

## Assessment of the Relationship between Hyperlipoproteinemias and Biliary Lithiasis

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**Abstract:** *Aim:* The purpose of this study was to bring new data regarding the prevalence of biliary lithiasis in Cluj district in regards to the role of hyperlipoproteinemias as a risk factor for this pathology. *Material and Method:* A clinical study that included 800 adult subjects with age between 18 and 90 was conducted. For each subject an ultrasonographical screening was performed in order to detect biliary lithiasis. The subjects were separated in two subgroups: lithiasic and nonlithiasic. The serum lipids were also determined to all subjects: total cholesterol, tryglicerides, HDL-cholesterol. The levels of serum lipids in the lithiasic and nonlithiasic subgroups were compared. *Results:* The results showed a higher level of total cholesterol (216.7mg/100ml > 187.6mg/100ml) and triglycerides (203.5mg/100ml > 172.4mg/100ml) in lithiasic subgroup; while the HDL-cholesterol was lower (43.7mg/100ml < 46.2mg/100ml). Comparing the results on both sexes, cholesterol and triglycerides proved to be more elevated in men subgroup, while HDL-cholesterol was smaller in women subgroup. *Conclusion:* The results lead to the conclusion that in studied area hyperlipoproteinemias are a major risk factor for biliary lithiasis in both sexes.

**Keywords:** Hyperlipoproteinemias; Biliary lithiasis.

### Introduction

Hyperlipoproteinemias are much-debated risk factors for cholesterolic lithiasis [1-7].

The connection between biliary lithiasis and plasmatic lipids is obvious in cholesterolic stones with a direct relation between the serum level of LDL cholesterol and the biliary saturation in cholesterol [7-10]. Also the low level of HDL- cholesterol is correlated with a high risk of biliary lithiasis [7,8,10].

The purpose of this study was to evaluate the relation between serum lipids and biliary lithiasis.

### Material and Method

The target of the study was the adult population of both sexes. The study took place at the Military Hospital, Cluj-Napoca, April 2006 - September 2007. The subjects included in the study were those who came to the Internal Medicine Department for examination. We included in our study 800 non-selected subjects from all social categories with age between 18 and 90, 426 women and 374 men.

The ultrasonographical screening was performed to all subjects in order to detect biliary lithiasis. The screening was done by two examiners using a General Electric Ecograph with a 3.5 Mhz convex ultrasound transducer. The 800 subjects group was divided in two subgroups after performing abdominal ultrasonography: lithiasic and non-lithiasic subgroups.

The following paraclinical examinations have also been performed to all subjects: total cholesterol, triglycerides, HDL-cholesterol. The following values were considered normal:

- Total cholesterol < 220 mg/100 ml serum

- Triglycerides <160 mg/100 ml serum
- HDL cholesterol > 40 mg/100 ml serum

We compared the level of serum lipids in the lithiasic and nonlithiasic subgroups.

**Results**

The 800 non-selected subjects, 426 women and 374 men, were separated in lithiasic and non-lithiasic subgroups after performing abdominal ultrasonography (Table 1). The percent of women with biliary lithiasis (13.62%) proved not to be statistically significant (p = 0.1683) compared to percent of men with biliary lithiasis (10.43%)

**Table 1.** The frequency of biliary lithiasis in studied groups

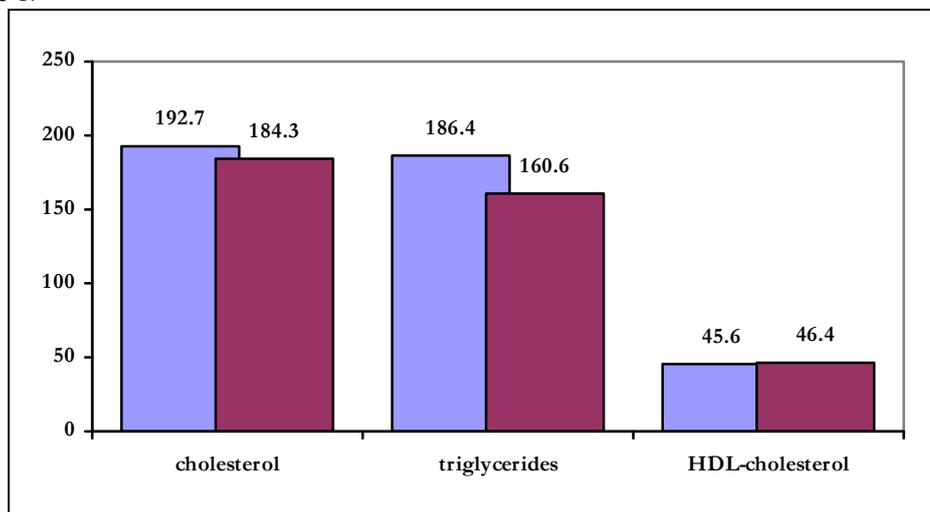
Group	Total	Biliary Lithiasis	Without Biliary Lithiasis
Women	426	58	368
Men	374	39	335
Total	800	97	703

The average value of serum lipids in lithiasic and nonlithiasic subgroups is represented in Table 2.

