

Article

Single versus multiple gall stone disease in patients undergoing laparoscopic cholecystectomy

Harpreet Singh^{1,*} and Arvind Sharma¹

¹ Department of General Surgery, Autonomous State Medical College & Society, Hardoi, Uttar Pradesh, India.

* Correspondence: harpreet_singh_22@yahoo.com

Academic Editor: Nazia Tauheed

Received: 12 April 2021; Accepted: 18 September 2021; Published: 30 September 2021.

Abstract: The aim of this paper is to compare single versus multiple gall stone disease in patients undergoing laparoscopic cholecystectomy. A total of one hundred and thirty patients (males- 52, females- 78) within age group 20-65 years presented with cholelithiasis were divided into 2 groups. Group 1 comprised of single stone patients and group II had multiple stones. Each group had 65 patients. Parameters compared were symptoms and operative findings between both groups, Analysis of results was carried with chi0 square test. Most common clinical symptoms found to be fever in both groups (87%- group 1, 90%- group 2). Other symptoms were dyspepsia seen in 25% and 30%, nausea/ vomiting in 45% and 38% in group 1 and 2 patients respectively. Females were commonly affected and maximum case were observed in age group 40-50 years. Multiple gall stones patients had more symptoms and prevalence of conversion to open surgery was more in these patients. Group 1 patients showed gall bladder distention in 56 and group 2 in 62 patients, gall bladder contraction was seen in 6 patients in group 1 and 3 in group 2, adhesions were exhibited by 11 patients in group 1 and 20 in group 2. 4 patients in group 2 converted to open surgery. Gangrenous gall bladder was seen in 1 in group 1 and 5 in group 2.

Keywords: Gall bladder; Cholelithiasis; Open surgery; Gall bladder distention.

1. Introduction

Gallstone disease is considered a benign disease affecting large amount of population. The number of patients with gall bladder diseases is on rise. It demands major abdominal surgery. Among various diseases [1]. Cholelithiasis, or gallstones is most common one. It is evident in literature that the occurrence of gallstones increases with age [2]. Risk factors includes obesity, diabetes mellitus (DM), women gender, rapid weight cyclers, and patients on hormone therapy or taking oral contraceptives. Until and unless, gall stones pose pain, they remain asymptomatic [3]. Most of the symptomatic patients shows symptoms of biliary colic due to the intermittent obstruction of the cystic duct by a stone. Patient experience moderate to severe pain which lasts one to five hours. Pain is usually localized to the epigastrium or right upper quadrant of the abdomen [4].

The occurrence of fever along with colic pain with high white blood cell count (WBCs) raises the suspicion of complications such as acute cholecystitis, gallstone pancreatitis, and ascending cholangitis [5]. The diagnosis of gall stones is by ultrasonography (USG). USG is useful in detection of gall stones [6].

The management of cases of gall stones includes laparoscopic cholecystectomy. It is gold standard treatment options for symptomatic and complicated gallstones [7]. Advantages of this modality is shorter convalescence period and short hospital stay comparing to open cholecystectomy [8]. Percutaneous cholecystostomy is an alternative for patients who are critically ill with gallbladder empyema and sepsis. It is found that adhesions are amongst the common reasons for open conversion of laparoscopic cholecystectomy [9]. We attempted this study to compare single versus multiple gall stone disease in patients undergoing laparoscopic cholecystectomy.

2. Methodology

The approval for this prospective, comparative study was obtained from Ethical and review authority of the institute. A total of one hundred and thirty patients (males- 52, females- 78) within age group 20-65 years presented with colic pain to general surgery department. All were diagnosed with cholelithiasis using USG.

All were those who gave their consent for the part of this study. Randomization of them into 2 groups was performed. Group 1 comprised of single stone patients and group II had multiple stones. A routine laboratory investigation comprised of Hemoglobin % (Hb), total leucocyte count (TLC), differential leucocyte count (DLC), random blood sugar (RBS), serum urea and creatinine was carried out. Apart from this, Assessment of serum bilirubin, serum amylase, alkaline phosphate, bilirubin total, renal and liver function test was determined. Before operating the patients, electrocardiography (ECG) and chest X-ray (CXR) were performed.

