

Original Research Article

Study of gallbladder lesions and its relationship with serum lipid profile

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ABSTRACT

Background: Gallbladder disease is one of the most common gastrointestinal diseases. Various studies have shown association between gallstone and alteration in serum lipids. The objective of this study was to evaluate histological patterns of cholecystectomy specimens and compare serum lipid profile of gallstone patients with controls.

Methods: This study was conducted over a period of two years (April 2016 to April 2018). Records of 287 specimens who underwent cholecystectomy were analysed in which gallstones were found only in 186 patients. Out of 186 patients with gallstones, records of serum lipid profile were available in 32 patients which were compared with 32 control of similar age. Independent t- test was used to compare the data between cases and control.

Results: Out of 287 cases, 68 were male and 219 were female with male to female ratio of 1:3.2. The predominant histopathological lesion was chronic cholecystitis (73.17%). Malignancy was observed in 0.7% cases. Serum total cholesterol, triglycerides and low density lipoprotein cholesterol were found to be higher and statistically significant in patients with gallstone compared to controls (p value 0.024, <0.001 and 0.016 respectively). Serum High density lipoprotein cholesterol was lower in gallstone patient than in control but not statistically significant (p value 0.23).

Conclusions: Chronic cholecystitis was the most common histopathological lesion. Serum total cholesterol, triglyceride and low density lipoprotein cholesterol level were elevated and statistically significant in patients with gallstone.

Keywords: Cholecystectomy, Chronic cholecystitis, Gallstones, Histopathology, Serum lipid profile

INTRODUCTION

Gallbladder is a pear shaped organ which is affected by a wide spectrum of pathological lesions including inflammation, infection, benign polyps, premalignant and malignant conditions. Cholelithiasis is most common biliary pathology affecting 10-15% of western population.¹ Risk factors for development of gallstone include female gender, obesity, oral contraceptives, fat rich diet and sedentary lifestyles.² Obesity is associated with linear increase in gallstone formation. It has been suggested that there is altered lipid metabolism in gallstone and serum lipid profile of gallstone patients differ from that of healthy individuals.³

Chronic cholecystitis occurs after repeated episodes of acute cholecystitis and is mostly due to gallstone.⁴ Longstanding gallstone also predisposes to carcinoma of gallbladder.⁵ The risk of developing gallbladder cancer is higher in female than in male.^{6,7} Histopathological examination of cholecystectomy specimens have important role in diagnosis of benign and malignant lesions as it is difficult to diagnose such lesions before surgery.^{8,9} Selective histopathological examination of cholecystectomy specimen is not recommended as it can result in missing premalignant and malignant lesions.¹⁰ The objective of this study was to evaluate histopathological patterns in cholecystectomy specimens and to compare serum lipid profile between patients with cholelithiasis and controls.

METHODS

This was a retrospective study conducted in the departments of Pathology and Biochemistry of KIST Medical College and Teaching Hospital, Lalitpur, Nepal, over a period of two years from April 2016 to April 2018. A total of 287 cholecystectomy specimens of Gallstones were found in 186 patients.

The histopathological records and clinical details were retrieved from computer database. For estimation of serum lipid profile only cases with cholelithiasis were included in the study and cases without gallstone were excluded from the study.

Gallstones were found in 186 patients. Out of 186 patients with cholelithiasis, records of serum lipid profile were available only in 32 patients which were compared with 32 control of similar age. Hospital staffs and healthy individuals who came for routine screening in the outpatient department without gallstone or medical illness affecting lipid profile were included in the control group.

Lipid profile test included estimation of Total Cholesterol, High Density Lipoprotein Cholesterol, Low Density Lipoprotein Cholesterol, Triglycerides. Serum lipid profile was evaluated by Siemens autoanalyzer Dimension RxL MaX. All the variables were presented as number and frequency and were arranged in tables.

Statistical analysis

Data were analyzed using Statistical Package for Social Science (SPSS, version 21) for Windows. Results were expressed as mean±SD. Independent t- test was used to compare the data between cases and control. A p value less than 0.05 was considered statistically significant.

RESULTS

A total of 287 cholecystectomies were analyzed. The age of the patients ranged from 22 years to 76 years. Majority of the patients were female (76.3%), with a male to female ratio of 1:3.2 (Figure 1).

