Research Article

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Gallstone disease menacing rural population in north India: a retrospective study of 576 cases in a rural hospital

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ABSTRACT

Background: Cholelithiasis is a commonly encountered entity by surgeons all over the globe. Its significantly higher incidence in certain regions of world like north India is a matter of concern. Patients with recurrent symptoms of gallstones are having higher rates (1-2%/year) of complications.

Methods: It is a retrospective study of 576 cases of gallstones managed in our rural institute. The aim of present study is to highlight the current status of gallstone disease and its complications in a rural population in North India.

Results: Females were predominantly involved with a female/male ratio of 3.3:1. Majority of the cases (66.14%) belonged to young (20-50 years) age group. About 65 % of the cases presented with complicated gallstones revealing extent of burden faced by our patients. Serious complications like gallbladder perforation, pancreatitis and gallbladder carcinoma were also reported in a significantly higher percentage (approx. 13%) of the study group alarming the native population. More than half of the cases (58%) were managed by laparoscopic method without significant conversion rates (2.08%). Postoperative complications were detected in about 10% of the cases; all of them were managed conservatively except single case of bile duct injury needing hepaticojejunostomy. There was paucity of data related to complications of gallstone disease in Indian population making it a worth and unique attempt.

Conclusions: Early detection and management of symptomatic gallstones is the key to prevent gallstones related complications.

Keywords: Carcinoma, Cholelithiasis, Complication, Gallstone

INTRODUCTION

Cholelithiasis constitutes a significant health problem both in developing and developed world nations. It affects 10 to 15 % of the adult population in developed world nations. It is seven times more common in north than south India. Although it is having mortality rates as low as 0.6 % but its morbidity is much higher. The incidence of gallstone disease increases after age of 40 years and it becomes 4-10 times more common in old age. Mixed stones are the commonest variety in this

region.¹ Although only about 20 % cases of gallstones are symptomatic, but once symptomatic majority (>80 %) of these patients remain so.² Approximately 3 % of the asymptomatic individual become symptomatic per year.^{4,5} Risk of gallstones related complications (1-2 % per year) such as pancreatitis, empyema of gallbladder, choledocholithiasis, mucocele, carcinoma, acute cholecystitis, gallbladder perforation etc. always endangers these patients.^{4,6,7} Although literature advocates elective cholecystectomy after first episode of biliary pain (early management), still majority of the

patients in developing countries like India neglect these symptoms. It might be due to poverty, illiteracy, scarcity of health facilities especially in rural areas, and low awareness levels about the disease. Gallstone disease also carries an inherited risk. High incidence of gallbladder carcinoma in this region of the world further demands better care and focus on this entity. There was a paucity of information on the incidence and burden of the disease in our country. We are presenting 576 cases of gallstones who presented with pathology in spectrum of gallstone disease.

METHODS

It is a retrospective study of 576 cases of gallstones who presented to our surgical unit at BPS Government Medical College for Women Khanpur Kalan Haryana India from 1st January 2012 to 30th April 2015. All cases were admitted and operated after necessary investigations except cases of advanced gallbladder carcinoma which were inoperable.

Inclusion criteria

All patients with gallstones on ultrasonography were included in the study. Data of all cases was recorded from case sheets of patients and analyzed by using SPSS 20.0 version.

RESULTS

Gallstone disease commonly involves young females. Most (>86 %) of our cases belongs to 20-60 years of age as depicted in table 1. Fourth decade is the most common age group followed by 3rd and 5th decade as illustrated in Figure 1.

Table 1: Age and sex distribution of all cases.

Age (years)	Males	Females	Total	Percentage
11-20	0	9	9	1.56
21-30	21	104	125	21.70
31-40	29	102	131	22.74
41-50	36	89	125	21.70
51-60	28	90	118	20.49
61-70	16	39	55	9.54
>70	4	9	13	2.27
Total	134	442	576	100

Oldest patient in our study was a male patient of 88 years of age while youngest patient was a 15 years female with pigment stones. Females were predominantly involved with male to female ratio of 1:3.3.

