

Epidemiology of Gall Stone Disease

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ABSTRACT

Objective: The aim of this study was to study the epidemiology of Gall stone disease in patients who were offered surgery in patients with symptomatic gall stone disease.

Materials and methods: 231 patients were included in the study who presented with symptomatic gall stone disease to the department of Surgery at a peripheral hospital in Himachal Pradesh, India. All patients underwent Ultrasound of Abdomen to confirm gall stones sonologically.

Conclusion: Gall stone disease is more common in females (70.12%) as compared to males (29.87%). It is most common in the age group between 51-60 years (23.80%) and affects patients who have weight of more than 60 kg (88.74%). Gallstone disease was more common in patients who consumed a non-vegetarian diet (64.93%) and showed a predilection towards diabetics (20.77%). Inclusion and exclusion criteria were defined and 89 patients (38.52%) could be offered Laparoscopic surgery as against 142 patients (61%) who were offered Open Cholecystectomy at a peripheral hospital with an incidence of biliary injury of 4 patients (1.73%). The incidence of biliary injury was 3 patients in patients who underwent open Cholecystectomy and 1 patient in cases of Laparoscopic Cholecystectomy.

KEYWORDS: Epidemiology, Gall stone disease, Laparoscopic Cholecystectomy, Open Cholecystectomy

INTRODUCTION

Diseases of the gallbladder are common and costly and manifest as gallstones and gallbladder cancer. The epidemiological methods to determine the prevalence of gallstone disease is ultrasonography and the number of cholecystectomies performed in a given population. Many risk factors for gallstone formation are not modifiable such as ethnic background, increasing age, female gender and family history or genetics. Modifiable risk factors for gallstones are obesity, rapid weight loss and a sedentary lifestyle. The rising epidemic of obesity and the metabolic syndrome predicts an escalation of gallstone frequency. Literature mentions that a classic patient of gall stone disease is a fat, fertile, female in her forties.

AIM

The aim of this study was to study the epidemiology of Gall stone disease in patients who were offered surgery in the form of Laparoscopic and Open Cholecystectomy in patients with symptomatic gall stone disease.

MATERIALS AND METHODS

This is a retrospective study wherein 231 patients were included who presented with symptomatic gall stone disease to the department of Surgery at a peripheral hospital in Himachal Pradesh, India from Jan 2012 to Dec 2015. Only

one surgeon attended to the patients. All patients underwent Ultrasound of Abdomen to confirm gall stones sonologically. Haematological and biochemistry tests were performed for all the patients who were offered surgery. Patients who had Ultrasound studies showing dilated common bile duct more than 7mm associated with altered liver function tests in the form of raised bilirubin levels, SGOT and SGPT values were referred to Gastro Intestinal Surgeon at a tertiary care centre. Inclusion and exclusion criteria for Laparoscopic and Open surgery:

Thin patients with no history of jaundice, Acute cholecystitis, Acute gall stone pancreatitis, previous upper abdominal surgery were offered Laparoscopic surgery. Obese patients, patients with multiple episodes of Acute Cholecystitis and history of choledocholithiasis and ERCP clearance were planned for Open Cholecystectomy. The threshold for conversion from Laparoscopic to Open Cholecystectomy was kept low and conversion to Open Cholecystectomy on facing the slightest difficulty in clearing the Calot's triangle or whenever unsure about the anatomical variations in the Calot's triangle was followed.

Ethical Approval: Approval for the study was granted by MH Yol Ethics Committee and permission to analyse data of the patients was taken from Officer-Incharge of the Operation Theatre.

Statistical analysis: Statistical significant increases in changes occur thus $P \leq 0.05$.

RESULTS

A total of 231 patients with symptomatic gall stone disease were included in the study. All the patients were offered surgery in the form of Cholecystectomy over a period of 3 years extending from 2012 to 2015. 142 patients (61.47%) were offered Open Cholecystectomy, 75 patients (32.46%) underwent Laparoscopic Cholecystectomy and in 14 patients (15.73%), Laparoscopic surgery was converted into an open surgery due to dense adhesions (Fig 1).

4 patients (1.73%) suffered biliary injury revealed by leakage of bile in the intra-peritoneal drain out of which 3 patients (2.11%) underwent open Cholecystectomy and 1 patient (1.33%) had undergone Laparoscopic Cholecystectomy.

Out of the 231 patients who were offered surgery, 69 patients (29.87%) were males and 162 patients (70.12%) were females (Fig 2).