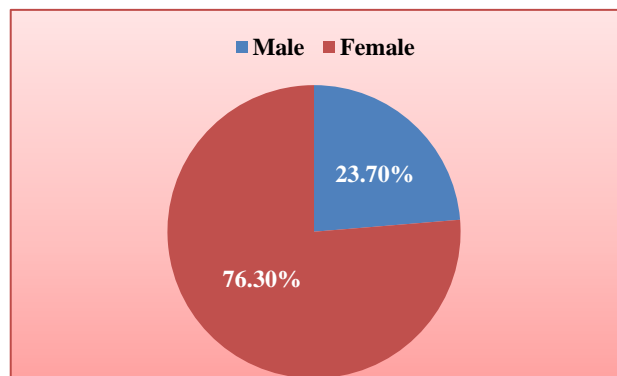


Figure 1: Gender wise distribution of study population.

The histopathological diagnosis of cholecystectomy specimens is shown in Table 1.

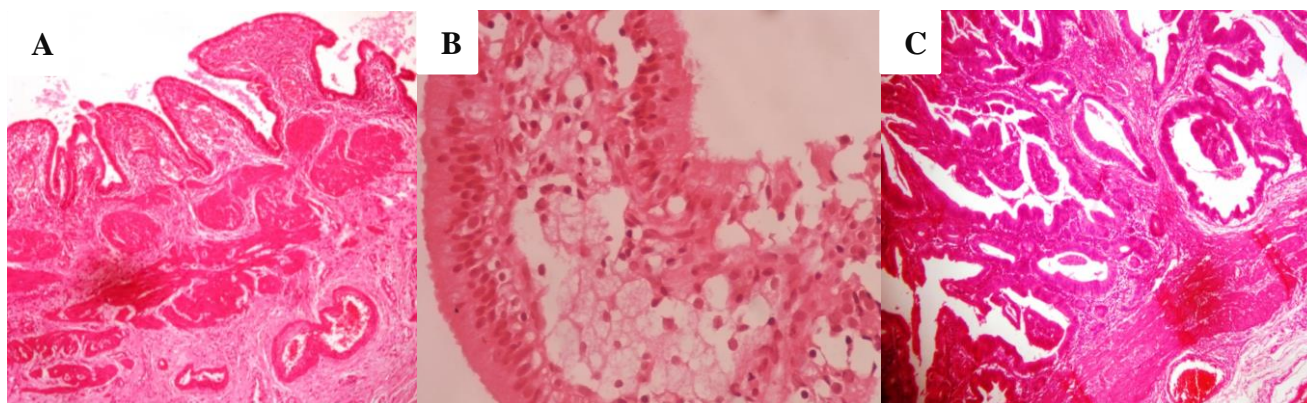


Figure 2: Photomicrograph of chronic cholecystitis; A) Cholesterolosis, B) Adenocarcinoma of gallbladder, C) H and E stain.

Chronic cholecystitis was found to be the most common lesion (73.17%). Gallstone was found in 186 (64.8%) patients out of 287 patients. Cholesterolosis was observed in 9.75% cholecystectomy specimens. Polyp was diagnosed in 5 cases (1.74%), out of which three were cholesterol polyps and two were hyperplastic polyps. Adenocarcinoma was found in 2 cases (0.7%). Both cases occurred in female patients >60 years old. Photomicrograph of Chronic cholecystitis,

Cholesterolosis and Adenocarcinoma of gallbladder is shown in Figure 2.

Serum lipid profile was compared between 32 patients with gallstone disease and controls of similar age. Serum total cholesterol, triglycerides and low density lipoprotein cholesterol (LDL-C) were found to be higher and statistically significant in patients with gallstone

compared to controls (p value 0.024, <0.001 and 0.016 respectively).

Table 1: Histopathological diagnosis of cholecystectomy specimens.

Histopathological diagnosis	Number	Percentage (%)
Chronic cholecystitis	210	73.17
Cholesterolosis	28	9.75
Chronic active cholecystitis	14	4.9
Acute cholecystitis	12	4.18
Chronic follicular cholecystitis	08	2.78
Xanthogranulomatous cholecystitis	04	1.39
Empyema	04	1.39
Polyp	05	1.74
Adenocarcinoma	02	0.7
Total	287	100

Serum High density lipoprotein cholesterol (HDL-C) was lower in gallstone patient than in control but not statistically significant (p value 0.23). The relationship between gallstones with serum lipid profile is shown in Table 2.