Advanced imaging such as ultrasonography of abdomen (USG) was done to study the nature, number, size of the gall stones, gall bladder wall thickness, CBD, intra hepatic biliary radicals status, any other relevant findings. Computed tomography (CT) scan and magnetic resonance imaging (MRI) was carried as and when required. Results after recording all relevant data were subjected for statistical inferences using chi- square test. The level of significance was significant if p value is below 0.05.

3. Results

Maximum cases were seen in age group 40-50 years in both groups (group 1- males- 16, females- 20, group 2- males- 15, females- 20). Minimum cases were seen in age group 20-30 years (group 1- males- 5, females- 6, group 2- males- 2, females- 5). A non- significant in gender was observed ($P > 0.05$), see Table 1.

Table 1. Age and gender distribution of cases used in study

Age group (Years)	Group 1 (M:F)	Group 2 (M:F)	P value
20-30	5:6	2:5	>0.05
30-40	2:10	5:6	
40-50	16:20	15:20	
50-65	4:8	3:3	

Most common clinical symptoms found to be fever in both groups (87%- group 1, 90%- group 2). Other symptoms were dyspepsia seen in 25% and 30%, nausea/ vomiting in 45% and 38% in group 1 and 2 patients respectively. A non- significant in gender was observed ($P > 0.05$). (Table 2, Figure 1).

Table 2. Comparison of clinical features in groups

Clinical findings	Group 1	Group 2	P value
Fever	87%	90%	>0.05
Dyspepsia	25%	30%	
Nausea/ vomiting	45%	38%	
Icterus	6%	8%	
Mass	12%	11%	

Group 1 patients showed gall bladder distention in 56 and group 2 in 62 patients, gall bladder contraction was seen in 6 patients in group 1 and 3 in group 2, adhesions were exhibited by 11 patients in group 1 and 20 in group 2. 4 patients in group 2 converted to open surgery. Gangrenous gall bladder was seen in 1 in group 1 and 5 in group 2. A significant difference was observed ($P < 0.05$), see Table 3.

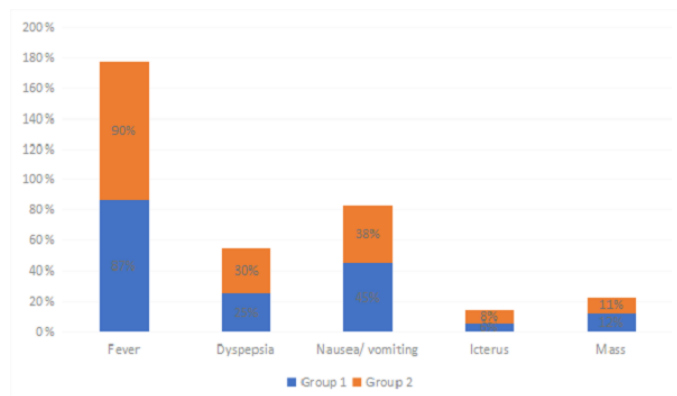


Figure 1. Graphical comparison of clinical features in groups

Table 3. Operative findings

Operative findings	Group 1	Group 2	P value
Gall bladder distension	56	62	<0.05, Significant
Gall bladder contraction	6	3	
Adhesion	11	20	
Gangrenous gall bladder	1	5	
Conversion to open surgery	0	4	

4. Discussion

Gallstone disease (cholelithiasis) is one of the most common gastrointestinal disorders in today's life. The prevalence of gallstones is found to be approximately 10%-15% [10]. Women exhibits higher prevalence compared to males over the age of 40 years [11]. In most people, gallstones are asymptomatic. About 20% of people with gallstones experience pain and complications [12]. There is always debate regarding which method is better for the management of gall bladder stones [13]. Laparoscopic cholecystectomy is recent treatment modality which overcome the limitation of open surgery [14]. The most common complications associated with cholelithiasis are severe acute cholecystitis, which may lead to complications such as empyema, obstructive jaundice due to the obstruction of the common bile duct, acute cholangitis and acute pancreatitis [15]. In this study we compared single versus multiple gall stone disease in patients undergoing laparoscopic cholecystectomy.