The most common age group which reported for surgery for symptomatic gall stone disease was between 51-60 years which included 55 patients (23.80%) closely followed by the age bracket of 31-40 years which included 50 patients (21.64%). 42 patients (18.18%) were between the age group between 41-50 years and 39 patients (16.88%) were between the age bracket of 61-70 years. 34 patients (14.71%) were between the age group of 21-30 years and 11 patients (4.76%) were between the age group of 71-80 years (Fig 3)

48 patients (20.77%) were known diabetics out of which 39 patients (81.25%) were on oral hypoglycemic agents and 9 patients (18.75%) were on Insulin.

81 patients (35.06%) were vegetarians and 150 patients (64.93%) were non vegetarians.

Weight of the patients was recorded pre-operatively and the findings revealed that 26 patients (11.25%) had weight between 51-60 kg, 51 patients (22.07%) had weight in the range of 61-70 kg, 90 patients (38.96%) had their weight between 71-80 kg and 64 patients (27.70%) had weight in the range of 81-90 kg (Fig 4). 154 patients (66.66%) who were operated for symptomatic gall stone disease had their weight in the range between 71-90 kg (Fig 4).

DISCUSSION

Prevalence of the disease: Gallstones form a huge health problem in developed societies, affecting 10% to 15% of the adult population bringing about a yearly wellbeing spend of around 6.2 billion USD in the United States. These numbers are likely underestimated due to the fact that laparoscopic cholecystectomy is frequently executed as a day care procedure and in this manner not caught by hospital statistics that require overnight hospitalisation. As the frequency of gallstone disease heightens, there is an associative increment in complications like gallstone-related pancreatitis.¹ The introduction of laparoscopic cholecystectomy which

represents a not so invasive and more cosmetically worthy surgery has expanded the cholecystectomy rate.²

Presentation: Gall stone disease may either be asymptomatic with coincidental discovery of stones on Ultrasonography accomplished for some other reason or it might present as biliary colic, acute cholecystitis, cholangitis, or pancreatitis.

Asymptomatic gall stones: 70-80% of patients having gallstones are clinically silent and do not need to be offered surgical treatment.³

Prophylactic Cholecystectomy in asymptomatic gall stone disease: Large gallstones >3 cm or gallbladders packed with stones that convey a higher danger of creating gallbladder malignant growth might be a sign for prophylactic cholecystectomy.⁴ Sickle cell disease is associated with the development of pigment gallstones, frequently necessitating cholecystectomy. Prophylactic cholecystectomy should be considered because stone complications is frequently difficult to distinguish from the clinical features of a sickle cell crisis or its complications such as infarction of the liver or abdominal viscera.⁵ Prophylactic cholecystectomy therefore should be considered in morbidly obese patients undergoing bariatric surgery.⁶

Symptomatic gall stones: The pain due to gall stones is episodic, steady, severe located in the upper abdomen and lasts for more than 30 minutes and it has a nocturnal onset and is associated with nausea and vomiting and may radiate through to the back.⁷

Age and gender: Increasing age and female gender are risk factors for having gall stone disease.⁸ Gallstones are rare in children under the age of 10 years.⁹ The risk in females is two times higher than in males.¹⁰ Females had a greater risk of gallstone disease, especially if they had used oral contraception and/or had three or more children.¹¹ The higher prevalence of gallstone disease in females could be due to estrogen which increases the cholesterol saturation in bile and probably lead to cholesterol gallstone formation.¹²

Diet: Low fiber diet and high refined sugars were related with expanded rate of gallstones.¹³ Diet rich in fruits, vegetables, whole grain, and vegetable oil was associated with decreased risk of gall stones as fruits and vegetables to have a protective role against gallstone disease through their high antioxidant content.¹⁴ Few studies done on the role of vegetarian diet on gallstone disease suggest a protective role for vegetarian dietary pattern.¹⁵ A protective effect has also been shown with fish oil and n-3 fatty acid consumption, which are suggested to lower the rate of cholelithiasis.¹⁶ There is an increased risk of gall stone disease with high intake of solid fat, red and processed meat, and egg because these increase the biliary cholesterol saturation and induce cholesterol gallstones.¹⁷

