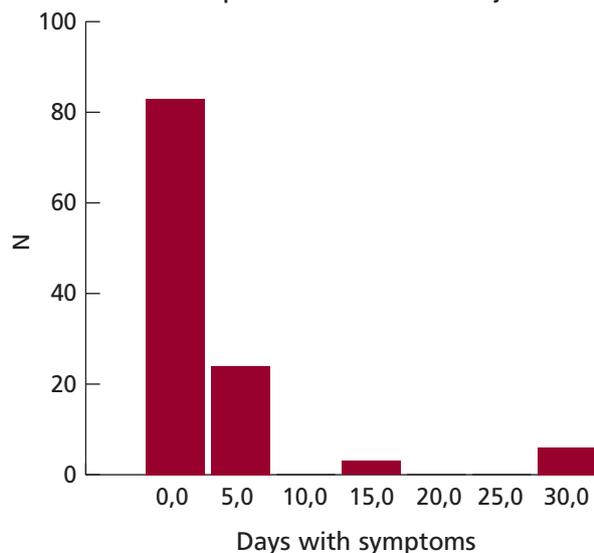
### RESULTS

The percentage of patients with diagnosis of acute cholecystitis that were finally admitted to the hospital was 0.6% of the total of patients arrived in this time period. Demographic characteristics of the patients who participated in the study are shown in Table 1. The majority of them were women of older age, residents of Larissa. They were mainly graduates of elementary school (Table 1). A statistically significant difference regarding age was found between men and women, with women being older than men by one decade on average (Table 2). Symptoms had started during the 5 last days prior to their ER visit, almost in all of the patients - Fig. 1. The majority of patients was presented with the so-called biliary colic, with leukocytosis and rise in lactate dehydrogenase values (LDH). All patients reported pain during their examination in the ER (Table 3). Most patients with a relevant diagnosis had already been undergone an ultrasonography in the past, as well as biochemical testing, in a percentage that was significantly different from the respective percentage of those not having

**TABLE 3. Clinical and laboratory features of patients with cholecystopathy**

Diagnosis	N	(%)
Colic	62/112	[54.9%]
Cholecystitis	50/112	[44.2%]
<b>Previous Diagnosis</b>	<b>35 /112</b>	<b>[31%]</b>
<i>Previous laboratory testing</i>		
Biochemical	26/35	[74.2%]
Ultrasound	30/35	[85.7%]
<b>Current laboratory findings</b>		
Leucocyte count	59/112	[52.7%]
AST	39/112	[34.8%]
ALT	47/112	[42%]
LDH	72/112	[64,3%]
Direct Hyperbilirubinemia	38/112	[33.9%]

**FIG 1.** Duration of symptoms until patients visit to ER (days)



such a diagnosis (table 4). Doctor's offers to the patients diagnosed with "right upper abdominal quadrant attack" and cholelithiasis included hospitalisation in most cases, combination of medication and diet, and diet only in 8 cases. Choledocholithiasis was found in few patients. Almost half of the patients had thickening and oedema of the gallbladder wall, with or without lithiasis. Presence of biliary sludge was found in about 18% of cases (Table 7). After their evaluation in the ER, most patients were admitted in the surgical department (Table 8). Thence, either they underwent surgery, or they were discharged after hospitalisation. Only one patient left ER only with directions. Data are shown in Table 9.

## DISCUSSION

### Epidemiology

Cholelithiasis is among the commonest health conditions requiring surgical intervention. Its total prevalence in USA is estimated at 10-15%. According to epidemiological studies in Europe, the prevalence

**TABLE 4.** Previous diagnosis and ultrasound testing in history

Ultrasound testing in the past			
Diagnosis in history	Yes	No	Total
Yes	29	6	35
No	1	76	77
Total	30	82	112
P < 0.05			X <sup>2</sup>

**TABLE 5.** Previous diagnosis and biochemical testing in history

Biochemical testing in history			
Diagnosis in history	Yes	No	Total
Yes	24	11	35
No	2	75	77
Total	26	86	112
P < 0.05			X <sup>2</sup>

ranges from 5,8% in Mediterranean countries to 21% in Norway (Schirmer 2005). It has been shown that the presence of stones in gallbladder increases with age. It is calculated that 20% of adults above 40 and 30% above 70 years of age, respectively, have gallstones (Schirmer 2005). The prevalence is generally estimated at 18,8% in women and 9,5% in men at the age of 30-69 years. Greek studies are consisted with the finding than in older ages the prevalence of gallstones is considerably increased, as well as with the numbers for morbidity and risks of complications (Papadopoulos 2006, Gourgiotis 2007). Prevalence differs by sex; during reproductive age, the ratio between men and women is ~1:4, while in older age, the ratio is roughly similar (Schirmer 2005, Barbara 1987). In the present study, the proportion of individuals with cholelithiasis requiring hospitalization reached 6 per thousand.

### Clinical presentation of cholelithiasis

Despite many efforts to clarify the clinical presentations of cholelithiasis, the issue remains still open, while existence of specific symptoms is disputed (Schofield 1986, Gruber 1996, Yusoff 2003). Gallstones do not often cause symptoms, and sufferers usually ignore their existence.

