



## Original Research Article

# GENDER BASED STUDY (MALE VS FEMALE) OF LAPAROSCOPIC CHOLECYSTECTOMY- A RETROSPECTIVE OBSERVATIONAL STUDY IN A TERTIARY CARE CENTRE

Saikalyan Gupta A<sup>1</sup>, Siva Sankar T<sup>2</sup>, Subhodaya R<sup>3</sup>, Neeraja Rudrawar<sup>4</sup>, H.C.Kiran<sup>5</sup>, Atmajita Chatterjee<sup>6</sup>, Pragati Sharma<sup>7</sup>

<sup>1</sup>Professor, Department of General Surgery, Vydehi Institute of Medical Sciences, Whitefield, Bangalore, Karnataka, India.

<sup>2</sup>Assistant Professor, Department of General Surgery, St Peter's medical college, Hosur Tamilnadu, India.

<sup>3</sup>Assistant Professor, Department of General Surgery, Vydehi Institute of Medical Sciences, Whitefield, Bangalore, Karnataka, India.

<sup>4,5</sup>Junior Resident, Department of General Surgery, Vydehi Institute of Medical Sciences, Whitefield, Bangalore, Karnataka, India.

<sup>6</sup>Postgraduate, Resident, Department of General Surgery, Vydehi Institute of Medical Sciences, Whitefield, Bangalore, Karnataka, India.

<sup>7</sup>MBBS, Basaveshwara medical College and research centre, Chitradurga.

Received : 29/04/2024  
Received in revised form : 24/06/2024  
Accepted : 12/07/2024

**Corresponding Author:**

**Dr. H.C.Kiran,**  
Junior Resident, Department of  
General Surgery, Vydehi Institute of  
Medical Sciences, Whitefield,  
Bangalore, Karnataka, India.  
Email: kiranhc14@gmail.com

DOI: 10.70034/ijmedph.2024.3.20

Source of Support: Nil,  
Conflict of Interest: None declared

Int J Med Pub Health  
2024; 14 (3); 113-117

**ABSTRACT**

**Background:** Laparoscopic cholecystectomy is gold standard procedure for routine gall bladder removal nowadays. It has become the preferred surgery of choice for patients with symptomatic cholelithiasis in the last two decades due to its shorter duration of hospital stay, reduced post operative morbidity and better cosmesis

**Materials and Methods:** A retrospective observational study was done in 75 patients who underwent laparoscopic cholecystectomy in Vydehi Institute of Medical Sciences & Research Centre Bangalore. Patients were divided into 2 groups based on gender and comparison in terms of age of presentation, intra operative complications, duration of surgery, post operative complications, POD 1 pain was done. The duration of hospital stay was also compared

**Results:** The duration of surgery was significantly greater in males (50.65 +/- 8.73) than female group (37.80 +/- 8.78,  $p < 0.001$ ). Normal anatomy was significantly in greater proportion in females (63.6% ) than males (25.0% ,  $p < 0.001$ ). Intra operative complications such as bile spillage (12.9%), bleeding (6.5%) and bile leak (3.2% ) was significantly more in male than females ( $p < 0.42$ ). The hospital stay and post op day 1 pain was seen more in males than females. There was no difference between the genders with respect to age (0.118) and post operative complications ( $p = 0.222$ )

**Conclusion:** This study suggests that male gender can be a predictor of difficult laparoscopic cholecystectomy.

**Keywords:** Laparoscopic cholecystectomy, Cholelithiasis,

**INTRODUCTION**

Laparoscopic cholecystectomy is a minimally invasive surgical procedure for removal of diseased gall bladder. It has become the preferred surgery of choice for patients with symptomatic cholelithiasis in the last two decades due to its shorter duration of hospital stay, reduced post-operative morbidity and better cosmesis. Over the last 2 decades identification of risk factors accounting to peri operative complications in laparoscopic cholecystectomy has

been an area of interest. Of the multiple studies done, there has been a general agreement that increasing age, acute cholecystitis, morbid obesity, previous abdominal surgery are among the most important risk factors.