Laparoscopic versus Open Cholecystectomy: A planned open cholecystectomy may be performed in cases of cirrhosis, gallbladder cancer, extensive upper abdominal surgeries with adhesions. Critically ill patients also may necessitate the need for a planned open cholecystectomy. An open procedure is less distressing in critically ill patients

because the physiological changes associated with a surgical pneumoperitoneum may add further risk to the health of already critical patient. 2-10% of patients undergoing Laparoscopic Cholecystectomies may be converted to Open cholecystectomy due to a variety of reasons ranging from extensive inflammation, adhesions, anatomical variances, bile duct injury, retained bile duct stones, uncontrolled bleeding, poor visualisation and unclear anatomy. In our study the conversion rate was 15.73%. Conversion to open cholecystectomy should not be viewed as a complication or a failure should be taken as a sign of good judgment to complete the surgery in the safest manner possible.¹⁸ Laparoscopic cholecystectomy compared to open cholecystectomy has a lower rate of bile duct injury.¹⁹ In our study 4 patients (1.73%) suffered biliary injury out of which 3 patients underwent open Cholecystectomy and 1 patient had undergone Laparoscopic Cholecystectomy.

Diabetes and Obesity: Increasing age, obesity, and type 2 Diabetes mellitus are associated with an increased risk of gallstones.²⁰ Studies reported an increased prevalence of gall stones in patients with Diabetes.²¹ Autonomic neuropathy prompting gallbladder hypomotility and biliary stasis may clarify the reason of expanding rate of gall stones in diabetics. An Italian investigation demonstrated that the commonness of gallstone ailment is fundamentally higher in diabetic patients than in the overall public (24.8% versus.13.8%).²² Another examination from New Zealand detailed a gall stone disease pervasiveness of 32.7% among diabetic patients when contrasted with 20.8% in controls.²³ In our investigation 48 out of 231 patients (20.77%) who experienced cholecystectomies were diabetics.

CONCLUSION

Gall stone disease is more common in females (70.12%) as compared to males (29.87%). It is most common in the age group between 51-60 years (23.80%) but generally affects age group above 30 years of age (85.28%). It generally involves patients who have weight of more than 60 kg (88.74%). The highest incidence of gall stone disease occurred in patients having weight between 71-80 kg (38.96%). Gallstone disease was more common in patients who consumed a non-vegetarian diet (64.93%) and showed a predilection towards diabetics (20.77%). Inclusion and exclusion criteria were defined and 89 patients (38.52%) could be offered Laparoscopic surgery as against 142 patients (61%) who were offered Open Cholecystectomy at a peripheral hospital with an incidence of biliary injury of 4 patients (1.73%). The incidence of biliary injury was 3 patients in patients who underwent open Cholecystectomy and 1 patient in patients who had undergone Laparoscopic Cholecystectomy.

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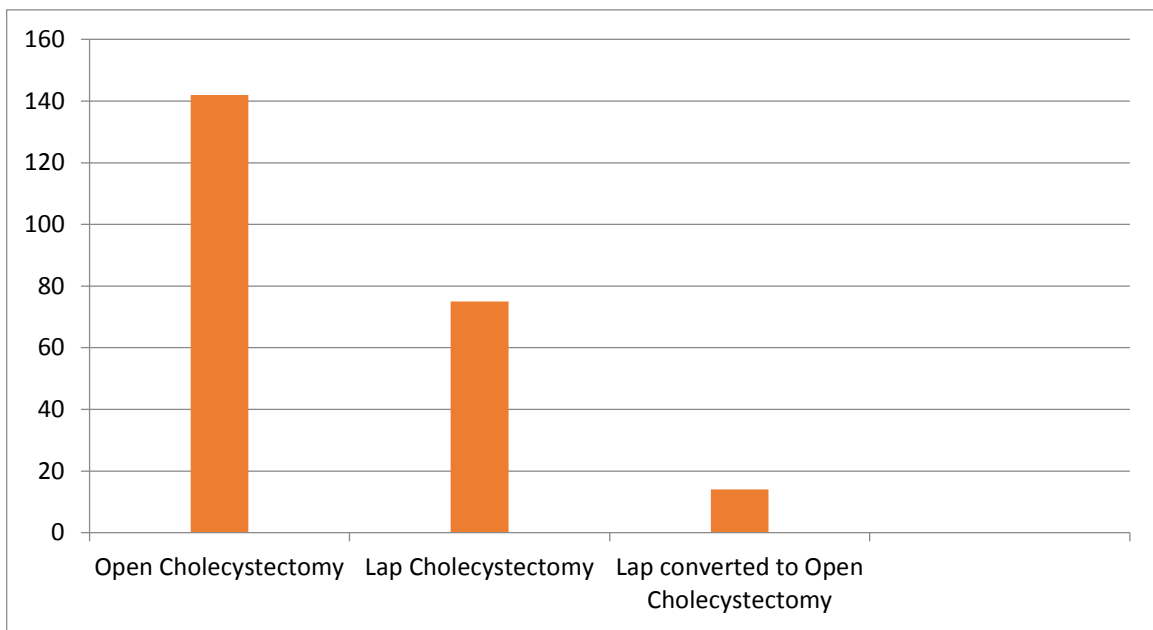


