Original Article

Surgery

Altered Lipid Profile in Patients with Gallstones admitted for Cholecystectomy

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ABSTRACT

Background: The cholesterol content is important in classifying gallstones as either cholesterol or pigment stones. Most of the gallstones are cholesterol stones. There is a multifactorial and complex relationship between blood cholesterol, Low Density Lipoprotein, and High Density Lipoprotein levels and cholesterol gallstone formation. Evidence showed that more than half of patients with gallstones have altered serum lipids which are a risk factor for ischemic heart diseases.

Objective: This study was done to find out frequency of altered lipid profile in patients with gallstones admitted for cholecystectomy at Dow University Hospital Karachi Pakistan.

Study Design: case series study.

Place and Duration of Study: This study was conducted at the Surgical Unit-2, Dow University Hospital, OJHA Campus, Karachi for a period of 14 months from January 2012 to March 2013.

Materials and Methods: All diagnosed patients of cholelithiasis were included in this case series study. Lipid profile was performed for all patients before performing cholecystectomy. Post operatively gallbladder specimens were sent for histopathology and stones for chemical analysis.

Results: A total number of 45 patients were included in this study, out of which 40 were female. The mean age of patients was 47.7 ± 13.3 years. On chemical analysis, Cholesterol was found in all of the stones. The histopathology of all patients showed chronic cholecystitis. The total mean serum cholesterol level was 199.3 ± 36.8 , HDL cholesterol was 43.5 ± 7.7, LDL ± 23.9 cholesterol was 127.2 ± 23.9, and triglycerides were 139.1 ± 37.5. Serum total cholesterol was elevated in 28/45 patients (62.2%), LDL cholesterol was elevated in 26/45 (57.7%), triglycerides elevated in 18/45(40.0 %,) whereas HDL cholesterol was below normal in 16/45 (35.5%) of patients.

Conclusion: Most of the patients operated for Lap Cholecystectomy had altered lipid profile. Patients presenting with Cholelithiasis should be investigated for altered lipid profile, which is a major risk factor for developing cardiovascular disease if left untreated.

Key words: Gallstones, Cholecystectomy, Cholesterol, Serum Lipids

INTRODUCTION

Gallstone disease is one of the commonest diseases seen in surgical clinical practice. Prevalence of cholelithiasis in population varies globally. Some studies have proven that the prevalence of gallstones is 10–15% in western countries, and is 3–5% in African and Asian population[1]. The chief constituents of gallstones are cholesterol, bilirubin, and calcium.[2] The cholesterol content is important in classifying gallstones as either cholesterol or pigment stones, and most gallstones are made of mixed content, whereas pure stones are uncommon. The stones with higher than 50% cholesterol content are known as cholesterol stones, and 70% to 80% of gallstones are cholesterol stones [3,4,].The relationship between blood cholesterol, LDL, and HDL levels and cholesterol gallstone formation is multifactorial and complex. Factors commonly associated are cholesterol hyper- secretion and super-saturation, bile salts and phospholipid concentrations, gallbladder dysmotility, absorption and secretory functions and crystal nucleation.[3,5]

It is a common practice that full metabolic assessment is done in patients with kidney stones in our community but very less physicians think to practice this in patients presenting with gallstones. Evidence dating back over 30 years, shows that more than half of patients with gallstones have an associated lipid disorder and the altered serum lipids is one of the risk factor to develop ischemic heart diseases.[6] Studies have been done on different aspects of gallstones diseases but less work has been done of its association with serum lipids,[7] and which in sequence is believed as a risk factor for ischemic heart disease and stroke.[8,9,10] Elevated serum lipid levels associated with cholesterol gallstones are found to be more prevalent in Pakistan.[11]

This study will be useful for detection of associated lipid disorders in patients presenting with gallstones.

There is less number of data available in Pakistan concerning the association between gallstones & altered serum lipid profile, which is a recognized risk factor for coronary heart diseases . This study is one step to generate evidence of association of abnormal lipid profiles and gallstones so that all patients planned for elective cholecystectomy should be evaluated for lipid studies.

MATERIALS AND METHODS

This case series was conducted at the Surgical Unit-2, Dow University Hospital, OJHA Campus for a period of 14 months from January 2012 to March 2013. A total of 45 patients diagnosed as cholelithiasis on ultrasonography were included in the study. All of them routinely had Lipid profile done (with 12-14 hrs. fasting overnight) All of these underwent cholecystectomy either through Laparoscopic or open technique. Post operatively gallbladder specimens were sent for histopathology and stones for chemical analysis. The clinical and laboratory records of the patients were analyzed for age, gender, serum cholesterol, LDL, HDL levels, stone composition, and histopathology reports of gallbladder specimen.