Male gender has been identified as one of the risk factors for intra-operative difficulty and is known to influence postoperative morbidity and recovery time in recent times. However gender as an independent risk factor for peri operative complication is yet to be established. In this study we compare laparoscopic

cholecystectomy done in male patients and female patients in terms of intra operative difficulties encountered, duration of procedure, post-operative day 1 pain (VAS Score), post-operative complications, duration of hospital stay in the cases operated by experienced surgeons in Vydehi Institute of Medical Sciences during the period from June 2022 to January 2024.

## MATERIAL AND METHODS

The study is a retrospective observational study among all the patients who underwent elective laparoscopic cholecystectomy in Vydehi Institute of Medical Sciences during the period from October 2022 to January 2024. Excluded patients with (a) previous abdominal surgery (b) morbid obesity (c) gall bladder carcinoma (biopsy proven) (d) acute cholecystitis (e) obstructive jaundice (f) CBD stones. Patients were divided into 2 groups based on gender and were compared in terms of age of presentation, intra operative complications, duration of surgery, post-operative complications, POD 1 pain, duration of hospital stay. Data was collected from previous hospital records.

### Statistical Analysis

The data were analysed using IBM SPSS version 25. Continuous and categorical data were presented as means and percentages and compared against the two genders using unpaired t-test and chi square test respectively. Comparison of VAS scores against gender were done using Wilcoxon sign rank test. A p value of  $\leq .05$  was considered significant for all analysis

## RESULTS

The study was conducted in Vydehi Institute of Medical Sciences, Bengaluru during the period from October 2022 to January 2024. A total of 75 patients were studied and were divided into two groups based on gender and were compared in terms of age of presentation, intra operative complications, duration of surgery, post-operative complications, POD 1 pain, duration of hospital stay. Data was collected from previous hospital records.

