

## STUDY OF CLINICAL PROFILE IN PATIENTS WITH SOLITARY VERSUS MULTIPLE GALL STONE DISEASE

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Received : 07/02/2023  
Received in revised form : 04/03/2023  
Accepted : 18/03/2023

### Keywords:

Gall stones, solitary gall stones,  
multiple solitary gall stones.

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DOI: 10.47009/jamp.2023.5.2.334

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

*Int J Acad Med Pharm*  
2023; 5 (2); 1594-1598



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### Abstract

**Background:** Gall stones are most common biliary disease. It affects 10 to 15 percent of the population in the western countries. Majority of patients are asymptomatic, only 1 to 2 % require cholecystectomy. To study the socio-demographic profile of patients with gall stone disease patient and differences in clinical presentation between single and multiple gallstone disease patients associated intra-operative & postoperative difficulties with each type of the stone. **Materials and Methods:** This Cross-sectional study was conducted in the Department of General surgery, Govt. Medical College & STM hospital, Haldwani, India, on 50 patients with gallstones who had been sonographically diagnosed and admitted to the ward. Clinical information, including their signs, symptoms, and preoperative ultrasound results, was recorded on a predesigned performa.] The gallstones were visible after the gallbladder was excised. On the basis of the number of stones (single or multiple) found in each gallbladder, all patients were stratified into two groups. Group “1” was labeled as single stone and group “2” multiple stone. Final assessment was done with respect to all the factors (socio-demographic profile, history, clinical examination, intraoperative findings, postoperative symptoms, duration of hospital stay) and clinical comparison was done between multiple and single gallstone disease patients. **Result:** In this study based upon comparison of clinical profile in gallstone disease in 50 patients with multiple and single gall stones. It was found that incidence of gall stones was more in females i.e., 82% compared to males i.e., 18%. Gall stones were more common in patients belonging to age group 30 to 40 years constituting 32% of the total bulk (mean age + SD 42.58 ± 12.0) as compared to other extremities of age i.e., 18 % of population from the 51 to 75 years of age. Gallstones were more prevalent in middle class family constituting 66% of all cases. Fever was found to be most distressing clinical feature. group 2 patient had difficult intraoperative management due to unorthodox gall bladder features like empyema, pyoceles, gallbladder adhesions constituting 38.4% whereas, 6.1% had gangrenous gallbladder. Difficult intraoperative management and the duration of surgery i.e., >45mins was found to be more in group 2 in both the sexes. it was also found that 24.2% patients of group 2 had longer duration of the hospital stay i.e., upto 5-6 days as compared to single gall stone disease. **Conclusion:** Multiple gall stones have more dire clinical profile in terms of preoperative fever, pain abdomen, and abdominal tenderness, which leads to a difficult intraoperative complication that includes gallbladder adhesions, gallbladder perforation, empyema, or a pyocoele gallbladder, resulting in a longer duration of surgery and, in the postoperative period, pain that makes patients less ambulatory, resulting in a longer duration of hospital stay.

## INTRODUCTION

Gall stones is the most common biliary disease. It is estimated that gallstones affect 10-15 % of the population in the western countries. Gallstones is a significant global health issue.<sup>[1]</sup> Majority of cases (>80%) are asymptomatic and only 1-2 % of these require surgery making cholecystectomy one of the most common operations performed by the surgeons. Despite the high prevalence of cholelithiasis, most patients remain asymptomatic throughout life. For unknown reasons, some patients progress to a symptomatic stage, with typical symptoms of postprandial right upper quadrant pain caused by a stone obstructing the cystic duct. In addition to pain, gallstones may progress to cause complications such as acute cholecystitis, choledocholithiasis, cholangitis, gallstone pancreatitis, gallstone ileus. Rarely, one of these complications of gallstones may be the initial presenting picture. Gallstones in patients without biliary symptoms are commonly diagnosed incidentally during unrelated abdominal imaging or at the time of surgery for an unrelated diagnosis. Several studies have examined the likelihood of developing biliary colic or developing significant complications of gallstone disease after incidental diagnosis in the asymptomatic people. About 80% of these patients will remain symptom free. However, 2% to 3% will become symptomatic per year. Complicated gallstone disease develops in 3% to 5% of symptomatic patients per year. However, some of the patients develop complications without any previous biliary symptoms, thus prophylactic cholecystectomy in asymptomatic patients with gallstones is rarely indicated.<sup>[2]</sup> Single gallbladder stones are more likely to increase the risk of mucocele, empyema, gallbladder perforation, and postoperative complications than multiple stones, according to Mofti AB et al,<sup>[3]</sup> Jalali SA et al also reported that prognosis of solitary stones is worse than multiple gallstones.<sup>[4]</sup>