Table 2: Relationship of gallstone with serum lipid profile.

Serum lipid profile	Gallstone patients mean \pm SD (mg/dl)	Control mean \pm SD (mg/dl)	P value
Total cholesterol	168.62 \pm 37.90	151.5 \pm 16.72	0.024
Triglycerides	146.71 \pm 52.26	105.53 \pm 31.02	<0.001
High density lipoprotein cholesterol (HDL-C)	41.03 \pm 3.49	43.65 \pm 11.89	0.239
Low density lipoprotein cholesterol (LDL-C)	103.62 \pm 34.18	87.28 \pm 14.09	0.016

DISCUSSION

Cholecystectomy is routinely performed surgical procedure which is usually indicated for symptomatic gallstone. The excised gallbladder is routinely evaluated by histopathological examination which establishes a tissue diagnosis. In present study gallbladder lesions were more common in females than in male with a male to female ratio of 1:3.2. This finding was similar to other studies who have reported male to female ratio of 1:2.8 and 1:2.6.^{11,12} Various factors as female sex hormones,

genetic factor and sedentary lifestyle have been suggested for female preponderance of gallbladder lesions.¹³

In the present study the most common diagnosis was chronic cholecystitis (73.17% cases). This was in concordance to the study by Sharma I et al, and Memon W et al, who have reported chronic cholecystitis in 86.2% and 64.8% cases respectively.^{14,15} Other variants of chronic cholecystitis include chronic follicular cholecystitis, chronic active cholecystitis, chronic cholecystitis with cholesterolosis and xanthogranulomatous cholecystitis. Out of these xanthogranulomatous cholecystitis is of importance as it mimic gallbladder carcinoma grossly due to increased wall thickness.^{16,17} Therefore microscopic examination is needed for confirmation of diagnosis. In present study xanthogranulomatous cholecystitis was observed in 1.39% cases which were similar to other study.¹⁴

Various studies have shown that incidental gallbladder carcinoma with no gross abnormality is found in 0.5-1.1% of cholecystectomy specimens. Hence routine histopathological examination of resected cholecystectomy specimen is recommended.¹⁸⁻²⁰ In the present study adenocarcinoma of gallbladder was diagnosed in 2(0.7%) cases. Sharma I et al, have reported 0.57% gallbladder carcinoma in their study which is similar to present study.¹⁴

Other authors have reported higher incidence of gallbladder carcinoma.^{10,21} The risk factors for gallbladder carcinoma are age more than 60 years, female sex, polyps larger than 1 cm and longstanding cholelithiasis. In present study both cases of adenocarcinoma were an incidental finding and seen in female more than 60 years. Hence cholecystectomy in elderly female patient should be evaluated carefully to rule out incidental carcinoma.

Hypertriglyceridemia, hypercholesterolemia and low level of HDL-C are common finding in patients with cholelithiasis which in turn are risk factors for coronary artery disease and stroke.²²⁻²⁴

In the present study the mean serum total cholesterol, triglyceride and LDL-C were elevated and statistically significant (p 0.024, <0.001 and 0.016) in patient with gallstone compared to control. Batajoo H et al, also observed high levels of mean serum total cholesterol, triglycerides, LDL-C and low level of serum HDL-C, however in their study only serum LDL-C level showed statistically significant difference between cases and control.²⁵

Olokoba AB et al, have reported elevated levels of serum total cholesterol and triglycerides in gallstone patients than in individuals without gallstone disease, but the difference was not statistically significant.²⁶ Other studies have reported no association between gallbladder disease and increased level of serum triglycerides.³

CONCLUSION

Routine histopathological examination of cholecystectomy specimens reveals various benign and malignant pathologies of gallbladder. There is more chance of detecting incidental carcinoma in cholecystectomy specimen of elderly patients. Hence these specimens should be examined meticulously. Increased level of serum total cholesterol, triglyceride and LDL-C along with decreased HDL-C in patients with gallstone may pose a risk to cardiovascular disease.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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