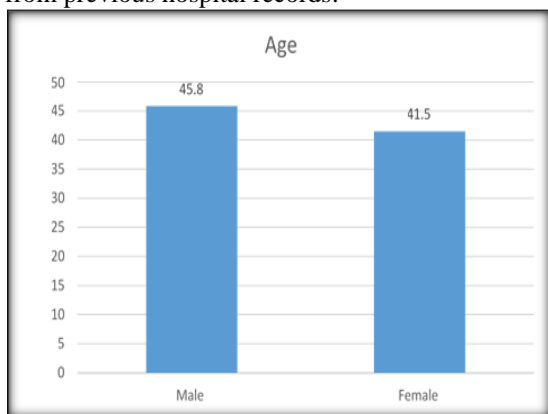


Figure 1: Inter-group comparison of age

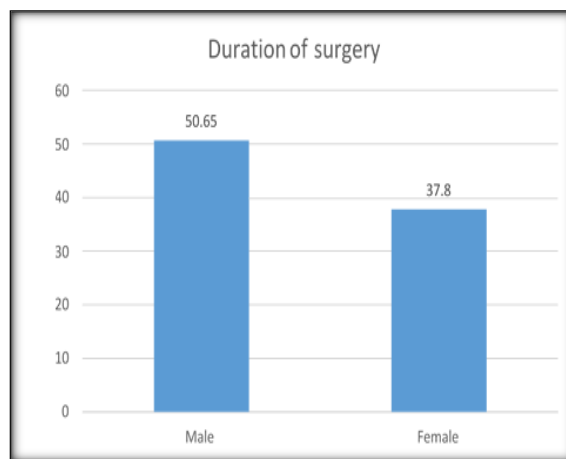


Figure 2: Inter-group comparison of duration of surgery

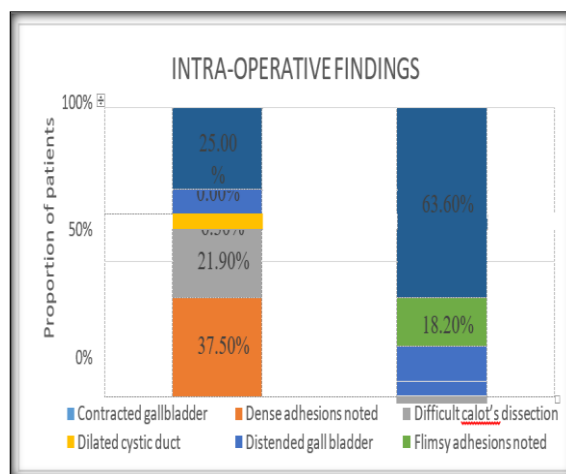


Figure 4: Inter-group comparison of intra-operative findings

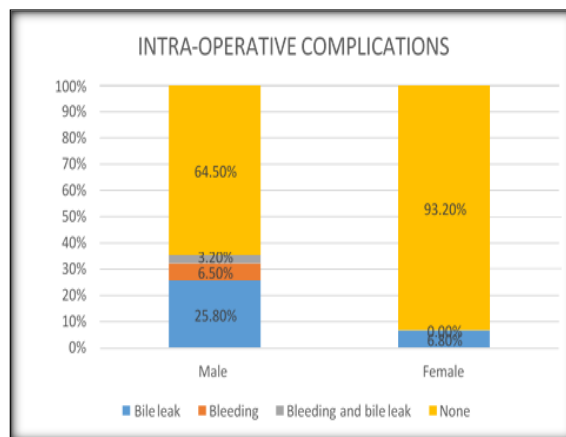


Figure 5: Inter-group comparison of intra-operative complications

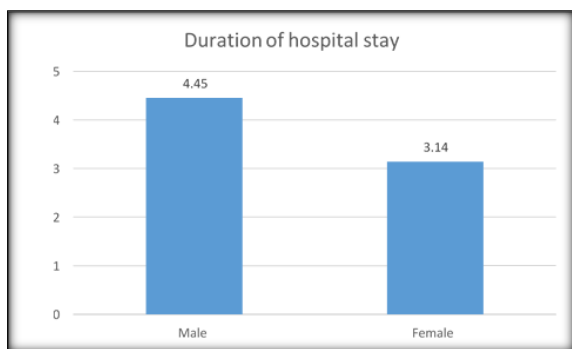


Figure 6: Inter-group comparison of duration of hospital stay

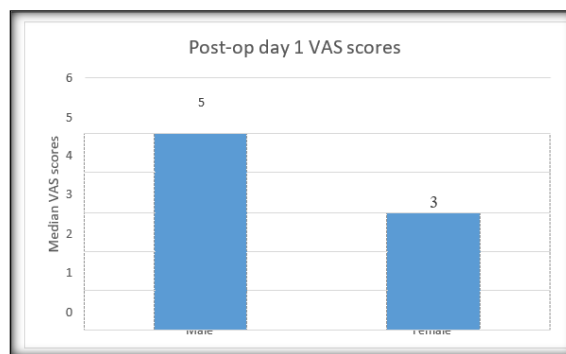


Figure 7: Inter-group comparison of post-op day 1 VAS scores

Table 1: Inter-group comparison of age using unpaired t-test

Group	Mean	Standard deviation	P value
Male	45.8	10.4	.118
Female	41.5	12.1	

No significant difference in age was detected between the two groups.

Table 2: Inter-group comparison of duration of surgery (in minutes) using unpaired t-test

Group	Mean	Standard deviation	P value
Male	50.65	8.73	<.001
Female	37.80	8.78	

Duration of surgery was significantly greater in males.

Table 3: Inter-group comparison of intra-operative findings

Group	N	%	Contracted gallbladder	Dense adhesions noted	Difficult Calot's dissection	Dilated cystic duct	Distended gall bladder	Flimsy adhesions noted	Normal anatomy	P value
Male	N		0	12	7	2	3	0	8	<.001
	%		0.0%	37.5%	21.9%	6.3%	9.4%	0.0%	25.0%	
Female	N		1	0	1	0	6	8	28	
	%		2.3%	0.0%	2.3%	0.0%	13.6%	18.2%	63.6%	

Normal anatomy was evident in a significantly greater proportion of females in the study.