Data was analyzed by SPSS version 17 for descriptive statistics.

RESULTS

A total number of 45 patients were included in this study, out of which 40 (88.8%) were female and 5 (11.1%) were male. The mean age of patients was 47.7 ±13.3 years. All of them were married. All patients had undergone laparoscopic cholecystectomy except for the 3 patients, in which open Cholecystectomy was performed. Stone was green in color in 41.7%, stones brown in color were 29.2% while only 4.2% stones were black.

On chemical analysis, Cholesterol was the principal constituent found in all of the stones, while calcium, bilirubin and bicarbonate were absent. The size of the stone varied between 0.2 to 1.7cm, while the mean stone size was found to be 1.01 cm ± 0.38 SD. The histopathology of all patients showed chronic cholecystitis except for the one patient who had xanthomatous granulomatosis. The mean values of total cholesterol level was 199.3±36.8, HDL cholesterol was 43.5±7.7, LDL cholesterol was 127.28 ± 23.9 and triglycerides was 139.1 ± 37.5, shown in Table-I.

Table No.I: Lipid profile of patients before undergoing cholecystectomy

Parameters	Values found in patients Mean ± SD	Abnormal results n/45 (%)	Standard normal value mg/dL
Total cholesterol mg/dl	199.3 ± 36.80	28 (62.2)	<200
HDL Cholesterol mg/dl	43.5 ± 7.74	16 (35.5)	>40
LDL Cholesterol mg/dl	127.28 ± 23.95	26 (57.7)	<130
Triglycerides mg/dl	139.1 ± 37.51	18(40.0)	<150

Serum total cholesterol was elevated in 28/45 patients (62.2%), LDL cholesterol was elevated in 26/45 (57.7%), triglycerides elevated in 18/45(40.0 %,) whereas HDL cholesterol was below normal in 16/45 (35.5%) of patients (Table-I).

DISCUSSION

Serum lipids have an important role in the etiology of cholelithiasis and in particular cholesterol gallstones are commonly associated with altered serum lipids. The altered serum lipids implicated include , high serum triglycerides, total cholesterol, LDL cholesterol, and low HDL cholesterol [12] This study was undertaken to find out and observe possible relationship between altered serum lipids in patients presenting with gallstones.

In our study, all the 45 patients of which 40 (88.8%) were female and 5 (11.1%) were male ,predominantly had cholesterol gallstones (100%), whereas mixed stones being absent as none of them had any sign of pigment in them, which is comparable to the study by Olokoba AB[2] who has mentioned that cholesterol is the principal constituent comprising 70 to 98% of gallstones and also consistent to the local study by Channa NA,[11] who reports that pure cholesterol stones are more common in Pakistan.

Serum total cholesterol was elevated in 62.2% in this study, LDL Cholesterol elevated in 57.7%, Triglycerides elevated in 40% and HDL cholesterol was below normal in 35.5% of patients, which are consistent and comparable with other previous studies. [2,3,6,11,,14,16,17,19,20] These suggesting positive association between gallstone disease and elevated serum total cholesterol, LDL cholesterol, Triglycerides and decreased serum HDL cholesterol levels.

Studies by Volzke[7] and Mohr[15] reported an inverse relationship between low LDL cholesterol and risk of gallstone disease, which was unexpected and not consistent with findings of our study and other previous studies mentioned above.

Though most studies have mentioned association of altered serum lipid levels with gallstone disease, but very few studies have been done on estimation of all risk factors associated with gallstones and cardiac diseases.[15] The association of gallstones to altered lipids has also been reported in our study, so there may also be a positive effect of lipid lowering drugs to lower down cholesterol component of gallstones [16,17,], which has not been discussed in our study. If evaluation of composition of bile especially the cholesterol level in it is also done, as mentioned in some other studies, it would be more authentic to see the effect of lipid lowering drugs in future[18].

All patients diagnosed with gallstones and planned for cholecystectomy should be considered as high risk for cardiovascular diseases. They must have a fasting lipid profile done as a routine part of their preoperative

clinical assessment, as majority will have altered lipid profile which could increase the risk of developing cardiovascular disease if left untreated.

CONCLUSION

Most of the patients operated for Lap Cholecystectomy had altered lipid profile. Patients presenting with Cholelithiasis should be investigated for altered lipid profile, which is a major risk factor for developing cardiovascular disease if left untreated.

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