Section: General Surgery

Original Research Article

# STUDY OF GALLBLADDER LESIONS AND IT'S RELATIONSHIP WITH SERUM LIPID PROFILE: A HOSPITAL BASED RETROSPECTIVE STUDY

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***Received*** *: 09/07/2024*
***Received in revised form*** *: 20/08/2024*
***Accepted*** *: 26/08/2024*

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**DOI:**10.70034/ijmedph.2024.3.112

**Source of Support:** Nil,
**Conflict of Interest:** None declared

**Int J Med Pub Health**
2024; 14 (3); 625-628

## ABSTRACT

**Background:** Several studies have found a connection between gallstones and unhealthy blood fats. These unhealthy fats can raise the risk of heart problems and strokes. This research examines how common unhealthy blood fats are in people who have had their gallbladders removed.

**Materials and Methods:** We conducted a retrospective analysis of the lipid profiles of 121 patients who underwent cholecystectomy in our department between January 2023 and December 2023. Sociodemographic details and preoperative lipid profile results were obtained from patient information records.

**Results:** Of the 121 patients, 78 (64.5%) were females, and 43 (35.5%) were males. In this study, total cholesterol levels were 172.5 ± 41.94 mg/dl, triglyceride (TG) 165.1 ± 114.06 mg/dl, low-density lipoprotein cholesterol (LDL-c) 110 ± 42.67 mg/dl, and high-density lipoprotein cholesterol (HDL-c) 46.8 ± 12.82 mg/dl. Of the total cases, 102 (84%) presented abnormal lipid values (dyslipidemia), while the remaining 19 patients (15%) had normal lipid profiles. Among the total cases,65.3% of the patients exhibited hypercholesterolemia (values > 200 mg/dl), 72% had hypertriglyceridemia (> 150 mg/dl), 56.2% displayed high levels of LDL-c (> 130 mg/dl), and 36.4% had low levels of HDL-c (< 50 mg/dl).High levels of LDL-c were most commonly observed in male patients (p-value < 0.0001).

**Conclusion:** Patients who have undergone a cholecystectomy or have a history of gallstones should have a complete fasting lipid profile, including HDL and LDL cholesterol levels, as a significant proportion will exhibit abnormal results. Current guidelines suggest that these individuals are at an increased risk of cardiovascular disease and should receive appropriate treatment.

**Keywords:** Lipidprofile, Cholecystectomy, Hyperlipidaemia, Gallstones, Hypercholesterolemia, Hypertriglyceridaemia.

## INTRODUCTION

People with kidney stones usually have tests to check for underlying problems that cause them. However, this isn't always done for people with gallstones. Even though studies from many years ago showed that more than half of people with gallstones have problems with their blood fats, this important connection is often forgotten. [1] High levels of unhealthy blood fats can greatly increase the risk of heart disease and stroke. [2] According to national guidelines, cholesterol levels should generally be lower than 5 mmol/L, and LDL cholesterol should be lower than 3 mmol/L for people at high risk of heart disease.[3] In India, there's been a significant increase in gallbladder

removal surgeries due to the high number of people with gallstones.[4]

Recent research has shown that high triglycerides, low HDL cholesterol, and high cholesterol are often found together in people. [5] These are all risk factors for heart disease and stroke. [6, 7] There is no recent Indian data to guide current medical practice. This study looks back at the records of people who had their gallbladders removed to see how common these lipid problems were. It also follows people with gallstones to find out how many of them are at risk for heart or stroke problems.

## MATERIAL AND METHODS

In this hospital-based retrospective study, we conducted a subsequent prospective analysis of patients who had undergone cholecystectomy. We obtained the details of all patients who had a cholecystectomy performed from January 2023 to December 2023.

The study included people over 18 years old, both men and women, who had their gallbladders, removed using a minimally invasive surgical technique called laparoscopic cholecystectomy. People with incomplete medical records were not included in the study.

We collected information about patients' backgrounds and their blood fat levels before surgery. The basic blood fat tests we looked at were cholesterol and triglycerides. HDL and LDL were only measured if specifically requested and if the patient had fasted. We compared the patient information with their lab results and tissue samples to find patients who had their gallbladders removed and also had blood fat tests. We studied the characteristics of these patients, and we used a statistical test called Chi-square to compare the differences between men and women.

## RESULTS

Retrospective study of 121 the cholecystectomies which were performed, 78 (64.5%) were females and 43 were (35.5%) males. The median age of the females was 51 years (range 23-79) and 56 years (29-81) for males. The average weight in men was 59 ± 11.91 kg and 52.43 ± 12.03 kg for women. Height was 1.68 ± 0.08 m in men and 1.56 ± 0.06 m in women. The BMI in male patients was 27.86 ± 4.0 kg/m2 and 27.92 ± 4.34 kg/m2 in female patients. [Table 1]

In this study, total cholesterol levels were 172.5 ± 41.94 mg/dl, TG 165.1 ± 114.06 mg/dl, LDL-c 110 ± 42.67 mg/dl, and HDL-c 46.8 ± 12.82 mg/dl. Out of the total cases 102 (84%) presented abnormal values of lipids (dyslipidemia) and rest of the patients (19,15%) had normal lipid profile. [Figure 1]

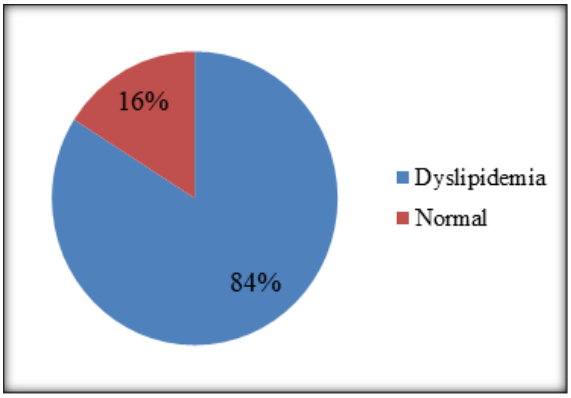


**Figure 1: Lipid profile results of the included cases.**

The study revealed that a majority of the patients exhibited abnormal lipid profiles, with 65.3% having hypercholesterolemia, 72% hypertriglyceridemia, 56.2% elevated c-LDL, and 36.4% low c-HDL. [Table 2]

