Effect of gender on symptomatic gallstone

Shah S,[1] Shrestha S,[1] Adhikari S,[2] Agrawal CS[2]
[1]Patan Academy of Health Sciences (in BPKIH during the study period), Kathmandu, Nepal
[2]BPK Institute of Health Sciences, Dharan, Nepal

ABSTRACT

Introduction: Laparoscopic cholecystectomy (LC) is generally preferred over conventional open cholecystectomy (OC) for cholelithiasis. This study was conducted to analyze the effect of gender on the severity of symptomatic gallstone disease and difficulties in laparoscopic cholecystectomy.

Method: This was a cross-sectional study from February 15, 2007 to February 14, 2008 in the department of surgery at B P Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal. All the patients with symptomatic gallstone disease who were underwent cholecystectomy were included in the study. Those patients, who underwent cholecystectomy in association with other abdominal surgery, were excluded from the study.

Result: The peak age of patients who underwent cholecystectomy for gallstone in male was 41 to 60 years and in female 21 to 40 years. Acute cholecystitis was common in male i.e. 28 (39.44%). Distended gallbladder, thickened gallbladder wall, adhesion to gallbladder, and frozen calot's triangle were common intraoperative findings in male. Duration of surgery, conversion, blood loss, and post-operative complications were similar in both gender.

Conclusion: Male are a risk factor for severe symptomatic gallstone disease which causes difficult dissection but we did not find increased morbidity or complications (intraoperative or post-operative).

Keyword: cholelithiasis, cholecystitis, pancreatitis

CORRESPONDENCE

Dr Surendra Shah
Lecturer, Department of surgery
Patan Academy of Health Sciences
E-mail: surendrashah@live.com

Introduction

Laparoscopic cholecystectomy (LC) is generally chosen over conventional open cholecystectomy (OC) for cholelithiasis, because of decreased post-operative pain, discomfort and ileus, early oral intake, shorter hospital stay, early return to normal activity and, improved cosmesis. However LC has the drawback of causing more severe form of bile duct injuries intra-operatively than OC. Conversion to OC is an attempt to avoid complications. In more than 50% of conversions, the main indication is difficulty in dissection and unclear anatomy because of adhesions or inflammation; the remaining patients require conversion because of complications or unexpected findings.[1, 2]

As patient initially visits general practice clinic, pre-operative prediction of the risk of conversion will help GPs in counseling. Factors such as old age, severe inflammation, long standing gallstones, big stone, recurrent attacks and concomitant diseases that can increase the incidence of morbidity and mortality when performing laparoscopic cholecystectomy.[3, 4]

There have been few studies on gender as predictor for difficult laparoscopic cholecystectomy. This has prompted us to conduct this study.

Method

This was a cross-sectional study conducted in the department of surgery at B P Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal for patients with gallstone disease who underwent cholecystectomy from February 15, 2007 to February 14, 2008. Those patients, who underwent cholecystectomy in association with other abdominal surgery or ASA grading >2 were excluded. The ethical clearance was obtained from the hospital ethical committee. Demographic of the patients in the form of age and sex, past history of acute cholecystitis or acute pancreatitis were recorded. Ultrasound findings were recorded. On ultrasound findings of gallbladder diameter >3 cm at greater dimension and longitudinal length >9 cm, was defined as distended GB, diameter <3 cm at greater dimension was defined as contracted GB, wall thickness >3 mm was defined as thickened GB wall. Common bile duct diameter >10 mm was defined as dilated common bile duct. Acute cholecystitis was defined as the presence of all or some of the following symptoms: right upper abdominal pain, fever (>37.5°C), leukocytosis (white blood cell count >10,000/mm^3), presence of Murphy's sign, distended gallbladder (>3mm largest diameter), and pericholecystic fluid collection. Acute gallstone pancreatitis was defined as cholelithiasis with a raised serum amylase to four folds or more of its normal level.

Cases were also classified into laparoscopic, open, or conversion group according to the type of cholecystectomy performed. Open or laparoscopic cholecystectomy was performed on the basis of patient's choices. Conversion was carried out when the anatomic structure was not defined, in presence of dense adhesions at the calot's triangle resulting in a slow progress and difficult dissection, or when there was unexpected injury to the vessel or a bile duct. Intra-operative findings (distensibility, wall thickness, adhesions, anatomical variations, calot's triangle, cystic duct, CBD and content of GB) were recorded. The operating time (from the time of skin incision to the time of skin closure), intraoperative blood loss and postoperative complications (nausea/vomiting, fever, bilious drain, hemorrhage and biliary peritonitis) were recorded.