## MATERIALS AND METHODS

This cross-sectional study was performed from the period of January 2020 to September 2021 in Dr. Susheela Tiwari Government Hospital, Haldwani, Nanital, Uttarakhand, India. 50 sonographically diagnosed patients of gallstones patients undergoing surgery under both elective and emergency settings

for gall stone disease meeting inclusion criteria and exclusion criteria were recruited for statistical purpose for convenience of sampling method after taking their informed consent. The gallstones were visible after the gallbladder was excised. On the basis of the number of stones (single or multiple) found in each gallbladder, all patients were stratified into two groups. Group “1” was labeled as single stone and group “2” multiple stone.

Socio-demographic profile was made of each group including age, sex, socioeconomic status. Preoperative history of clinical symptoms like fever, pain abdomen, dyspepsia, nausea vomiting & signs of abdominal tenderness, murphy’s sign were noted in each group. Investigations like raised TLC, deranged liver function tests, were also recorded in both of the groups. Pre-operative assessment of risk factors for difficult laparoscopic cholecystectomy was done in both of the groups. During intra-operative period, gallbladder pathology (distension, adhesions, empyema, pyocoele, gallbladder perforation), difficult calot’s triangle dissection & conversion from laparoscopic to open cholecystectomy, along with duration of surgery (>45min) was also recorded. Post-op investigation was sent on day 1 and symptoms of pain, fever & vomiting were recorded. Pain in pre and postoperative period were recorded on the basis of pain scale (mild, moderate, severe). Length of hospital stay from the date of admission, along with postop factors that affected the duration of stay was noted. Final assessment was done with respect to all the factors (socio-demographic profile, history, clinical examination, intraoperative findings, postoperative symptoms, duration of hospital stay) and clinical comparison was done between multiple and single gallstone disease patients.

## RESULTS

Based upon comparison of clinical profile in gallstone disease in 50 patients with multiple and single gall stones. We found that incidence of gall stones was more in female group i.e., 82% of population in the study design was females as compared to male group i.e., 18%, Gall stones were more common in the age group of 30-40 year constituting 32% of the total bulk (mean age  $\pm$  SD 42.58  $\pm$  12.0) as compared to other extremities of age i.e., 18 % of population from the 51-75 years of age group as depicted in [Table 1].

**Table 1: Gall stone disease according to age group**

Age Group(years)	Incidence
20-30	20%
31-40	30%
41-50	32%
51-60	12%
61-75	6%

As shown in [Table 2] Gallstones were more prevalent in middle class family constituting 66% of all cases.

**Table 2: Incidence of gallstones according to socio-economic status**

Socio-economic status	Low	Middle	Upper
Percentage	18% (9)	66% (33)	16% (8)

As shown in [Table 3], fever was found to be most distressing clinical feature in patients with multiple gall stone disease comprising of 57.6% in females & 42.4% in males. Other symptoms like pain was also more prevalent in group 2 especially in male subjects constituting 93.95% group 1 male population 76.5%. Nausea (72.7% & 27.3%) and dyspepsia (33.3% & 66.7%) in female and male respectively was also noted more in group 2 patients as compared to group 1. However, Vomiting was noted more in group 1.

