



Gallbladder Diseases in Rural India with Special Emphasis on Etiology and Risk Factors

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Introduction

As the cholesterol was considered as major etiological factor in formation of gallstones, gallbladder diseases were considered to be diseases of western world. In UK the prevalence of gallstones at the time of death is estimated to be 17% and may be increasing¹. The rate is little lower in African and Indian women which is estimated to be 3-5%. But because of westernization of life style incidence of gall stones is increasing in India not just in urban areas but also in rural areas as well. Gall stones are seven times more common in North than in South India². Gall stones are believed to be etiological factor for acute calculus cholecystitis (90% cases of acute cholecystitis) and chronic calculus cholecystitis (95% cases of chronic cholecystitis). Gall stones are also responsible for some cases of acute pancreatitis³. In fact the gall stones are frequently present (88-95%) in patients of gall bladder carcinoma.

Aim and Objectives

To study risk factors and etiology in cholecystectomy specimens.

Materials and Methods

Source of Data

The present study includes prospective cases of two years from June 2015 to May 2017 and also includes cases from retrospective archival of data of two and half years i.e. – Jan 2013 to May 2015. Thus it includes 130 cases of cholecystectomy specimens during Jan 2013 to June 2017.

Inclusion Criteria

All Cholecystectomy specimens received in the Department of Pathology in our institute during Jan 2013 to June 2017.

Exclusion Criteria

There is no exclusion criterion in this study.

Method of Data Collection

The specimens were collected in 10% formalin following scrutiny of the patient details and identity. The specimens of cholecystectomy were fixed in formalin for 12-24 hours. Gross examination of all the specimens were done. Bits from one representative full-thickness section from the fundus, one through the body, one through neck of the gallbladder, and one cross section of the cystic duct margin were taken. Additional sections were taken when focal lesions

were present. These were followed by routine paraffin processing.

Observations and Results

Out of these 130 cases, in 129 (99.23%) cases gall bladder was surgically resected as a therapeutic measure for clinically suspected cholecystitis and in remaining only 1 case (0.77%) gall bladder was removed with Pancreaticoduodenectomy.

Out of 130 cholecystectomy, 111 were laproscopic and 19 were open laprotomy cholecystectomy.

Out of 19 open laprotomy procedures, 2 procedures were initially started as laproscopic cholecystectomy and were converted into open procedures as gall bladders having necrotizing cholecystitis got ruptured during procedure.

Maximum numbers of patients were in the age group of 41-50 years (26.1%) followed by 51-60 years (20.8%) and 61-70 (18.4%) years.

Mean age of the patient was 50 years. Oldest patient was 80 years, and the youngest was 17 years of age.

Out of total 130 cases, 69 (53%) were female and 61 (47%) were male. Females were common in age group of 31 to 60 years. After 60 years male patients were more common.

Out of total 130 patients, 126 (96.92%) patient were nonvegetarian and 4 (3.08%) patients were vegetarian.

Total 51 (39%) patients used to have food for 3 or more times a day, and 79 (61%) patients used to have food for only 2 times a day.

In the present study most of the patients (95%) were adults (above 21 years), and among them, 80% patients were above 60 kg weight. Mean weight of patients was 71 kg. Minimum weight of patient was 49 kg. Maximum weight was 91 kg.

Average BMI in this study was 26.75 kg/m². Average BMI in study for gallbladder diseases patients was higher than average BMI of normal population which is statistically significant by higher odds ratio (1.21).

Out of 130 total patients 18 patients (13.84%) had diabetes, so presence of diabetes as risk factor in

gall bladder disease is statistically significant by higher odds ratio (2.66).

Out of 130 total patients 20 patients (15.3%) were having history of chronic alcohol consumption, among 20 patients having history of chronic alcohol consumption 12 had pigment stone, 6 had mix stone and in 2 patients gallbladder was acalculous.

Discussion

The findings of age and sex distribution is in concordance with studies of Daniel Mønsted Shabanzadeh et al⁴, Vikash Talreja et al⁵, Yen-Chun Chen et al⁶, and Tadashi Terada⁷.

Gall bladder diseases are common in non-vegetarian than in vegetarian patients. In present study 96.9 % patients were non-vegetarian, finding is in concordance with study of Pradhan SB et al⁸ and Mima Maychet Sangma et al⁹.

Table No.-1 Comparison of BMI with other Study

Study	Odds ratio (for BMI >25 kg/m ²)
Festi D et al. , 2008.	1.07
Muhammad Rizwan Khan et al, 2011.	1.10
Wegene Borena et al , 2014.	1.94
Yen-Chun Chen et al , 2014.	1.05
Present study , 2017	1.21

In study done by Shaffer EA and Small DM¹⁰ average weight of patients was 74.7 kg, which is in concordance with the present study.

Present study finding of high BMI in gallbladder disease patients is in concordance with study of Yen-Chun Chen et al⁶, Festi D et al¹¹, Muhammad Rizwan Khan¹² et al and Wegene Borena et al¹³.