In our study about half of the cases presented with one or the other complication as shown in table 2. Chronic cholecystitis and cholesterosis were noted in about 51% of the cases while acute cholecystitis was detected in 14.24 % cases as shown in figure 2. Mucocele and empyema were also detected in about 14 % cases. Pancreatitis and choledocholithiasis were also diagnosed in about 10 % cases due to migration of gallstones in the bile duct. Most dreaded complications of gallstones like metaplasia and carcinoma of gallbladder were revealed in about 7 % cases on histopathology.

Table 2: Cases of cholecystitis and its associated complications.

Complication	Female	Male	Total	%
Chronic cholecystitis	149	56	205	35.59
Cholesterosis	81	09	90	15.63
Acute cholecystitis	68	14	82	14.24
Mucocele	39	16	55	9.54
Pancreatitis	26	16	42	7.29
Carcinoma gallbladder	21	06	27	4.69
Empyema gallbladder	19	07	26	4.51
Metaplasia gallbladder	13	03	16	2.78
CBD Stone	11	03	14	2.43
Xanthogranulomatous Cholecystitis	11	02	13	2.26
Gallbladder perforations	04	01	05	0.87
Mirrizi's syndrome	00	01	01	0.17
Total	442	134	576	100

Rare complications like xanthogranulomatous cholecystitis and gallbladder perforation were also reported in about 3% cases. One case of mirrizi's syndrome was also diagnosed incidentally in our study.

Table 3: Surgical methods used for cholecystectomy.

Cholecystectomy method	Total cases	Percentage
Open	64	11.11
Minilap	162	28.13
Clipless lap	299	51.91
Clip lap	36	6.25
No surgery	15	2.60
Total	576	100s

Out of total 576 cases, 561 patients were operated for cholecystectomy by various methods mentioned in Table 3. Clipless laparoscopic cholecystectomy was the most commonly used (51.91%) surgery in our study followed by minilap, open and clip laparoscopic cholecystectomy. Intracorporeal knotting was done in all cases of clipless laparoscopic cholecystectomies using silk 1.0 suture's A subcostal incision of size about 5-6 cm was used in all cases of minilap cholecystectomies. Postoperatively drain was used in majority (72.57%) of the cases.

Hemorrhage was most common complication noticed in about 3% of the cases. A haemorrhagic drain output of up

to 250 ml was noticed in 18 cases, majority of whom (15 cases) were females. All cases were managed conservatively. Wound infection was noticed in 14 cases and was more common in open method (10 cases) than laparoscopic surgeries. Liver injuries were also reported in 11 cases. Majority of them (8 cases) were detected in laparoscopic surgeries either during epigastric port placement or during gallbladder dissection. Grade I liver injury was detected in 8 cases while 3 patients had grade II injury. All grade I injury were managed with abgel and packing while 3 cases of grade II injury needed suturing for approximation of edges and haemostasis. Bile leak was reported in 8 cases varying from 50 -500 ml/day. Majority of them (6 cases) were managed conservatively with drain but 2 cases of persistent biliary fistula were referred to higher centre for further investigations and management.

Table 4: Postoperative complications.

Complication	Males	Females	Total	%
Hemorrhage	03	15	18	3.13
Wound Infection	02	12	14	2.43
Liver injury	01	10	11	1.91
Bile leak	02	06	08	1.39
Sinus at scar site	00	03	03	0.52
Bile duct injury	01	00	01	0.17
Incisional hernia	00	01	01	0.17
Total	09	47	56	9.72

Port site sinus was diagnosed in 3 cases. Spillage of bile and stones during gallbladder removal was the most probable cause for this complication as we do not close sheath in lap procedure routinely except in extended port site incisions. Bile duct injury was also diagnosed in one case of open cholecystectomy in a young male with acute cholecystitis. He was managed by hepaticojejunostomy at higher centre and doing well after about 3 yrs. of surgery on follow up. Single case of incisional hernia was reported in a 62 yrs. female who underwent open cholecystectomy.