Data was entered in Microsoft Excel and converted it into SPSS (Statistical Package for the Social Sciences) version 10. Ratio, percentage, average, variables and charts were calculated for data presentation. Chi-square test for categorical data and student *t*-test for numerical data was calculated to find out the association between dependent and independent variables. The 'p' value of less than 0.05 was regarded as significant with a confidence interval of 95%.

Result

Among 281 patients, 71 (25.27%) were male and 210 (74.73%) female. Peak age for gallstone disease in male was 41 to 60 years and in female 21 to 40 years (Table 1). There were 28 (39.44%) male and 37 (17.62%) female with acute. cholecystitis (*p=0.001*). There was no gender difference in the incidence of acute pancreatitis (Table 2). Ultrasound abdomen findings of distended or contracted gallbladder, thickened gallbladder wall, multiple as well as larger (>2cm) gallstones, and hepatomegaly were more common in male but statistically not significant (Table 3). However fatty liver was significantly common in male (*P=0.01*). Among 167 open cholecystectomies, 39 (54.93%) were male and 128 (60.95%) female. In 105 laparoscopic cholecystectomies, 30 (42.25%) were male and 75 (35.71%) female. Out of nine conversions, 2 (2.82%)

were male and 7 (3.33%) female (*P=1.000*). Among the conversion group, 2 male and 3 female were converted due to dense adhesions at the calot's triangle; and 4 female were converted due to the uncontrolled bleeding intraoperatively. Distended gallbladder, thickened gallbladder wall, adhesion to gallbladder, and frozen calot's triangle were significantly common intraoperative findings in male as compared to female (Table 4). Among male and female there were no significant differences in the duration of surgery (Table 5), blood loss during surgery (Table 6), and post-operative complications (Table 7).

Table 1. Age and gender distribution of patients undergoing cholecystectomy

Age (years)	Male	Female	Total
1-20	2	7	9
21-40	25	111	136
41-60	31	70	101
61-80	12	22	34
81-100	1	0	1
Total	71	210	281

Table 2. History of acute cholecystitis or acute pancreatitis of patients undergoing cholecystectomy

Past history	Male (n=71)	Female (n=210)	*p-value*
Acute cholecystitis	28 (39.44%)	37 (17.62%)	0.001
Acute pancreatitis	1 (1.41%)	5 (2.38%)	1.000
Total	29 (40.85%)	42 (20.00%)	0.001

Table 3. Ultrasound findings of patients undergoing cholecystectomy

USG findings	Male (n=71)	Female (n=210)	*p-value*
Gallbladder			
Normal size	35 (49.29%)	124 (59.04%)	0.152
Distended	26 (36.62%)	59 (28.10%)	0.176
Contracted	9 (12.67%)	24 (11.43%)	0.778
Thick wall	19 (26.76%)	35 (16.67%)	0.062
Stone size			
< 2 cm	53 (74.65%)	171 (81.43%)	0.219
≥ 2 cm	18 (25.35%)	39 (18.57%)	
Gallstones			
Multiple	51 (71.83%)	140 (66.67%)	
Solitary	20 (28.17%)	68 (32.38%)	0.432
GB Sludge	0 (0.0%)	2 (0.95%)	
Fatty liver	8 (11.27%)	7 (3.33%)	0.010
Hepatomegaly	4 (5.63%)	6 (2.86%)	0.279

Table 4. Intra-operative findings of patients undergoing cholecystectomy

Findings	Male (n=71)	Female (n=210)	*p-value*
Distended	42 (59.15%)	94 (44.76%)	0.036
Pericholecystic Adhesions	24 (33.80%)	45 (21.43%)	0.036
Thickened wall	22 (30.99%)	26 (12.38%)	0.001
Anatomical variations	11 (15.49%)	24 (11.43%)	0.370
Contracted gallbladder	9 (12.68%)	26 (12.38%)	0.948
Frozen Calot's triangle	8 (11.27%)	7(3.33%)	0.010
Empyema	6 (8.45%)	10 (4.76%)	0.246
Mucocele	4 (5.63%)	17 (8.10%)	0.609

Table 5. Duration of surgery of patients undergoing cholecystectomy

Variables	Mean ± SD(minutes)	*p-value*
Open (n=167)		
Male	64.1 ± 21.21	0.069
Female	57.62 ± 18.81	
Laparoscopic (n=105)		
Male	80.60 ± 26.33	0.963
Female	80.31 ± 30.03	

Table 6. Intra-operative blood loss of patients undergoing cholecystectomy

Cholecystectomies	Mean ± SD (ml)	*p-value*
Open		
Male	96.67 ± 99.14	0.412
Female	85.04 ± 69.53	
Laparoscopic		
Male	122.17 ± 192.97	0.698
Female	109.20 ± 136.47	