Table 4: Inter-group comparison of intra-operative complications

Group	N	%	Bile spillage	Bleeding	Bleeding and bile leak	None	P value
Male	N		4	2	1	24	.042
	%		12.9%	6.5%	3.2%	75%	
Female	N		1	0	0	41	
	%		2.3%	0.0%	0.0%	93.2%	

Intra operative complications were seen in a significantly greater proportion of males, while most females did not have any intra-operative complications.

Table 5: Inter-group comparison of post-operative complications

Group	N	%	Biliary peritonitis	None	PONV	P value
Male	N		1	28	2	0.222
	%		3.2%	90.3%	6.5%	
Female	N		1	43	0	
	%		2.3%	97.7%	0.0%	

A significant difference in the number of patients with each post-operative complication was failed to be detected between the two genders.

Table 6: Inter-group comparison of duration of hospital stay (in days) using unpaired t-test

Group	Mean	Standard deviation	P value
Male	4.45	1.387	<.001
Female	3.14	.554	

Hospital stay was significantly greater in males.

**Table 7: Inter-group comparison of post-op day 1 VAS scores using Wilcoxon sign rank test**

Group	Post—op day 1 VAS scores (median)	Mean rank	P value
Male	5	50.61	<.001
Female	3	29.11	

Median VAS scores were significantly greater in males.

## DISCUSSION

Laparoscopic cholecystectomy became the gold standard procedure to treat symptomatic gallstone in few years after its introduction due to its multitude of advantages.<sup>[1]</sup> However, some factors like patients advancing age, severe inflammation, history of previous abdominal surgery, obesity, male gender, severe cardiovascular disease, complications during surgery etc often necessitate conversion of laparoscopic cholecystectomy to open cholecystectomy.

Several research studies have evidenced that higher surgical difficulties experience in men during laparoscopic cholecystectomy and increased conversion rates as compared to women.<sup>[2]</sup> Numerous epidemiological studies across the globe have reported increased incidence of cholelithiasis, in women especially during fertile years. This can be attributed to raised estrogen levels during pregnancy, use of oral contraception forms or estrogen replacement therapy which leads to hypercholesteremia.<sup>[2,3]</sup>

In our study, majority of the patients were females. Similarly, higher proportion of women patients were observed in studies by Bazoua et al. (72.6%)<sup>9</sup>, Al-Mulhim et al. (85.1%)<sup>10</sup>, Kumar et al.(89.10%),<sup>[11]</sup>, Zisman et al. (81.15%)<sup>7</sup> and Bahadur A et al.(82.32%).<sup>[2,7-10]</sup>

In our study the mean age of male was (45.8 +/- 10.4) and mean age of female was (41.5 +/- 12.1), there was no significant difference in age detected between the two groups.

Several authors have reported that males were significantly older and had a more delayed presentation of symptomatic cholelithiasis.<sup>[4,6,7]</sup> Lein stated that the reason for delayed presentation may be due to psychological and social factors and it any be that higher pain threshold in males does result in later presentation at a more advanced stage of disease than females. This point was further supported by the findings of Yol,<sup>[8]</sup> who observed that inflammatory process and fibrosis in acute cholecystitis was more severe in male patients.<sup>[4,6,8]</sup> Thesbjerg et al,<sup>[5]</sup> have reported that the main reason for higher laparoscopic conversion in men was due to more frequent rate of acute cholecystitis and its sequelae. Intense inflammation and firm adhesion of the gall bladder with the surrounding tissues due to cholecystitis make dissection and identification of anatomy difficult.<sup>[1,5]</sup>

The findings of our study showed dense adhesions and difficult calot's dissection were noted in males.

Normal anatomy was evident in a significantly greater proportion of females in the study.

Men in this study encountered more unwanted intra-operative complication than women.

The incidence of post-operative complications in both male and female groups of this study was very less as compared to the other studies. Also, the intergroup difference was not statistically significant (p=0.22) which is in an agreement to a study by Kumar et al.