DISCUSSION

Cholelithiasis in a common clinical entity all over the globe. It commonly involves fatty, fertile females of forty years of age but in present study about 45 % of the total cases presented before the age of 40 yrs. Such a high incidence below 40 yrs. in a rural population of developing country is an unusual finding. Majority of our cases were vegetarian with a low socioeconomic status. Early marriage and poor use of contraceptive pills are common in this society. High use of milk and dairy product in rural north India may be one of the reasons of high incidence of gallstones at younger age group.

Patients with symptomatic gallstones are more likely to develop complications like pancreatitis, choledocholithiasis and cholangitis etc. with an estimated

rate of 1-2 % per year. In the present study about 65 % of the cases present with complicated gallstones. It might be due to negligence of symptoms for prolonged period in our study. Poverty, illiteracy and poor access to health care facilities in rural areas are few probable reasons for delayed treatment in our study.

Gallstone disease predominantly affects female patients. Female to male ratio varies from 1.2:1 to 10:1 in Pima Indians and 2.3:1 in European females. 9,10 In present study, female to male ratio was 3.3:1.

Acute cholecystitis is a common complication of gallstones due to obstruction of cystic duct by gallstones. Most (90%) of these cases are having associated gallstones. Usually these patients have recurrent attacks of biliary colic. It may progress to mucocele, empyema or even perforation of gallbladder. In our study about 29 % of the cases presented with one of these complications. Acalculus cholecystitis typically occurs in critically ill patients, elderly men in setting of major surgery, total parenteral nutrition, trauma and burns. Biliary stasis, inflammation and ischemia are pathological steps of this cascade. These patients are more prone for complications than calculus cholecystitis. Rarely, infectious agents like cytomegalovirus, cryptosporadia and salmonella may lead to acute cholecystitis. In present study all cases were associated with gallstones.

Pancreatitis, choledocholithiasis and cholangitis are common complications due to migration of gallstones. In present study about 10% of the cases presented with these complications. Gallstones are the leading cause of pancreatitis accounting for at least one half of the 4.8-24.2 cases of pancreatitis per 1,00,000 people in western world.⁷ However its incidence in USA and Japan is 17 per 1,00,000 and 5-80 per 1,00,000 cases respectively. 11,12 Although most of these cases are resolving without significant complications but 15-30% cases have severe symptoms needing intensive care. 13 Choledocholithiasis have been reported in 10-15 % cases of gallstones. Most (95%) of these CBD stones are secondary due to migration from gallbladder. However incidence of primary CBD stones is high in Asian population due to high incidence of hepatobiliary infestation by parasitic worm resulting in secondary biliary stasis.⁸ Acute suppurative cholangitis is a common complication of CBD stone. E.coli, Klebsiella and pseudomonas are most common culprit organisms.

Carcinoma, metaplasia and xanthogranulomatous cholecystitis are most lethal complications of gallstones. Adenocarcinoma is the most common variety of gallbladder carcinoma (>80%) involving fundus (60%), body (30%) and neck (10%). In our study also all cases (4.69%) were having adenocarcinoma of gallbladder arising from fundus in most of the cases (88.89%). Gallbladder carcinoma is a rare but lethal malignancy with marked geographic variations. Although It is rare in developed world accounting only for 0.5% cases of all

gastrointestinal malignancies but high incidence of gallbladder carcinoma have been reported in certain regions of the world like north India, south Pakistan, Chilli and eastern Europe. ^{2,14,15} It is leading cause of death in Chilean women, exceeding even lung, breast and lung cancers.

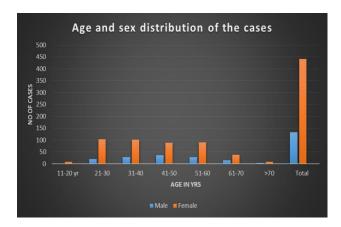


Figure 1: Age and sex distribution of the cases.