Table 7. Post-operative complications of patients after cholecystectomy

Complications	Male (n = 71)	Female (n = 210)	*p-value*
Vomiting	11 (15.49%)	32 (15.24%)	0.959
Fever	8 (11.27%)	16 (7.62%)	0.342
Bilious drain	6 (8.45%)	7 (3.33%)	0.076
Hemorrhage	1 (1.41%)	1 (0.48%)	0.442
Biliary Peritonitis	0 (0.00%)	1 (0.48%)	1.000
Total	26 (36.62%)	57 (27.14%)	0.130

Discussion

Our study showed the occurrence of gallstones is common in younger female while in male it is common in older age group (i.e. 21 to 40 versus 41 to 60 years). The study done by Channa et al in 2004 reported the same results.[5]

Becker et al in 1957 reported that one of the major factors influencing the prognosis of acute cholecystitis was the gender of the patients. In 1965, Hinchey et al. reported that male patients had a higher incidence of acute cholecystitis than might be expected.[6] In our study also the attack of acute cholecystitis were significantly common in male gallstone disease (39.44% vs 17.62%), (*P=0.001*).

Russell et al. reported that symptomatic cholelithiasis should be considered a different, more virulent disease in male patients.[7] Difficulty dissection of gallbladder bed was more often in patient with past history of acute cholecystitis, thickened gallbladder wall, and frozen calot's or adhesion to gallbladder. Difficulty in extraction of dissected gallbladder from port site was associated with a calculus size >1 cm but not with number of stones.[8] The study done by Tarcoveanu E et al in 2002 reveals that male suffer from a severe form of symptomatic cholelithiasis that raises difficulties when laparoscopic cholecystectomy is performed.[9]

In 2002 Heng-Hui Lein et al. reported that there was no significant difference in the duration of the surgery between genders in patients who had undergone elective laparoscopic cholecystectomy.[10] In 2005 Jagdish Nachnani et al reported that the bleeding occurred more often in patients having gallbladder wall thickness exceeding 3 mm, and those with past history of acute cholecystitis or acute pancreatitis.[8] In our study, distended or contracted gallbladder, thickened gallbladder wall, multiple as well as larger (>2cm) gallstones, hepatomegaly and fatty liver were common ultrasound findings in male. Distended gallbladder, thickened gallbladder wall, adhesion to gallbladder, and frozen calot's triangle were significantly common intraoperative findings in male as compared to female, which are predictor for difficult dissection for laparoscopic cholecystectomy. But our study did not show significant differences in the operating time, conversion rate and intraoperative blood loss between male and female. Eldar et al found male gender to be an independent risk factor associated with increased complications. [6] But our study did not show significantly increased post operative complications in male.

Conclusion

Male gender is a risk factor for severity in symptomatic gallstone disease which causes difficult dissection. but we did not find increased morbidity or complications (intraoperative or post-operative).

Reference

1. Shinichi Sakuramoto, Shigeru Sato, Takehiko Okuri. Preoperative evaluation to predict technical difficulties of laparoscopic cholecystectomy on the basis of histological inflammation findings on resected gallbladder. American Journal of Surgery. 2000; 179 (2):114-21.
2. Nuri Aydın Kama, Murat Kologlu, Mutlu Doganay. A risk score for conversion from laparoscopic to open. Am J of Surg. 2001;181(6):520-5.
3. Alponat A, Kum CK. Predictive factors for conversion of laparoscopic cholecystectomy. World J. Surg.1997;21:629–33.
4. Zucker KA, Flowers JL. Laparoscopic management of acute cholecystitis. Am J Surg. 1993;165:508–14.
5. Naseem A. Channa, Fateh D. Khand. Surgical incidence of cholelithiasis in Hyderabad and adjoining area. Pak J Med Sci. 2004;20(1):13-7.
6. Heng-Hui Lein. Male gender: Risk factors for severe symptomatic cholelithiasis. World J Surg. 2002;26:598-601.
7. John C, Russell. Symptomatic Cholelithiasis: A different disease in men? Ann. Surg. 1998;227:195–200.
8. Nachnani J. Preoperative prediction of difficult laparoscopic cholecystectomy using clinical and ultrasonographic parameters. Indian J Gastroenterol. 2005;24:16-8.
9. Tarcoveanu E, Epure O. Male gender—difficulty factors in cholecystectomies for cholelithiasis. Rev Med Chir Soc Med Nat Iasi. 2002;106(4):768-72.
10. Fried GM, Barkus JS, Sigman HH. Factors determining conversion to laparotomy in patients undergoing laparoscopic cholecystectomy. Am. J. Surg. 1994;167(1):35–41.