In this study, postoperative hospital stay was significantly more in male patients than female patients.

Not many studies have shown compared POD1 VAS score between male and female patients, in our study POD1 VAS score was significantly higher in male patients compared to female patients, probably due to more dissection or increased tissue handling in males compared to females.

## CONCLUSION

This study suggests that male gender can be a predictor of difficult laparoscopic cholecystectomy. In this study, increased incidence of cholelithiasis, increased duration of hospital stay, few intraoperative complications such as dense adhesions, bile leak, increased duration of hospital stay and significantly greater POD1 VAS score observed more profoundly in male patients. Hence when its a male cholecystectomy surgeons need to be extra careful and have a better mental plan as to anticipated difficulty in laparoscopic cholecystectomy can be tackled efficiently. However, research with large sample size and at national level are required in future to gain better insights into this issue.

**Conflict of Interest:** None

**Funding Support:** Nil

## REFERENCES

1. Coelho JCU, Dalledone GO, Schiel W, Berardin JP, Claus CMP, Marias JEF, Freitas ACT. Does male gender increase the risk of laparoscopic cholecystectomy? ABCD Arq Bras Cir Dig. 2019;32(2): e1438. DOI: /10.1590/0102-672020190001e1438.
2. Bahadur A, Bisht SD, Rathi Y, Shukla A, Aggarwal A. Is gender a determinant for the outcome of laparoscopic cholecystectomy? Int Surg J 2020; 7:3959
3. Stanton LM, Shaffer EA. Epidemiology of gallbladder disease: cholelithiasis and cancer. Gut Liver. 2012 Apr;6(2):172-87. doi: 10.5009/gnl.2012.6.2.172. Epub 2012 Apr 17. PMID: 22570746; PMCID: PMC3343155.
4. Kanakala, V., Borowski, D. W., Pellen, M. G. C., Dronamraju, S. S., Woodcock, S. A. A., Seymour, K., ... Horgan, L. F. (2011). Risk factors in laparoscopic cholecystectomy: A multivariate analysis. International Journal of Surgery, 9(4),

- 318– 323. doi: 10.1016/j.ijmsu.2011.02.003  
10.1016/j.ijmsu.2011.02.003
5. Thesbjerg SE, Harboe KM, Bardram L, Rosenberg J. Sex differences in laparoscopic cholecystectomy. *Surg Endosc.* 2010 Dec;24(12):3068-72. doi: 10.1007/s00464-010-1091-1. Epub 2010 May 7. PMID: 20449610.
  6. Lein, HH., Huang, CS. Male gender: Risk factor for severe symptomatic cholelithiasis. *World J. Surg.* 26, 598–601 (2002). <https://doi.org/10.1007/s00268-001-0275-1>
  7. Zisman A, Gold-Deutch R, Zisman E, Negri M, Halpern Z, Lin G, Halevy A. Is male gender a risk factor for conversion of laparoscopic into open cholecystectomy? *Surg Endosc.* 1996 Sep;10(9):892-4. doi: 10.1007/BF00188477. PMID: 8703145.
  8. Yol S, Kartal A, Vatansev C, Aksoy F, Toy H. Sex as a factor in conversion from laparoscopic cholecystectomy to open surgery. *JLS.* 2006 Jul-Sep;10(3):359-63. PMID: 17212896; PMCID: PMC3015697.
  9. Bazoua G, Tilston MP. Male gender impact on the outcome of laparoscopic cholecystectomy. *JLS J Soc Laparoendosc Surg.* 2014;18(1):50-4
  10. Al-Mulhim AA. Male gender is not a risk factor for the outcome of laparoscopic cholecystectomy: a single surgeon experience. *Saudi J Gastroenterol Off J Saudi Gastroenterol Assoc.* 2008;14(2):73-9.
  11. Kumar J, Kumar P, Meena K, Siddiqui A. Male gender as an independent risk factor for laparoscopic cholecystectomy: An outcome analysis at a teaching institute. *Saudi J Heal Sci.* 2017;6(2):104-9.