In the present study it was found that the commonest symptom in all patients was pain. In a study from Italy including 30,000 individuals aged 30-60 years, it was found that epigastralgia and upper right quadrant pain, combined with intolerance to certain foods (e.g. fried or fatty foods) were positively related to the presence of gallstones. Several additional

**TABLE 6.** Type of advise

Advise	N
Hospitalization	19 (54.3%)
Medical treatment	1 (2.8%)
Combination of medical treatment and diet	7 (20.0%)
Diet only	8 (22.9%)
Total	35 (100.0%)

**TABLE 7. U/S findings of the patients (in hospital examination)**

Findings	N	(%)
Cholelithiasis	37/112	33.0%
«Sludge»	20/112	17.9%
Thickening and oedema with lithiasis/sludge	51/112	45.5%
Choledocholithiasis	4/112	3.6%
Pancreatitis*	2 /112	1.7%

\* *Independently of other findings*

characteristics of pain were confirmed in that study. These were pain radiation to the right shoulder, pain onset immediately after meal, absence of relief with intestinal mobilisation etc. (Festi 1999). Nevertheless, relation of pain with the presence of gallstones is disputed. It has been found that 61% of patients with cholelithiasis, as well as 45% of patients without lithiasis may report biliary colic. These findings show that neither gallstones exclusively responsible for the symptoms nor symptoms are always eased with removal of the former. The proportion of patients reporting lack of relief of their symptoms after cholecystectomy ranges from 6 to 27%, and not painful symptoms persist in 45% (Berger 2004).

#### Laboratory investigation

The method of first choice for gallstones detection is ultrasonography (U/S). It has a sensitivity and diagnostic accuracy of 90-95%. Endoscopic sonography sensitivity reaches 92% for cholelithiasis (Bortoff 2000). Ultrasonography is considered necessary for establishing diagnosis in order to proceed with therapeutic management. In the present study, only 6 patients with diagnosis of cholelithiasis had not already undergone an U/S. Twenty three percent of the sample had undergone biochemical testing, and 11 among those already diagnosed (31%) had not undergone biochemical testing. Ultrasonography is internationally recognised as prerequisite for cholelithiasis diagnosis. However, despite existence

**TABLE 8. Department of admission**

Department	N	%
Internal medicine	3	2.7
Gastroenterology	7	6.3
<b>Surgical</b>	<b>100</b>	<b>89.3</b>
Discharge after evaluation in ER	2	1.8
Total	112	100

of symptoms that cause suspicions of cholelithiasis, many false positive and false negative results exist, influencing sensitivity and specificity of physical examination and medical history in this disease entity, as it is proved by U/S (Connor 1998). In another study, general practitioners (GPs) were asked to complete a questionnaire before and after their U/S. Those who were found to suffer from cholelithiasis and in whom clinical suspicion of cholelithiasis had been arisen were defined as patients with expected gallstones. Those who were found to have cholelithiasis, but the doctor of primary care had not such a suspicion were defined as patients without expected gallstones. Gallstones were detected in 29% of those that presented with clinical suspicion and in 11% of those having no clear clinical picture. Patients with gallstones were mainly women, had symptoms (mainly pain) and had been referred to a specialized doctor. Patients with unexpected findings were mostly men, with less complaints of right upper quadrant pain and they did not have a history of cholecystectomy (Speets 2007). In the present study gallbladder sludge was detected in about 18% of patients, and stones in 33%. All patients had findings in U/S, mostly thickening and oedema of gallbladder wall.

#### Surgical treatment

Eventually only 20-30% of individuals with cholelithiasis will need surgical treatment in their lifetime, implying that cholelithiasis could be considered as a benign condition (Gupta 2004). Evaluation of the history of individuals with cholelithiasis in multiethnic studies shows that 20-35% of those diagnosed with untreated cholelithiasis will develop a complication (Schirmer 2005, Mulvihill 1994). Although general principles of cholelithiasis treatment remain unchanged, surgical methods did change. Laparoscopic surgery and ERCP play an important role in the treatment of cholelithiasis (Robertson 1998, Mulvihill 1994). In the present study, the majority of patients underwent laparoscopic cholecystectomy. The laparoscopic method is safe. The risk of iatrogenic biliary duct

**TABLE 9. Hospitalization and type of surgical procedure**

Total number of patients (N)	112
Hospitalized	107 (96%)
Surgical treatment	78 (73%)
Laparoscopic cholecystectomy	66 (59%)
Hospitalization, discharge and surgery scheduled	14 (12.5%)
No Hospitalization, surgery scheduled	4 (3.6%)
No Hospitalization (instructions only)	1 (0.9%)

traumatisation is reduced if a careful resection is made (Karvonen 2007). The method seems superior to the conventional methods in terms of rapid return to work and rapid mobilisation. It is considered as the method of choice for acute cholecystitis. (Gourgiotis 2007, Somasekar 2002, Liguori 2003). The main advantages of this method are: avoidance of surgical traumatisation, less invasive, reduced time of hospitalisation, less postoperative pain, lower cost, more rapid recovery, better aesthetic result, fast return to daily activities (Liguori 2003, Lublin 2004, Aspevik 2005). The progress in diagnostic and surgical strategies longitudinally has led to reduction of mortality in Greece, despite increase in admissions for cholecystopathy. (Papadopoulos 2006)

### CONCLUSIONS

Pain is the main symptom of patients presenting at general hospitals with the indication of "right upper quadrant attack". Most of the patients have positive U/S findings at the same time. The treatment is surgical, with laparoscopic surgery being the method of choice in most cases. Old women constitute the majority of patients. A thorough investigation in primary health setting contributes to the proper therapeutic decisions and avoidance of complications. A full laboratory investigation is necessary. Technological advances in surgical interventions is expected to minimise discomfort of patients with lithiasis of gallbladder, in the future.

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