Our study comprised of 130 patients divided into 2 groups of 65 each based on the presence of single or multiple stones. It was found in our study that maximum cases were seen in age group 40-50 years in both groups (group 1- males- 16, females- 20, group 2- males- 15, females- 20). Minimum cases were seen in age group 20-30 years (group 1- males- 5, females- 6, group 2- males- 2, females- 5). Mofti *et al.*, [16] evaluate 692 consecutive patients undergoing cholecystectomy of whom 80 had single stone. Only about 30% asymptomatic patients need surgery in their life-time.

It was observed that most common clinical symptoms were fever in both groups seen among 87% in group 1 and 90% in group 2 patients. Other symptoms were dyspepsia seen in 25% and 30%, nausea/ vomiting in 45% and 38% in group 1 and 2 patients respectively. A study by Zhang *et al.*, [17] suggested that LC is the gold standard in the treatment for cholelithiasis. Prophylactic cholecystectomy is justified only high suspicion of life. They found that developing mucocele, empyema gall bladder perforation and post-operative complication were more common in patients with solitary stone. Gabriel *et al.*, [18] in their study observed that 61 (26.1%) LC required conversion.

It was seen in our study that 56 patients in group 1 and 62 in group 2 showed gall bladder distention, gall bladder contraction was seen in 6 patients in group 1 and 3 in group 2, adhesions were exhibited by 11 patients in group 1 and 20 in group 2. 4 patients in group 2 converted to open surgery. Gangrenous gall bladder was seen in 1 in group 1 and 5 in group 2. A study conducted by Raja *et al.*, [19] in year 2020 where patients of gall bladder stones were divided into 2 groups as single or multiple stones. In both groups, female incidence, 41-50

years age group is more common. Both groups presented with abdominal tenderness (RUQ), fever more in group-1, dyspepsia more in group-2 and icterus more in group-2. Complications of gall stones as suggested by USG of abdomen like cholecystitis, gangrenous cholecystitis, gallbladder perforation, empyema of gallbladder were more in multiple than single stone patients. Group II had difficult cholecystectomies based on the above timings noted intraoperatively.

The natural course of gallstone disease is benign, with relatively low progression from asymptomatic disease to symptomatic disease. Natural history studies have shown low mortality from gallstone disease with typically less than 1% of people dying from gallbladder-related causes. Festi *et al.*, study (2010) [20] revealed that the overall frequency of symptom development in asymptomatic people was around 20% over a long follow-up period (mean 8.7 years). In people with symptomatic uncomplicated gallstone disease, the annual rates of developing complications have been reported to be as low as 1%-3%. The Italian Group for the Epidemiology and Prevention of Cholelithiasis Study reported an annual incidence of complications of 0.7% for symptomatic people.

5. Conclusion

Results of our study showed that females were commonly affected and maximum case were observed in age group 40-50 years. Multiple gall stones patients had more symptoms and prevalence of conversion to open surgery was more in these patients.

Author Contributions: All authors contributed equally to the writing of this paper. All authors read and approved the final manuscript.

Conflicts of Interest: "The authors declare no conflict of interest."

