ORIGINAL RESEARCH

Comparative analysis of serum lipid profiles in patients with and without gallstones: A Biochemical study

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ABSTRACT
Aims- To explore alterations in lipid profiles following cholecystectomy in patients with gallstones and without gall stones. **Materials and methods-**A total of 25 patients meeting the inclusion criteria were enrolled in the study, while 25 inpatients without a history of gallstones served as the control group. Both male and female patients aged between 18 and 50 years who had been diagnosed with gallstone disease were included.Statistical analysis was conducted using SPSS. **Results-** The analysis revealed that although the patients had higher serum cholesterol levels compared to the controls, this difference was not deemed statistically significant. **Conclusion-** The study findings led to the conclusion that both serum triglyceride levels and serum HDL levels exhibited statistical significance in patients with gallstone disease.
Keywords-gallstone, lipid, cholesterol

INTRODUCTION

Gallstone disease is a prevalent gastrointestinal condition with a global impact, posing a significant burden on healthcare systems. This chronic hepatobiliary disorder is characterized by the formation of gallstones in the hepatic bile duct, common bile duct, or gallbladder and may stem from disturbances in cholesterol, bilirubin, and bile acid metabolism. Research has consistently linked gallstones to abnormalities in lipid profiles.[1, 2]

Individuals with gallstones often experience intense abdominal pain, prompting the need for medical evaluation and intervention. Surgical removal of the gallbladder, a common treatment approach for symptomatic cases, alters the flow of bile from the liver directly into the upper intestine.[3, 4] This change accelerates the circulation of bile acids, impacting the enterohepatic system and its interactions with lipids and bile acids.[5]Despite the interconnected nature of lipid and bile acid metabolism, the specific effects of gallbladder removal on lipid profiles remain incompletely understood. Hence, the research aims to explore alterations in lipid profiles following cholecystectomy in patients with gallstones and without gall stones.

MATERIALS AND METHODS

A total of 25 patients meeting the inclusion criteria were enrolled in the study, while 25 inpatients without a history of gallstones served as the control group. Both male and female patients aged between 18 and 50 years who had been diagnosed with gallstone disease were included. Gallstones were identified using ultrasound. Patients with acalculous gallbladder disease on ultrasound, a history of terminal ileal resection, hemolytic disorders, liver cirrhosis, and those taking antihyperlipidemic medications were excluded from the study. Ethical approval was obtained from the hospital's ethical committee, and written informed consent was obtained from all participants. Blood samples were collected from both patients and controls to analyze their serum cholesterol, triglycerides, LDL, and HDL levels. The results were documented, and the data were presented as mean values with standard deviations. Statistical analysis was conducted using SPSS.

RESULTS

The study included a total of 50 participants, split evenly between 25 patients and 25 controls. The average age of the patients was 42.8 years, while that of the controls was 39.12 years. The analysis revealed

that although the patients had higher serum cholesterol levels compared to the controls, this difference was not deemed statistically significant. In contrast, patients exhibited elevated serum triglyceride levels in comparison to controls, and this disparity was statistically significant.

Table 1 Showing means of lipid profile in disease and controls.

Lipid parameters	Disease mean	Group control mean	P value
Cholesterol (mg/dL)	186.20	180.95	0.211
Triglycerides (mg/dL)	176.91	152.32	0.002*
LDL (mg/dL)	121.45	128.54	0.052
HDL (mg/dL)	30.54	45.90	0.410

***: Significant**

DISCUSSION

Around half of the patients of cholilithiasis have abnormal lipid profile. This increases the incidence of coronary artery disease (CAD) and stroke.[6, 7] Recent studies have shown that hypertriglyceridemia, hypercholesterolemia, and low level of HDL-C are commonly associated with cholilithiasis. It is a well-known fact that this association can further lead to CAD and stroke.[8, 9] In the present study, the mean levels of TC, TGs, and VLDL-C were significantly elevated in patients with cholelithiasis as compared to controls, while there was the insignificant difference for LDL-C and HDL-C levels.

The study included a total of 50 participants, split evenly between 25 patients and 25 controls. The average age of the patients was 42.8 years, while that of the controls was 39.12 years. The analysis revealed that although the patients had higher serum cholesterol levels compared to the controls, this difference was not deemed statistically significant. In contrast, patients exhibited elevated serum triglyceride levels in comparison to controls, and this disparity was statistically significant.In a previous study conducted by Aulakh R et al, authors compared serum lipid profile and gallstone disease. The age range of 200 cases was 13 to 77 years with a mean of43.75 +/- 13.39 years. There were 171 females (85.5%) and 29 males (14.5%) with male to female ratio of 1: 5.8. The stones containing both cholesterol and bile pigments were the most common (129 cases, 84.87%); while pure cholesterol stones were seen in 23 cases (11.50%) and pigment stones were infrequent (1 case, 0.65%). On lipidogram of patients in the study group, mean serum total cholesterol was 155.50 +/- 43.03 mg/dL, mean serum triglycerides was 100.49 +/- 45.23 mg/dL, mean HDL cholesterol was 46.71 +/- 15.20 mg/dL, mean LDL cholesterol was 87.94 +/- 36.85 mg/dL and mean VLDL cholesterol was 20.84 +/- 11.97 mg/dL. Serum total cholesterol values were significantly higher in patients older than 39 years as compared to patients < or =39 years (161.44 +/- 42.32 mg/dL vs. 145.79 +/- 32.96 mg/dL, $p < 0.05$). But the observed mean values in both of these subgroups were within the normal range i.e. <200 mg/dL. No significant difference was observed in the mean serum triglyceride values between male and female patients.[10]Hayat S, et al compared serum lipid profile of gallstone patients with the controls.A total of 50 patients were included in the study after screening through the inclusion criteria. A control group of 50 inpatients with no personal or family history of gallstones were also recruited for comparison. Results were expressed as mean with standard deviation. The mean age of the patients was 40.90 years and that of controls was 34.74 years. 46 patients were females and 44 controls were females. The serum cholesterol levels were high in the patients as compared to the controls but the comparison was not statistically significant. Serum triglycerides levels were high in the patients as compared to the controls and the analysis was statistically significant. Furthermore, the serum HDL levels were low in the patients as compared to the controls with a statistically significant p-value. However, the serum LDL levels were low in the patients as compared to the control group.It was concluded that serum triglyceride levels and serum HDL levels were statistically significant in gallstone patients and there was a positive correlation between these parameters and gallstone disease.[11]

CONCLUSION

The study findings led to the conclusion that both serum triglyceride levels and serum HDL levels exhibited statistical significance in patients with gallstone disease. These parameters showed a clear positive correlation with the occurrence of gallstones.

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