Table No-2 Cholecystectomy Patients Having Diabetes: Comparison with other studies

Study	Percentage of diabetic patients	Odds ratio
Festi D et al. , 2008	-	2.72
Wegene Borena et al , 2014.	-	5.38
Yen-Chun Chen et al , 2014	-	1.46
Yaser Froutan, 2015	-	2.63
Sharma et al , 2017	-	1.035
Byung Hyo Cha et al, 2017	-	0.73
Present study,2017	13.84%	2.66

Present study noted increased incidence of gallbladder diseases in diabetic patients. Findings are in concordance with study of Festi D et al¹¹; Yaser froutan¹⁴, Wegene Borena et al¹³ and Yen-Chun Chen et al⁶. Thus there exists statistically significant relationship of diabetes as an etiological factor in gall bladder disease.

Diabetic patients seem to have an increased incidence of gallstones and gall bladder diseases. These are primarily related to fatty infiltration of the liver, obesity associated with type 2 diabetes and not to the diabetes itself. Obesity leads to secretion of bile by the liver that is supersaturated with cholesterol, leading to crystallization and stone formation¹⁴.

According to the study done by Mugharbel KM et al¹⁵, 76 % of type II diabetic patients are overweight and obese. Yaser froutan¹⁴ in his study observed 24(64%) out of 37 patients with gallstones were having fatty liver and 7 (19%) patients were having hyperlipidemia, and 8(22%) patients were having diabetes.

Table No- 3. Cholecystectomy Patients Having History of Chronic Alcohol Consumption: Comparison with other Studies

Study	Percentage of patients with history of chronic alcoholism	Odds ratio
Yen-Chun Chen et al, 2014	-	7.85
Byung Hyo Cha et al, 2017	-	0.24
Present study	15.3 %	4.86

Out of 130 total patients 20 patients were having history of chronic alcohol consumption. Ratio is statistically significant; proving role of alcohol as a causative factor in occurrence of gall bladder disease; and this finding is in concordance with the study of Yen-Chun Chen et al⁶. Study done by Byung Hyo Cha et al¹⁶ shows that there is decrease in incidence of gall stone formation if person consumes alcohol.

In the present study 60% patients having history of chronic alcohol consumption had pigment stones. The odds ratio was 85.71. Similar study done by Wayne H. Schwesinger¹⁷ also showed

increased percentage of pigment stones in gallbladder disease with positive alcohol history. After causing chronic liver disease, alcohol as an etiological factors is responsible for gall stone formation as it alters composition of bile¹⁸.

Studies done by Modaine P et al, and Masui H. et al observed that alcohol stimulates gall bladder emptying, while study done by Ugwu AC et al noted no significant difference in the gallbladder motility between alcohol drinkers and non-drinkers. So moderate alcohol ingestion does not stimulate gallbladder motility and therefore should not be indicated for the prevention or treatment of cholelithiasis or biliary dyskinesia¹⁸. So alcohol has controversial relationship as etiological agent in causing gallbladder disease according to different studies, but it has very strong association in causing pigment gallstones .

In 20 patients with history of chronic alcohol consumption, tests like high CRP level, ESR and elevated neutrophil count with ultrasonographic evidence of stone in gallbladder¹⁹ helped in addition to liver function tests to differentiate, whether derangement of liver function test was due to chronic alcohol consumption or due to attack of cholecystitis, as liver function test gets deranged in both the conditions²⁰.

Clinically presence of Murphy's sign can also help in diagnosis of cholecystitis in chronic alcohol consumer patients.

Summary

- The present study includes prospective cases of two years from June 2015 to May 2017 and also includes cases from retrospective period (archival of data) of two and half years i.e. – Jan 2013 to May 2015. Thus it includes 130 cases of cholecystectomy specimens during Jan 2013 to June 2017.
- Out of 130 cholecystectomies, 111 (85.3%) were laproscopic and 19 (14.7%) were open laprotomy cholecystectomies.
- Maximum number of patients were in age group of 41-50 years (26.1%).

- Mean age of patient was 50 years. Oldest patient was 80 years, and the youngest was 17 years of age.
- Out of total 130 cases, 69 (53%) were female and 61 (47%) were male.
- In the present study, 96.9% patients were non-vegetarian and 61% patients used to have food for 2 times a day only.
- Average BMI of patients in study (26.75 kg/m²) was higher, which was statistically significant by Odds Ratio (1.21).
- Diabetic patients constitute 13.84% of total cholecystectomy patients, so diabetes proved to be a risk factor for development of gallbladder diseases with statistically significant Odds Ratio (2.66).
- Out of 20 (15.38%) patients with history of chronic alcohol consumption, pigment stones were present in 12 patients. Positive association of pigment gallstones with history of chronic alcohol consumption was noted in cholecystectomy patients with Odds Ratio of 85.71.

Conclusions

Study showed predominance of female patients between age group 41-50 years. Patients with history of diabetes, alcohol consumption, non vegetarian diet pattern and high BMI were found to be affected by gallbladder diseases.

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