**Table 3: Clinical Signs and Symptoms**

Clinical Signs & Symptoms	Female		Male	
	Multiple	Single	Multiple	Single
Pain	61 %	23.5 %	93.9 %	76.5 %
Dyspepsia	33.3 %	47.1 %	66.7 %	52.9 %
Vomiting	30.3 %	52.9 %	67.9 %	47.1 %
Nausea	72.7 %	64.7 %	27.3 %	35.3 %
Fever	57.6 %	94.1 %	42.4 %	5.9 %
Abdomen Tenderness	54.5 %	70.6 %	45.5 %	29.4 %

As illustrated in [Table 4], group 2 patient had difficult intraoperative management due to unorthodox gall bladder features like empyema, pyoceles, gallbladder adhesions constituting 38.4% whereas, 6.1% had gangrenous gallbladder.

**Table 4: Intra-Operative Features of Gall Bladder**

Type of gallstone	Gallbladder anatomy		
	Normal	Unorthodox	Gangrenous
Multiple	57.6% (19)	38.4% (12)	6.1% (2)
Single	82.4% (14)	17.6% (3)	-

Difficult intraoperative management and the duration of surgery i.e., >45mins was found to be more in group 2 in both the sexes comprising 72.7% and 27.3% as compared to group1 constituting only 70.6% and 29.4% in both the sexes.

**Table 5: Duration of Intraoperative Period >45min in Gallstone Disease Patients**

	Female	Male
Multiple stones	72.7%	27.3%
Single stones	70.6%	29.4%

As represented in [Table 6], it was also found that 24.2% patients of group 2 had longer duration of the hospital stay i.e., upto 5-6 days as compared to single gall stone disease group similar duration of stay was found in 11.8% only.

**Table 6: Duration of hospital stay in postoperative period**

	Day 2	Day 3	Day 4	Day 5-6
Multiple	0 %	27%	30%	24.2%
Single	5.9%	64.7%	17.6%	11.8%

## DISCUSSION

In our study Gall stones were more prevalent in third to fourth decade, accounting for 32% of all cases (mean age + SD 42.58 12.0), with a female propensity, comparable to Amjad et al,<sup>[5]</sup> age varied from 30 to 60 years, mean age was 45.56.48,5. This is comparable to research done by Anam Ghaffar et al,<sup>[6]</sup> who showed that the mean age of the patients ranged from 21 to 70 years. With 72% of the patients being female, the male to female ratio was 1:2.5. The majority of patients (32%) were between the ages of 41 and 50. 6. Misrani JK et al,<sup>[7]</sup> found that the average age of group "A" (single stone) was 306.4 years and that of group "B" (many stones) was 47.8 years. 5 (25%) of those in group "A" were male, whereas 15 (75%) were female. resulting in a male to female ratio of 1:5. Group "B" consisted of

15 (19%) males and 65 (81% females), with a male to female ratio of 1:4.3 with more than 80% of patients had numerous stones. S.A. Jalali et al,<sup>[8]</sup> found that 20% of patients had solitary stones. Women had a sevenfold greater overall incidence of cholelithiasis (106 women and 16 men) In the research of Muhammad Salman Shafique, Raheel Ahmad, and colleagues, 244 (48.13%) of 507 patients were under the age of 30. At a mean age of 26.22.98 years, there were 208 girls (85.2%) and 36 men (14.8%). Raja Kumar et al discovered that gall stones are more prevalent in females than men (3 times) and that the most common age group was 40-50 years, with 33.33% in Group I and 31.70% in Group II<sup>10</sup>. Similar findings were found in Mofti et al,<sup>[3]</sup> investigation, the median age for Group I patients was 39 years, and 38 years for Group II patients, with a range of 13 to 91 and 21 to 82 years,