Fig 1: Figure showing the number of Open, Laparoscopic and conversion of Laparoscopic into Open surgeries:

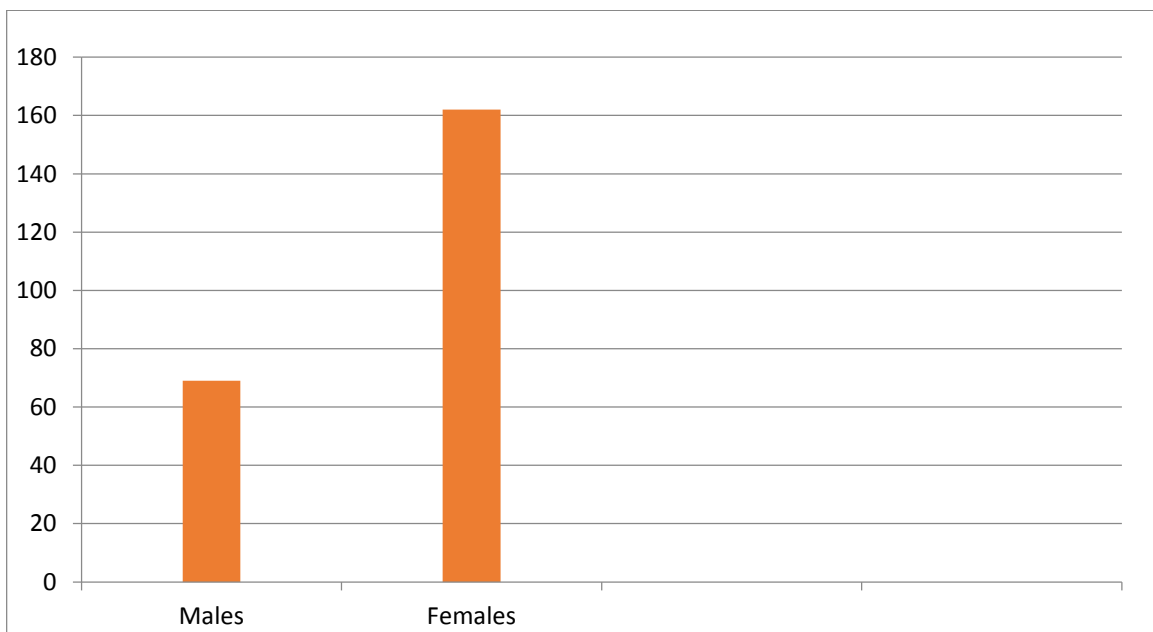


Fig 2: Gender affected by symptomatic gall stone disease who were offered surgery:

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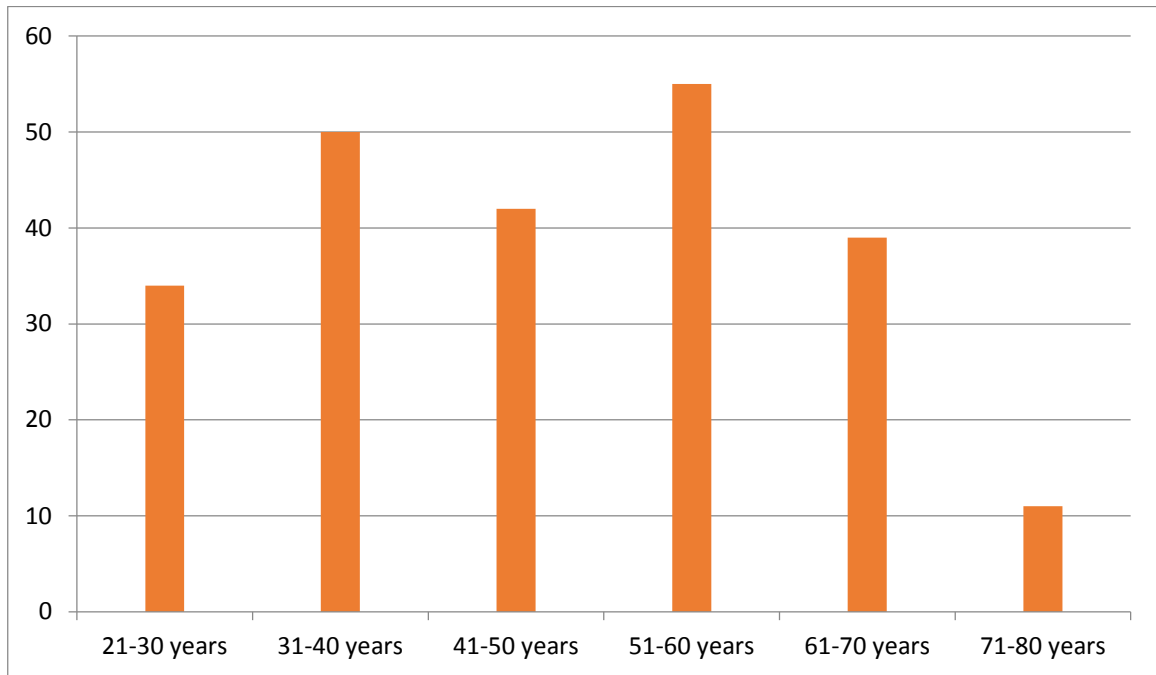


Fig 3: Age group affected who were offered surgery for symptomatic gall stone disease:

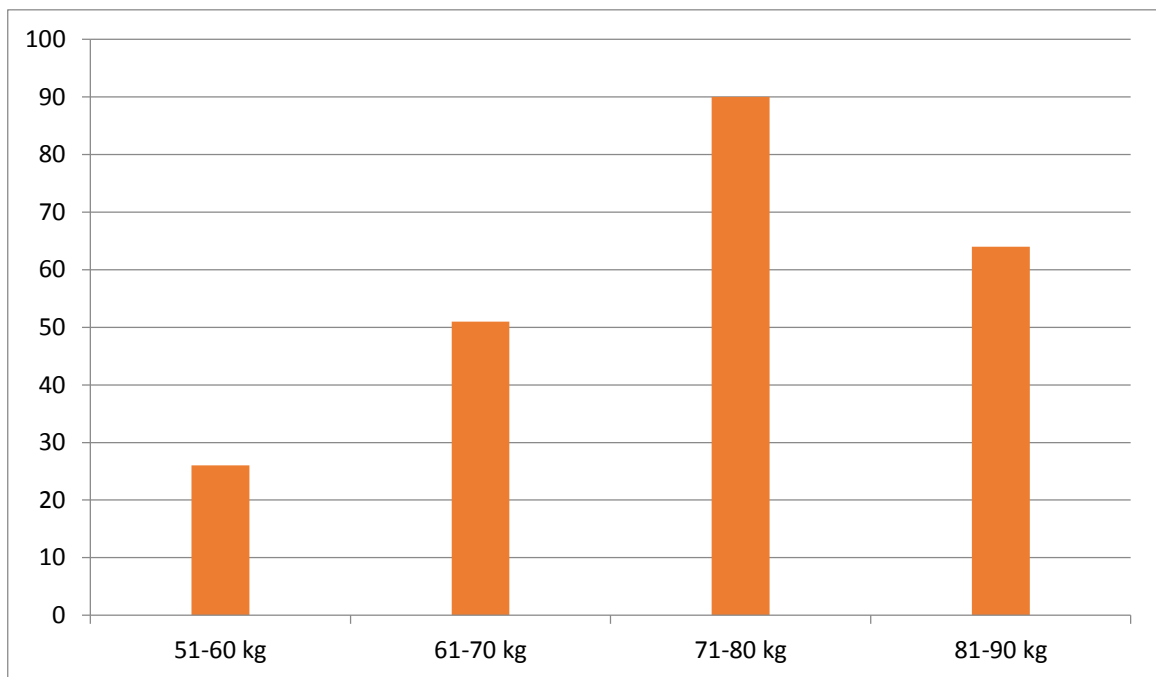


Fig 4: Weight chart of patients who were offered surgery for gall stone disease: