



A STUDY TO ANALYZE THE INCIDENCE, PATTERN, AND CHEMICAL COMPOSITION OF GALL STONES

Dr.M.Praveen*

M.S.(Generalsurgery), Consultant Surgeon, Holistic Medical Center, Gummidipoondi, Chennai. *Corresponding Author

Dr.S.Ashok

M.S,Dnb(Uro),assistant professor,Department of urology,srilakshmi narayana institute of medical sciences,osudu agaram village, puducherry.

ABSTRACT

Background: Gallstones are a major cause of morbidity throughout the world, with at least 10 % of the adults having gallstones with a recent rise in the incidence due to change in the dietary factors. This study intends to know its various modes of presentation and treatment.

Methods: 51cases were admitted, examined, investigated and operated during the period of Apr 2011 to Sep 2013. An unrestricted materials and methods were gathered. Detailed history of all the 51 cases were taken according to the proforma , relevant investigations were performed .Cholecystectomy was done. The gallbladder was sent for histopathological examination, gallstones sent for qualitative, quantitative analysis, bile was sent for analysis .

Results: The study consists of 51 cases of cholelithiasis. The highest number of patients with cholelithiasis was in the age group between 50-60 years with maximum number of patients in the 5th decade. There were an increased number of female patients. Pain was the most common symptom(present in 98% of the patients), nausea and vomiting were the second most common symptom presenting in 55% of patients, dyspepsia was present in 24% of patients, 4% of patients had fever. Tenderness in the right hypochondrium was the most common sign present in 98% of patients. Ultrasonography showed all patients had gallstones, of which 15% of patients had solitary stone. 85% of patients had multiple stone,31% of patients had thickening of gallbladder. 98% of patients undergone laparoscopy cholecystectomy, 2% of patients undergone open cholecystectomy. Histopathology revealed chronic cholecystitis in the majority of cases in the study. Gallstones analysis showed mixed stone in 92% of the cases and cholesterol stones in 8% of the cases, Mixed stones as the most common variety. Pearson correlation was significant in our study of 51 patients for blood triglyceride level and stone cholesterol was significant.Pearson correlation was significant in our study of 51 patients for blood cholesterol, biliary cholesterol and stone cholesterol. The laboratory analysis of the patients revealed 100% lithogenicity in their bile.

CONCLUSION: In our study of 51 cases, it can be concluded that elevated blood triglyceride caused elevated gall stone cholesterol levels.Elevated blood cholesterol levels caused Lithogenic bile in all our patients, predisposing to stone formation.

KEYWORDS :

INTRODUCTION

Among the many distinguished names in Hindu medicine that of Susruta, the "father of Indian surgery" stands out in prominence, he compiled the surgical knowledge of his time in his classic "susruta samhitha". It is believed that, this classic was compiled between 800B.C. and 400A.D., he described a jaundice called pitta-ashmarijanya meaning a jaundice caused by stone in bile duct. ^[1] It was also known that such jaundice could be caused by wrong diet.

The prevalence of gallbladder stone varies widely in different parts of the world. In India, it is estimated to be around 4%. There has been a marked increase in the incidence of the gall stone in the west during the past century. ^[2] In the united states the autopsy series have shown gall stones in at least 20% of women and 8% of men over the age of 40 years. ^[3] The prevalence of gallstone disease has increased in recent years. This is connected with a change in lifestyle: reduction of motor activity, reduction of the physical load and changes to diets. One of the important benefits of early screening for gallstone disease is that ultrasonography can detect asymptomatic cases, which results in early treatment and the prevention of serious outcomes.

It is estimated that at least 20 million people in the United States have gall stones and that approximately 1 million new cases of cholelithiasis develop each year. Prevalence of gallstones in Europe is 18.5% from autopsy studies with the highest prevalence from Sweden [38%] as compared to Ireland which has the lowest prevalence [5%]. In Australia the prevalence rate varies from 15% to 25%. Highest prevalence of gallstones is in Pima Indian tribe of Arizona with total prevalence of 49% and on the gender distribution females of about 73% were found to be having gallstone. Gall stones are rare in Africa with prevalence of less than 1% and in Japan it has increased from 2% to 7%. ^[2]

Diagnosis of gall stone is by proper history and physical examination and combining it with appropriate investigation which varies from surgeon to surgeon and hospital to hospital and country to country. The prevalence of gallbladder disease at any point in time (i.e., prevalence) has advanced with the use of ultrasonography surveys as opposed to previous studies based on clinical or necropsy evidence. Changing incidence in India is also mainly attributed to westernization and availability of investigation such as ultrasound, to urban as well as rural area and also because of increase affordability due to change in the socio-economic structure and the cost of investigations.

Because of increase incidence of gall stones and its variable presentations in India as well as in the west, there is a great need for a study, which can provide information regarding the prevalence of the disease, various clinical presentation and management of cholelithiasis.

AIM OF STUDY

To analyze the incidence, pattern, and chemical composition of gall stones at a Tertiary care teaching hospital.

BACKGROUND AND OBJECTIVES:

Gallstones are a major cause of morbidity throughout the world, with at least 10 % of the adults having gallstones with a recent rise in the incidence due to change in the dietary factors. This study intends to know its various modes of presentation and treatment.

MATERIALS AND METHODS

This dissertation titled as "CHOLELITHIASIS INCIDENCE AND PATTERN" was done a Tertiary care teaching hospital for a period of Apr 2011 to Sep 2013.

About 51cases were admitted, examined, investigated and

operated during the period of Apr 2011 to Sep 2013. An unrestricted materials and methods were gathered. Detailed history of all the 51 cases were taken according to the proforma approved by the guide. Information regarding the age, nature of the symptoms, duration of the symptoms, past history of similar complaints, diet history, history of OCP, alcohol ingestion, diabetes was obtained. All patients underwent detailed examination, all patients had haemogram, ECG, LFT, blood sugar, fasting lipid profile, fasting blood bile salt analysis, blood urea, serum creatinine, urine analysis, blood group, chest x-ray, ultrasound scan of the abdomen. Relevant investigations and specialty consultations were taken for patients with associated medical illness and their control was achieved. Risk and complications of the condition as well as surgery was explained to the patients, consent taken. Preoperative antibiotics were given. Intraoperatively pathological features and anatomical variations were noted. Cholecystectomy was done. The gallbladder was sent for histopathological examination, gallstones sent for qualitative, quantitative analysis, bile was sent for analysis. All patients received antibiotics and routine post operative care. Patients were examined in the post operative period for any complication. Patients were discharged and reviewed on 7th day. Patients were advised regarding diet, and to visit the surgical OPD for regular follow up.

RESULTS AND DATA ANALYSIS

This study includes a total of 51 cases that were studied prospectively over a period of two and half years, that were treated on inpatients basis at a Tertiary care teaching hospital, during Apr 2011 to Sep 2013.

Age wise distribution:

There is an increased number of cholelithiasis patients in the 5th and 6th decade with the peak in the 5th decade. In this study the youngest patient was 19 years old and the oldest patient is 76 years.

Gender wise distribution :

In the present study 32 patients were female and 19 patients were male. The present study shows gallstones diseases is a common problem in female population. The female to male ratio is 3:2.

Presenting Symptoms :

In our study pain was the commonest symptom presenting in 50 patients, 28 patients had nausea and vomiting, dyspepsia was present in 12 patients and fever was present in 2 patients.

General physical examination wise :

In our study 15 patients were obese, 20 patients were overweight, 14 patients normal built, and 2 patients thin built. 4 patients had pallor.

Presenting signs

In present study 50 patients had tenderness in the right hypochondrium as the predominate sign, 2 patients had murphy's sign positive.

Investigations:

In present study 9 patients had normal fasting lipid profile, 8 patients had elevated cholesterol alone, 34 patients had both elevated cholesterol and elevated triglycerides. Mean of triglycerides is 228.8 ± 96.9 Range 321(92-413) .

Ultrasound:

Ultrasound scanning of the abdomen was done in all patients. All patients had stones in the gall bladder, solitary stones were present in 8 patients and 43 had multiple stones . Thickening of gall bladder was found in 16 patients.

Histopathology report:

In the present study 48 patients were reported as having chronic Cholecystitis, 2 patients were reported as having acute Cholecystitis, 1 patient had no Cholecystitis.

Qualitative analysis of Gall stones:

In the present study gallstones qualitative analysis was done in all patients. 47 patients had mixed type of stone, 4 patients had pure cholesterol stone and no patient had pigment stone.

Quantitative analysis of Gall stones:

Quantitative analysis of Bilirubin in Gall stones.

Table 1: Quantitative analysis of bilirubin in Gall stones wise distribution of patients with cholelithiasis

Bilirubin in gall stones	No of stones	%
10-20mg/g	7	13.7
20-30mg/g	15	29.4
30-40mg/g	10	19.6
40-50mg/g	6	11.8
>50mg/g	9	17.6
0mg/g	4	7.8
Total	51	100.0

Quantitative analysis of cholesterol in gall stones

Table 2: Quantitative analysis of Cholesterol in Gall stones wise distribution of patients with cholelithiasis

Cholesterol in gall stones	No of stones	%
0-100mg/g	14	27.5
100-400mg/g	6	11.8
>400mg/g	31	60.8
Total	51	100.0

Bile analysis

In the present study bile analysis was done for all patients, Bile biliary salts mean is 4.8382 ± 1.776 Range 7.68 (9.64-1.96).

Bile cholesterol mean is 3.1325 ± 1.722 Range 6.91(7.21-0.30).

DISCUSSION

In this study 51 cases of Cholelithiasis were admitted in a Tertiary care teaching hospital for a period of Apr 2011 to Sep 2013 were studied. After a detailed history, examination, clinical investigations & treatment observations were noted.

AGE WISE DISTRIBUTION OF PATIENTS WITH CHOLELITHIASIS

In this study cases fall between 19 – 76 Yrs. There is a increased number of cases in the 4th & 6th decade with the maximum number in the 5th decade. Similar findings are noted in the studies of Bhattacharya et al^[3], Goswitz et al^[4] .