**Table 2.** The average and standard deviation value of serum lipids in lithiasic and nonlithiasic subgroups

Group	Average		
	Total Cholesterol	Triglycerides	HDL- cholesterol
Biliary Lithiasis (n = 97)	216.7	203.5	43.7
Without Biliary Lithiasis (n = 703)	187.6	172.4	46.2

In the lithiasic and nonlithiasic women subgroups we have the results for serum lipids presented in Figure 1.



**Figure 1.** The average value of serum lipids in lithiasic and nonlithiasic women subgroups  
In men subgroups the average values of serum lipids are represented in Figure 2.

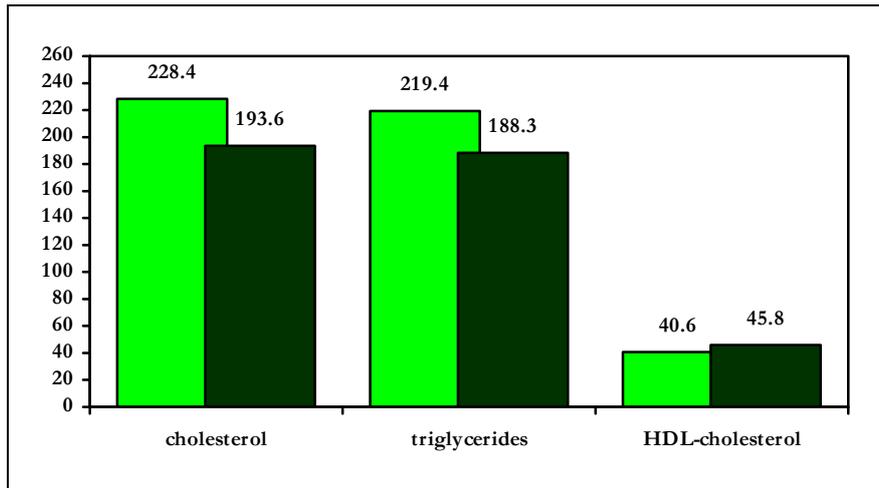


Figure 2. The average value of serum lipids in lithiasic and nonlithiasic men subgroups

## Discussion

The role of hyperlipoproteinemias in the pathogenesis of biliary lithiasis was very much debated. There were a lot of studies which showed that dyslipidemia is more frequent in lithiasic subjects comparing with those nonlithiasic [4,6-9].

In cholesterolic lithiasis the index of saturation of biliary cholesterol is connected with the level of serum lipids. A positive correlation between the seric level of LDL-cholesterol and the biliary saturation in cholesterol was proved [6,8].

From all types of hyperlipoproteinemias the prevalence of cholesterolic lithiasis is higher in types IIb and IV [3,9,10]. These seem to have common metabolic characteristics suggested both by the increase cholesterol saturation of the bile and the efficiency of chenodeoxicolic acid treatment, which decreases the serum VLDL and biliary saturation in cholesterol [9,10].

Our study revealed a positive relation between the serum level of cholesterol and biliary lithiasis. In our group the serum level of cholesterol was higher in lithiasic subjects comparing with those nonlithiasic (216.7mg/100ml > 187.6mg/ml). Also, the value of serum triglycerides was higher in lithiasic subgroup (203.5mg/100ml > 172.4mg/100ml) while the HDL-cholesterol was smaller in lithiasic subjects comparing with those nonlithiasic (43.7mg/100ml < 46.2mg/100ml). These results mentain in both sexes with the mention that cholesterol and triglycerides were more elevated in men subgroup, while HDL-cholesterol was smaller in women subgroup.

It is known that in cholesterolic biliary lithiasis the saturation index of biliary cholesterol is connected with serum lipids [1,3,6,8,11,12]. The increased saturation index of biliary cholesterol leads to an increased precipitation in bile [4,6,9,11] and finally to the appearance of biliary lithiasis.

The increased level of cholesterol and triglycerides in our lithiasic subgroup confirms the important lithogen role of hyperlipoproteinemias.

## Conclusions

In lithiasic subjects the serum level of cholesterol was significantly higher comparing with nonlithiasic subjects (216.7mg/100ml > 187.6mg/100ml)

The serum value of triglycerides was also higher in lithiasic subgroup (203.5mg/100ml > 172.4mg/100ml)

Serum HDL-cholesterol was lower in lithiasic subgroup comparing with nonlithiasic subgroup (43.7mg/100ml < 46.2mg/100ml)

The increased value of total cholesterol and triglycerides associated with a decreased value of HDL-cholesterol maintained in both feminine and masculine sexes.

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