References

- [1] Barbara, L., Sama, C., Labate, A. M. M., Taroni, F., Rusticali, A. G., Festi, D., ... & Nardin, F. (1987). A population study on the prevalence of gallstone disease: the Sirmione Study. *Hepatology*, 7(5), 913-917.
- [2] Everhart, J. E., Khare, M., Hill, M., & Maurer, K. R. (1999). Prevalence and ethnic differences in gallbladder disease in the United States. *Gastroenterology*, 117(3), 632-639.
- [3] Heaton, K. W., Braddon, F. E., Mountford, R. A., Hughes, A. O., & Emmett, P. M. (1991). Symptomatic and silent gall stones in the community. *Gut*, 32(3), 316-320.
- [4] Williams, J. G., Roberts, S. E., Ali, M. F., Cheung, W. Y., Cohen, D. R., Demery, G., ... & Williams, J. C. (2007). Gastroenterology services in the UK. The burden of disease, and the organisation and delivery of services for gastrointestinal and liver disorders: a review of the evidence. *Gut*, 56(suppl 1), 1-113.
- [5] McSherry, C. K., Ferstenberg, H., Calhoun, W. F., Lahman, E., & Virshup, M. (1985). The natural history of diagnosed gallstone disease in symptomatic and asymptomatic patients. *Annals of Surgery*, 202(1), 59-63.
- [6] Lal, P., Agarwal, P. N., Malik, V. K., & Chakravarti, A. L. (2002). A difficult laparoscopic cholecystectomy that requires conversion to open procedure can be predicted by preoperative ultrasonography. *Journal of the Society of Laparoendoscopic Surgeons*, 6(1), 59-63.
- [7] Lipman, J. M., Claridge, J. A., Haridas, M., Martin, M. D., Yao, D. C., Grimes, K. L., & Malangoni, M. A. (2007). Preoperative findings predict conversion from laparoscopic to open cholecystectomy. *Surgery*, 142(4), 556-565.
- [8] Tucker, L., & Tangedahl, T. N. (1979). Manifestations of gallstone disease. *Postgraduate Medicine*, 66(4), 179-184.
- [9] Kanaan, S. A., Murayama, K. M., Merriam, L. T., Dawes, L. G., Prystowsky, J. B., Rege, R. V., & Joehl, R. J. (2002). Risk factors for conversion of laparoscopic to open cholecystectomy. *Journal of Surgical Research*, 106(1), 20-24.
- [10] Schirmer, B. D., Winters, K. L., & Edlich, R. (2005). Cholelithiasis and cholecystitis. *Journal of Long-Term Effects of Medical Implants*, 15(3), 329-338.
- [11] Isoda, N., Ido, K., Kawamoto, C., Suzuki, T., Nagamine, N., Ono, K., ... & Sugano, K. (1999). Laparoscopic cholecystectomy in gallstone patients with acute cholecystitis. *Journal of Gastroenterology*, 34(3), 372-375.
- [12] Jayanthi, V., Surendran, R., Prasanthi, R., Prithiviraj, C. A., & Srinivasan, V. (2002). Surgical practice in symptomatic and asymptomatic gallstone disease. *Indian Journal of Gastroenterology*, 21(4), 142-144.
- [13] Berhane, T., Vethrus, M., Hausken, T., Olafsson, S., & Søndena, K. (2006). Pain attacks in non-complicated and complicated gallstone disease have a characteristic pattern and are accompanied by dyspepsia in most patients: the results of a prospective study. *Scandinavian Journal of Gastroenterology*, 41(1), 93-101.
- [14] Schmidt, M., Dumot, J. A., Søreide, O., & Søndena, K. (2012). Diagnosis and management of gallbladder calculus disease. *Scandinavian Journal of Gastroenterology*, 47(11), 1257-1265.

- [15] Vohra, R. S., Pasquali, S., Kirkham, A. J., Marriott, P., Johnstone, M., Spreadborough, P., ... & Kaptanis, S. (2016). Population-based cohort study of outcomes following cholecystectomy for benign gallbladder diseases. *British Journal of Surgery*, 103(12), 1704-1715.
- [16] Mofti, A. B., Al-Momen, A., Suleiman, S. I., Ismail, S. A., Jain, G. C., Hussein, N. M., & Fayed, H. M. (1994). The single gallbladder stone-is it innocent?. *Annals of Saudi Medicine*, 14(6), 471-473.
- [17] Raja, C. D. K., Keerthi, D., Kiran, A. S., Aravind, G., Raja, S., Karthik, G. M., ... & Kumar, N. K. (2020). Comparative study of single versus multiple gallstone disease in KGH, Visakhapatnam. *International Surgery Journal*, 7(10), 3370-3373.
- [18] Gabriel, R., Kumar, S., & Shrestha, A. (2009). Evaluation of predictive factors for conversion of laparoscopic cholecystectomy. *Kathmandu University Medical Journal*, 7(1), 26-30.
- [19] Zhang, W. J., Li, J. M., Wu, G. Z., Luo, K. L., & Dong, Z. T. (2008). Risk factors affecting conversion in patients undergoing laparoscopic cholecystectomy. *ANZ Journal of Surgery*, 78(11), 973-976.
- [20] Festi, D., Reggiani, M. L. B., Attili, A. F., Loria, P., Pazzi, P., Scaioli, E., ... & Colecchia, A. (2010). Natural history of gallstone disease: Expectant management or active treatment? Results from a population-based cohort study. *Journal of Gastroenterology and Hepatology*, 25(4), 719-724.



© 2021 by the authors; licensee PSRP, Lahore, Pakistan. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).