respectively. Middle class people are affected more in our study as compared to high socioeconomic class which is in line with the study done by Shafique et al,<sup>[9]</sup> that gallstones were seen to be more prevalent in patients of middle (64.8%) & upper (19.7%) socioeconomic class (p value 0.019). Fever being the most common and the most distressing clinical symptom in multiple gall stone disease patients in our study i.e. 33 patients out of 50 (57.6%) with multiple gall stone disease with p value of 0.008. Also, pain was more in multiple gallstone disease patients (group 2) especially in male subjects contrary to single gall stone disease mentioned in the study of S.A. Jalali et al,<sup>[8]</sup> and also in study of Muhammad Salman Shafique, Raheel Ahmad et al,<sup>[9]</sup> most common presenting complaint was pain and tenderness at right hypochondrium.

In our study multiple gallstones had difficult intraoperative management due to unorthodox gall bladder features like gallbladder adhesions and difficult calot's triangle anatomy along with few population had gangrenous gallbladder, thus having a longer duration of intraoperative period as compared to group 1, similar results were found by Raja CDK et al<sup>[10]</sup>, inability to safely display and identify anatomical structures of Calot's triangle correctly secondary to severe inflammation or dense adhesions in group 2 as compared to single gall stone patients having relatively normal gallbladder anatomy but contrary results were found by Mofti et al,<sup>[3]</sup> that showed the frequency of mucocele, empyema, gallbladder perforation, intra & postoperative complications were high in single gall stones group 1 than multiple gallstones group 2 & need for emergency surgical intervention and technically difficult surgeries were more encountered with the single gall stone disease patients. Difficult intraoperative management in multiple gall stones group 2 patients along with conversion from laparoscopic to open cholecystectomy, also increases duration of the hospital stay in group 2 patients which is in line to the results obtained by study of Raja CDK et al<sup>[10]</sup> i.e., that the total hospital stay was  $37.7 \pm 14.4$  days for the group 2 and  $12.7 \pm 2.0$  days for the group 1, showing a highly significant difference ( $p < 0.001$ ). Factors affecting length of hospital stay included operation time ( $p < 0.001$ ), emergency operation ( $p < 0.001$ ), age ( $p = 0.014$ ), and history of smoking ( $p = 0.022$ ) were also identified as independent factors influencing length of postoperative hospital stay as mentioned in the study of Chong Jae, Jin Ho Lee et al.<sup>[11]</sup>

The Positive Predictive factors in our study were preoperative fever ( $p = 0.008$ ), pain & the abdominal tenderness and intraoperative gallbladder altered anatomy & in postoperative period pain ( $p$  value 0.008) leading to increased duration of hospital stay with high risk of getting hospital acquired infection were more in multiple gallstones as compared to single gallstones.

## Limitations of Study

Study population was small, and the study was only confined to kumau region of Uttarakhand India, thus having similar diet and environmental factors too. Also, operative duration was dependent on the skill of operating surgeon.

## Acknowledgement

The authors recognize the enormous assistance provided by the academics whose works are mentioned and included in this manuscript's references. The authors would also want to express their gratitude to the writers, editors, and publishers of all the books, journals, and articles that served as the foundation for this paper.

## CONCLUSION

All subjects were interviewed face-to-face, revealing detailed information about their age, sex, address, occupation, religion, socioeconomic status, education, associated risk factors and clinical presentation and management. Multiple gall stones disease patients had direr clinical profile with respect to preoperative fever, pain abdomen and abdominal tenderness, which leads to a difficult intraoperative complication that include gallbladder adhesions, gallbladder perforation, empyema or a pyoceles gallbladder that eventually have more longer duration of surgery and in postoperative period, pain makes patients less ambulatory and thus, prolonging duration of hospital stay. Thus, gallstones whether single or multiple diagnosed during USG or incidentally as asymptomatic (more preferably multiple gallstones), these patients must be counselled and motivated to get operated as earliest to avoid any severe complications during intraoperative period and conversion of laparoscopic cholecystectomy to an open cholecystectomy and ultimately affecting the duration of hospital stay.

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