When the removed gallbladders were examined under a microscope, the most common problem found was chronic inflammation with gallstones (in 82% of cases). Other conditions seen included cholesterol deposits (15%), both acute and chronic inflammation (14.8%), and two rare conditions: xanthogranulomatous cholecystitis and adenocarcinoma. [Figure 2]

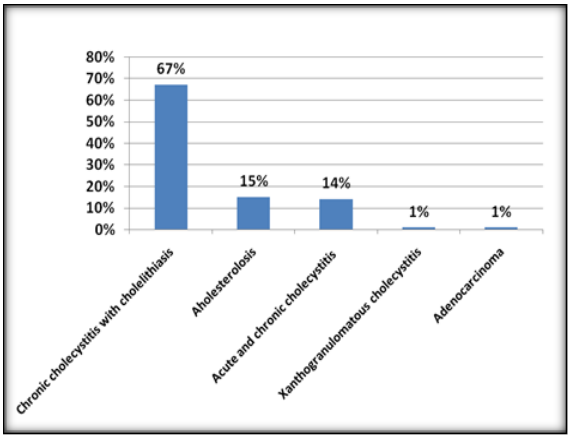


**Figure 2:** Histopathological diagnosis of post-cholecystectomy specimens.

**Table 1: Sociodemographic details of enrolled cholecystectomy cases**

| Demographic Details | | Total (N=121) | |
|---|---|---|---|
| | | n | % |
| Sex | Male | 43 | 35.5 |
| | Female | 78 | 64.5 |
| Age | <50 | 52 | 43.0 |
| | >50 | 69 | 57.0 |
| BMI | ≤18.5 | 13 | 10.7 |
| | 18.5—24.9 | 88 | 72.7 |
| | ≥25.0 | 21 | 17.4 |

**Table 2: Sex-wise distribution of lipid profiles among patients who underwent cholecystectomy**

| Dyslipidemia | Total(N=121) | | Male(N=43) | | Female (N=78) | | P value |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| Hypercholesterolemia | 79 | 65.3 | 26 | 60.5 | 53 | 67.9 | 0.5 |
| Hypertriglyceridemia | 87 | 71.9 | 24 | 55.8 | 33 | 42.3 | 0.1 |
| High levels of LDL | 68 | 56.2 | 36 | 83.7 | 32 | 41.0 | 0.0001 |
| Low levels of HDL | 44 | 36.4 | 27 | 62.8 | 37 | 47.4 | 0.1 |

## DISCUSSION

Routine lipid profile assessments are uncommon in patients undergoing gallbladder surgery, despite evidence linking cholesterol levels to gallstone formation. This study found that only a third of patients had complete lipid data available, primarily obtained through general practitioner records.

Our patient population exhibited notably higher rates of obesity (17%) and overweight (72%) compared to national averages of 39.1% and 36.1%, respectively. Furthermore, a significant proportion of our patients displayed lipid abnormalities, with 65% experiencing high cholesterol, 71% with elevated triglycerides, 56% with high LDL cholesterol, and 36% with low HDL cholesterol.

Women in the retrospective group exhibited a significantly higher prevalence of high cholesterol compared to men. Both men (25%) and women (33%) demonstrated hypertriglyceridemia, a rising concern for heart and diabetes risk. Although men displayed lower HDL levels than women, this difference was less pronounced and limited to the retrospective cohort.[3]

Yaylak et al. conducted one of the largest studies on gallbladder pathology, examining 429 cases. [7] Cholesterolosis was the most prevalent finding (18%), followed by acute cholecystitis (10.7%). Bhatta and Singh reported a smaller cohort of 287 cases, with chronic cholecystitis as the predominant diagnosis (73.3%).[8] Our study, encompassing [number] patients identified chronic cholecystitis as the most common pathology (70%), followed by cholesterols (28%) and acute cholecystitis (7%).[9]

Postoperative patients who underwent cholecystectomy exhibited a notable reduction in blood lipid levels. These lipid changes may substantially influence the risk of developing coronary artery disease in this patient group.[10]

Even though this study only looked at abnormal blood fats, people with gallstones are more likely to have other things that can lead to heart disease, like being overweight. This means their risk of heart problems is even higher. [11] Based on current guidelines, many people with gallstones should probably get treatment for their unhealthy blood fats if they also have other risk factors.[12] In the UK, about 25,000 women and 6,250 men who have had their gallbladders removed have a higher risk of heart disease and stroke if they don't follow the guidelines. If we apply this risk to everyone with gallstones, over 2.7 million women and nearly 690,000 men could be at risk.[13, 14]

## CONCLUSION

Dyslipidemia, characterized by abnormal lipid levels, is strongly linked to gallstone formation and increases the risk of cardiovascular complications in cholecystectomy patients. The underlying mechanisms connecting these conditions require further exploration. To mitigate this risk, early identification and management of dyslipidemia are crucial. Our findings reveal a critical oversight in current practice: gallstones are often treated solely as a surgical issue, neglecting the potential for underlying metabolic disturbances. A paradigm shift is necessary to view gallstones as a symptom of a broader metabolic problem. Comprehensive lipid profile assessments should be standard practice for all patients with gallstones to facilitate early intervention and improve cardiovascular outcomes.

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