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A CLINICOPATHOLOGICAL STUDY OF CHOLELITHIASIS IN AN EASTERN INDIAN POPULATION

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ABSTRACT

Cholelilithiasis or gallstone disease is a common world wide ailment mostly affecting middle aged females. Gallbladder harbouring gallstones present many histopathological findings. Gallstones are also one of the predisposing factors for adenocarcinoma of gallbladder. Seventy gallbladder specimens were obtained from patients of cholelithiasis undergoing elective cholecystectomy in a tertiary care hospital in Odisha. A prospective study was carried out to study the clinicopathological aspects of cholelithiasis, find out its risk factors and the prevalence of different type of gallstones. The resected specimens were also subjected to histopathological examination. Age, female sex, non vegetarian diet, sedentary lifestyle were identified as the main risk factors for cholelithiasis. Mixed stones were the most common variety of gallstones in our study and chronic cholecystitis was the most common associated histopathological finding.

KEY WORDS: Cholelithiasis, Gallbladder, Risk factors, Histopathology

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INTRODUCTION

Incidence of cholelithiasis or gallstone disease is known since the dawn of the civilisation. The gallstones have been discovered in Egyptian mummies preserved since early Egyptian civilisation. Description of gallstones is also found in ancient Indian literature. Stones are formed in various parts of the body like urinary system, biliary system, pancreas, prostate and salivary glands. Among them gallstones are the most most important ailment because of its diverse presenting symptoms, serious complications it carries and its association with the dreaded carcinoma of gallbladder. Prevalence of gallstones varies widely in different parts of the world. In India it is estimated to be around 4%. An epidemiological study restricted to rail road workers showed that North Indians have seven times higher occurrence of gallstones as compared to South Indians. There has been a surge of in the incidence of cholelithiasis in the west during the past century.2 At least twenty million persons in the United States have cholelithiasis and approximately one million new cases develop every year. In Europe, the prevalence is 18.5% with the lowest prevalence from Ireland (5%) and highest prevalence from Sweden (38%). Prevalence rate is between 15% and 25% in Australia. Highest prevalence is observed in Pima Indian tribe of Arizona. Gallstones are rare in Africa with prevalence of less than 1% and in Japan it varies between 2% and 7%.2 In medical practice. gallstones may present as an emergency in a patient suddenly developing pain in right hypochondrium, fever and chills with jaundice whereas it may present as an incidental finding in radiological examination. Patients who are asymptomatic gallstone carriers pose a special problem for diagnosis as also its association with heart disease from time to time. Therefore correct diagnosis is of utmost importance as well as knowledge of incidence and risk factors without which a timely and correct treatment can not be instituted. Along with the varied

clinical presentation of cholelithiasis it is important to recognize the various complications of the disease, as those are directly related to the morbidity and mortality of gallstone patients. It's also valuable to recognize the risk of carcinoma developing in cases of cholelithiasis of long duration. Histopathological study of surgically removed gallbladder helps in evaluation of different pathological changes occurring in cholelithiasis and also in detection of the occult malignant change in the organ. As there is increased incidence of gallstones in India as well as in the West, there is a great need for studies which can provide information regarding the prevalence of the disease, various risk factors, signs and symptoms of the disease, diagnostic modalities and treatment. Therefore the current study was carried out to find the gross and histological changes in gallbladder affected by cholelithiasis, risk factors of the disease and prevalence of different types of gallstones.

MATERIALS AND METHODS

The current study was a prospective study conducted in a tertiary care hospital in Odisha. The gallbladder specimens were obtained from surgery indoor admitted of cholelithiasis undergoing elective cholecystectomy. The requisite permission was obtained the Institutional Ethics Committee. Ethical registration No is 185\31-08-2012. Very old, debilitated patients with comorbidities like severe hypertension and Diabetes mellitus as well as patients with poor cardiovascular status were excluded from our study. We included symptomatic cases only. Asymptomatic cases and patients incidentally detected with gallstones were excluded from our study. The case history, clinical findings, radiological investigations, laparotomy findings and histopathological investigations were recorded as per the following proforma.

PROFORMA

- 1. Name
- 2. Age
- 3. Sex
- 4. Religion
- 5. Occupation
- 6. Weight
- 7. Date of Admission
- 8. Registration number
- 9. Date of Operation
- 10. Date of discharge
- 11. Marital status and fetility in case of females
- 12.Ultrasonography report of abdomen and pelvis to obtain the thickness of the gallbladder wall (These days ultrasonography of abdomen, pelvis is mandatrory before planning any surgery for cholelithiasis.)
- 13. Chief Complaints: Symptoms recorded with duration in chronological order.
- 14. History of present illness.
- 15. Past history
- 16. Family history
- 17. Personal history- with special reference to the type of diet (vegetarian or nonvegeterian)
- 18. General examination
- 19.Local examination- Inspection, Palpation. Percussion, Auscultation.
- 20. Systemic examination
- 21. Operative findings
- (a) Pathological changes in gallbladder
- (b) Number, site and type of stones recovered

22. Histological studies of gallbladder

The resected specimens of gallbladder were fixed in formol saline. Detailed gross examination was done after dissecting it. The gallbladders were also subjected to

histological examination using hematoxylin and eosin stain. The histopathological inference was drawn after consulting a pathologist.

RESULTS

AGE AND SEX

TABLE I SEX DISTRIBUTION

Sex	No of cases	%
Male	21	30
Female	49	70

TABLE II

MALE : FEMALE RATIO IN DIFFERENT AGE GROUPS

SI. No.	DIFFERENT AGE GROUPS	MALE	FEMALE	MALE : FEMALE RATIO
1	31-40 Years	4	11	1: 2.7
2	41-50 Years	8	19	1: 2.4
3	51-60 Years	6	15	1: 2.5
4	61-70 Years	3	4	1: 1.3
5	All ages included	21	49	1: 2.3

Middle aged females were mostly affected by cholelithiasis.

DIETARY HABITS

TABLE III DIETARY HABITS

SI. No.	Dietary habit	No of cases	%
1	Nonvegetarians	58	82.8
2	Vegetarians	12	17.1

Taking nonvegeterian diet was clearly observed in most of the sufferes.

PARITY

Out of 49 females 27 were having 3 or more children. So the percentage of females with 3 or more children was 55.1%.

INCIDENCE OF SYMPTOMS

TABLE IV PRESENTING SYMPTOMS

SI. No.	SYMPTOM	No of cases	%
1	Pain	58	82.8
2	Flatulent dyspepsia	54	77.1
3	Belching	50	71.4
4	Heartburn	20	28.5
5	Nausea	54	77.1
6	Vomiting	35	50.0
7	Chill and fever	12	17 1

The most common symptom was pain which could be due to the associated inflammation or mass effect of stones.

OBESITY

TABLE V INCIDENCE OF OVER WEIGHT, AVERAGE –WEIGHT AND UNDERWEIGHT PATIENTS IN RELATION TO CHOLELITHIASIS

SI No	SI, No. Description Male Female				Total		
31. NO.	Description	No of cases	%	No of cases	%	No of cases	%
1	Average weight (55±10Kg)	17	24.3	9	12.8	26	37.1
2	Overweight (>65Kg)	4	5.7	38	54.2	42	60
3	Underweight (<45Kg)			2	2.8	2	2.8

Most of the cases were found to be obese.

INCIDENCE OF SIGNS

TABLE VI INCIDENCE OF DIFFERENT SIGNS IN CHOLELITHIASIS

SI. No.	Sign	No of cases	%
1	Temperature elevation	20	28.5
2	Jaundice	16	22.8
3	Abdominal tenderness	48	68.5
4	Abdominal rigidity	3	4.2
5	Mass in right hypochondrium	8	11.4
6	Murphy's sign	42	60

Temperature elevation clearly indicates systemic inflammation whereas abdominal tenderness, abdominal rigidity and mass in right hypochondrium point towards local inflammation.

STONES

All the stones from seventy cholelithiasis cases were collected.

TABLE VII NUMBER OF GALLSTONES

SI. No.	Number of gallstones	No of cases	%
1	Solitary	11	15.7
2	Multiple	59	84.3

TABLE VIII DIFFERENT SITE OF STONE LODGEMENT AS SEEN IN LAPAROTOMY

SI. No.	Sites	No of cases	%
1	Lumen of the gallbladder	59	84.2
2	Hartman's pouch	4	5.7
3	Gallbladder and Hartman's pouch	2	2.8
4	Cystic duct	3	4.2
5	Gallbladder and common bile duct	2	2.8

TABLE IX INCIDENCE OF DIFFERENT TYPE OF STONES

SI. No.	Type of stones	No of cases	%
1	Cholesterol stones	7	10
2	Pigment stones	13	18.6
3	Mixed stones	50	71.4

Most of the stones were confined to the gallbladder indicating that most of the gallstones mostly originated in the gallbladder.

GROSS CHANGES IN GALLBLADDER IN CASES OF CHOLELITHIASIS CHANGES IN SEROSAL SURFACE

TABLE X Character of Serosal surface

SI. No.	Character of Serosal surface	No of cases	%
1	Congested	21	30
2	Not congested	49	70

TABLE XI THICKNESS OF THE GALLBLADDER WALL

SI. No.	Thickness of the gallbladder wall	No of cases	%
1	<3mm	42	60
2	≥3mm	28	40

TABLE XII CHANGES IN MUCOSA OF GALLBLADDER

SI. No.	Character of mucosa	No of cases	%
1	Normal	26	37.1
2	Hemorrhagic	6	8.5
3	Strawberry like	5	7.1
4	Atrophic	24	34.2
5	Slightly nodular	9	12.8

The gallbladder was thickened and showed haemorrhage, atrophy, nodularity which clearly point towards longstanding inflammation.

TABLE XIII HISTOPATHOLOGICAL CHANGES

Serial No	Histopathological findings	Number of cases	%
1	Chronic cholecystitis and its variants	59	84.28
2	Acute cholecystitis	10	14.28
3	Adenocarcinoma	1	0.01

The resected specimens on being subjected to histopathological examination mostly revealed chronic or acute inflammation.

DISCUSSION

Most of the subjects of our study were females, the male to female ratio being 1:2.3. Maximum incidence of cholelithiasis was observed in the 5th decade, both in males and females. The mean age was 47.4 years for both sexes. 82.8% subjects were non vegeterians. The ratio of non vegeterians to vegeterians was 4.8:1. Out of the females 55.1% had 3 or more children. The symptoms of cholelithiasis were mostly abdominal pain followed by flatulent dyspepsia. Most of the cases (60%) were obese. Abdominal tenderness and Murphy's sign were the most frequent features elicited on clinical examination. On laparotomy, most of the stones were multiple and confined to the gallbladder. Further most of the stones were mixed stones followed by pigment stones and cholesterol stones were the least common. On ultrasonography, the gallbladder wall was found to be ≥3 mm thick in 40% cases. On gross examination of the resected gallbladder specimens, the serosal surface showed congestion in 30% cases. Gross changes in the mucosa of the resected specimens mostly appeared normal. However, the mucosa also showed haemorrhage, strawberry like appearance, atrophy and nodularity..Histopathologic study of the resected specimens mostly presented with chronic cholecystitis followed by acute cholecystitis. Malignant and premalignant changes were also observed. The male to female ratio was found to be comparable to that of ThamilSelvi et al³ and Almuslamani et al⁴ as they found the male to female ratio to be 1:1.6 and 1:2.75 respectively. Baidya et al⁵ also found the male to female ratio to be 1:1.8 in their study. Vahini et al⁶ found the maximum incidence of cholelithiasis in the 5th decade, similar to our study. However, ThamilSelvi et al³ found maximum incidence of gallstones in the 6th decade. The mean age was found to be 45.9 years by ThamilSelvi et al³, 42.5 years by Khanna et al⁷ and 52 years by Baidya et al⁵. Their findings were clearly comparable to the mean age of presentation in our study. ThamilSelvi et al³ reported that cholelithiasis was 4 times more common in non vegeterians, similar to our study. Most of the current surgery texts agree with us that abdominal pain followed by flatulent dyspepsia were the most frequent symptoms in gallstone disease. Most of the surgery texts also highlight the association of obesity with cholelithiasis. Coming to the laparotomy features, Thamil-Selvi et al³ and Khanna et al⁷ mostly found multiple stones in their studies. And according to Schwartz⁸ most of the cases of cholelithiasis present stones confined to the lumen of the gallbladder. Sternberg⁹ and ThamilSelvi et al⁹ reported mixed stones

as the most prevalent type of gallstones followed by pure variety of stones. On ultrasonography, the gallbladder wall was found to be ≥3 mm thick in 40% cases by Khanna et al⁷ and in 45.7% cases by Baidya et al⁵ similar to our study. Serosal surfaces of the resected gallbladder specimens were found to be congested in 28.5% cases by Khanna et al⁷, which is close to our findings. Baidya et al⁵ reported comparable percentage of congested serosa in their study (28%). The findings of mucosal alteration (haemorrhage, nodularty, atrophy) in our study were similar to that of Khanna et al.7. ThamilSelvi et al3, Almuslamani et al4, Baidya et al5, Costa et al 10 are all of the opinion that chronic cholecystitis is the most frequent histopathological condition associated with gallstones followed by acute cholecystitis as highlighted by our study. All the above mentioned authors have also reported malignant and premalignant changes in gallbladders harbouring gallstones. The prevalence of gallstones in middle aged multiparous females indicate a possible hormonal cause behind the causation of cholelithiasis. Obesity and non vegetarian dietary habit found in majority of the sufferers point towards unhealthy and sedentary lifestyle as one of the probable reasons behind formation of gallstones. Clinical features of cholelithiasis can be explained as local or systemic manifestations of associated inflammation of shorter or longer duration. Gross and histopathological changes of gallbladder associated with gallstones mostly indicate chronic inflammatory process in the gallbladder. Cancerous and precancerous changes in the vicinity of carcinoma detected in the resected gallbladder specimens in our study supports the metaplasia- dysplasia- carcinoma sequence as the probable mechanism of the pathogenesis of the carcinoma of gallbladder¹⁰

CONCLUSION

Our study established the dictum that fatty, fertile, females of fifty are the classical sufferers from cholelithiasis and most of the gallstones were of mixed variety. We found chronic cholecystitis to be the most common histopathological condition associated with gallstone disease and a definite association between cholelithiasis and malignant and premalignant changes of gallbladder was also observed in our study.

CONFLICT OF INTEREST

Conflict of interest declared none.

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