Gallbladder carcinoma is the fifth most common gastrointestinal tract malignancy in United States with 5000 cases reported annualy. It is 2-6 times greater in women than men and its incidence increases with advancing age. It has a incidence of 7.5/1,00,000 in men and 23/1,00,000 in women in Chile, Peru, north India and north American Indians. Females predominance (77.78%) was also noted in present study. Gallstones have a high risk for gallbladder carcinoma with a relative risk of 4.9. Majority (81.48%) of the cases of gallbladder carcinoma in our study were having associated gallstones.

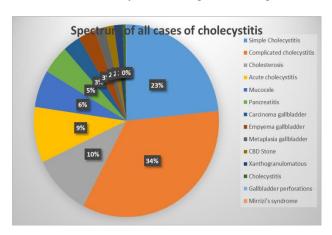


Figure 2: Spectrum of all cases of gallstones.

In present study chronic cholecystitis and cholesterosis were present in about 51% of the cases while others (49%) had one or the gallstone induced complications. Glassgow et al also reported an incidence of about 44% in California in 2000 which is comparable to present study as cholesterosis was included as incidental finding rather than complication of gallstone. ¹⁷

Leukocytosis with a 'left shift' is usually observed in acute complications like acute cholecystitis, cholangitis and pancreatitis. Serum markers like aminotransferases, alkaline phosphatase, bilirubin and amylase levels may also be elevated in these conditions. In the recent studies, serum ALT is showing a specificity of 96 % in gallstone pancreatitis with a level above 150 u/l but with a low (48%) sensitivity. ¹⁸

Tumor markers like CA-19-9 and CEA levels may be elevated in carcinoma gallbladder. Low specificity and non-availability at peripheral centres are limiting factors. Ultrasonography is the most cost-effective, available and cheap tool for assessing gallstone related complications. However, it is poor diagnostic tool for CBD stone and pancreatitis. ERCP is the best investigation with 90% sensitivity and 98 % specificity to assess CBD stone and has both diagnostic and therapeutic role. 19 Computed tomography is best modality to assess carcinoma gallbladder and pancreatitis. It is also used to classify severity of pancreatitis. But it has low sensitivity (80%) in CBD stones. MRCP is another useful non-invasive investigation which nicely delineating anatomy of hepatobiliary system. It has sensitivity and specificity of 95% and 89% respectively in detecting CBD stone.²⁰ Endoscopic ultrasound has a diagnostic accuracy of 95 % for bile duct stones.

Although laparoscopic cholecystectomy is the gold standard method of cholecystectomy but complicated cholecystitis, associated comorbid illnesses, non-availability of laparoscopic instruments and expert surgeons especially in peripheral areas of developing countries are limiting factors. In the present study conducted in rural hospital in India lap cholecystectomy was done in 58%, minilap in 28% and open in 11% of the cases due to nonavailability of lap instruments in initial part of the study. In lap cholecystectomy cases, intracorporeal knotting was used in majority (89.25%) of the cases which is the main reason of low conversion rates (2.08%) in present study despite having high (65%) incidence of complicated gallstones in our study.

Postoperative hemorrhage (<250 ml/day) was most common complication noted in about 3 % of the cases, followed by wound infection (2.4%) and minor liver injury (1.9%). All cases were managed conservatively without needing exploration. Various studies also reported almost similar results.²¹ in present study only one case (0.17%) of bile duct injury was reported which is comparable with literature (0.2-0.4%) reports.²²

CONCLUSION

Despite having a high burden of gallstone disease in north India, there is still no enough emphasis on early detection and management of this broad spectrum disease as in western world. Moreover even diagnosed cases are delaying the surgery unnecessarily inviting avoidable complications. Social awareness about the disease and providing better surgical facilities especially to rural population are the key measures to decrease the morbidity and mortality of this disease.

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