GENDER DISTRIBUTION

In our study 32(63%) out of 51 cases were female while the rest 19(37%) were male. Battacharya series showed 71% were female, 29% were male.. Similar sex preponderance in the favour of females were noted by A.P.Tamhankar^[5], Ganey et al^[6] .

PRESENTING SYMPTOMS

Pain was the predominant symptoms in the present study with 98%. The commonest site of pain was in the Rt. Hypochondrium. 48 patients had chronic Recurring pain, 2 patients had acute onset of pain. Similar presentations were noted in the series of Alok Sharma^[7], Ganey series, Goswitz et al series.

55%(28 patients) of cases in the present series had nausea/ vomiting. Similar presentations were noted in the series of Goswitz et al. Vomiting was spontaneous, occurred mostly during the attack of pain. The Endoscopic examination in these patients did not reveal any pathology. On ultrasound examination, these patients had Gall stones. The dyspepsia

was relieved after these patients undergone Cholecystectomy. Fever was present in 2 cases in the present study. Fever was of moderate degree. Past history did not show anything significant in the cases taken for study.

GENERAL PHYSICAL EXAMINATION

In our study 15 patients obese, 20 patients were overweight, 14 patients normal built, and 2 patients thin built. Risk for gallstones increased 7% for every 1kg/m² increase in measured BMI according to Stefan Stender et al.^[8]

SIGNS

Tenderness in the Rt. Hypochondrium was present in 50 patients, guarding was present in 2 patients. A positive Murphy's sign present in 2 patients.

INVESTIGATIONS

All the patients underwent routine hematological & biochemical investigations.

Elevated cholesterol was present in 8 patients, elevated cholesterol and elevated triglyceride was present in 34 patients, normal lipid profile was present in 9 patients.

RADIOLOGY

Ultrasound scanning was done in all patients, all the cases revealed stone in the gall bladder. 15 %(8 patients) had solitary stones in gall bladder, 85%(43 patients) had multiple stones in gall bladder. Gall bladder thickening was present in 31%(16patients). Similar findings were present in the study of major Alok Sharma et al.

HISTOPATHOLOGY EXAMINATION

In our study 48 patients were reported as having chronic Cholecystitis , 2 patients were reported as having acute cholecystitis, 1 patient had no cholecystitis. Which is similar to the series by Battacharya et al, Raza et al^[9].

GALL STONE ANALYSIS

The means of stone cholesterol and blood triglycerides was significant (independent t test p value<0.001significant,t-4.1999,degree of freedom 49 t is significant).

Stone cholesterol level has a positive correlation with blood triglyceride level. Pearson correlation=0.613(correlation is significant at 0.01,p value<0.001 significant)

Table 3: Pearson Correlation between biliary cholesterol, stone cholesterol and blood cholesterol

		Biliary cholesterol	Stone cholesterol	Blood cholesterol
Biliary cholesterol	Pearson Correlation	1	.727**	.419**
	N	51	51	51
Stone cholesterol	Pearson Correlation	.727**	1	.434**
	N	51	51	51
Blood cholesterol	Pearson Correlation	.419**	.434**	1
	N	51	51	51

** . Correlation is significant at the 0.01 level .

Biliary cholesterol, stone cholesterol and blood cholesterol have a positive correlation. Pearson Correlation between biliary cholesterol, stone cholesterol and blood cholesterol is significant (0.727 and 0.419 correlation is significant at the 0.01 level ,p value<0.001 significant).

SUMMARY

The study consists of 51 cases of cholelithiasis.

1. The highest number of patients with cholelithiasis was in the age group between 50-60 years with maximum

number of patients in the 5th decade. There were an increased number of female patients.

2. Pain was the most common symptom(present in 98% of the patients), nausea and vomiting were the second most common symptom presenting in 55% of patients, dyspepsia was present in 24% of patients, 4% of patients had fever.
3. Tenderness in the right hypochondrium was the most common sign present in 98% of patients.
4. Ultrasonography showed all patients had gallstones, of which 15% of patients had solitary stone. 85% of patients had multiple stone,31% of patients had thickening of gallbladder.
5. 98% of patients undergone laparoscopy cholecystectomy, 2% of patients undergone open cholecystectomy.
6. Histopathology revealed chronic cholecystitis in the majority of cases in the study.
7. Gallstones analysis showed mixed stone in 92% of the cases and cholesterol stones in 8% of the cases, Mixed stones as the most common variety.
8. Pearson correlation was significant in our study of 51 patients for blood triglyceride level and stone cholesterol was significant.
9. Pearson correlation was significant in our study of 51 patients for blood cholesterol, biliary cholesterol and stone cholesterol. The laboratory analysis of the patients revealed 100% lithogenicity in their bile.

CONCLUSION

1. In our study of 51 cases, it can be concluded that elevated blood triglyceride caused elevated gall stone cholesterol levels.
2. Elevated blood cholesterol levels caused Lithogenic bile in all our patients, predisposing to stone formation.

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