

## Original Research Article

# Surgical diseases and surgical outcomes in geriatric patients

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## ABSTRACT

**Background:** To study the demography, disease distribution and co morbid conditions, complications and mortality among elderly patients undergoing operation in general surgical wards.

**Methods:** A prospective observational study was conducted among elderly patients of age  $\geq 60$  years admitted in General Surgery wards at our institute for a period of a year.

**Results:** A total of 137 patients were recruited in this study. Out of them 62.04% were men and 37.96% were women. Most common system involved was hepatobiliary with a total of 38 cases (27.7%), most common surgical disease in our study was hernias (27%) and gallstone disease (25%). About 55.5% of our study population had co morbid medical conditions. Hypertension was the most common co morbidity (38%) in our study. Out of 137 cases, 115 cases were elective cases and 22 were emergency cases, operated in emergency settings. About 16.7% of the study population had surgical complications. Post-operative seroma formation at the surgical site was the most common complication. About 7 cases were succumbed to death and mortality rate was about 5.1% in our study population.

**Conclusion:** Prevalence of medical co morbidities is higher in elderly population. Out of them, hypertension and diabetes mellitus are the most common co morbid conditions. Most common indications for elective surgery in our study are hernias and gallstone disease. Early elective surgical intervention is preferred in elderly population when presented, as age, co morbidities and emergency settings increase risk of perioperative mortality.

**Keywords:** Geriatric patients, Surgical diseases, Geriatric surgery, Co morbidities, Surgical outcomes

## INTRODUCTION

The proportion of the older population in a country is increasing day by day. Due to economic well-being, better health care system, good and various medicines and substantial reduction in mortality in the society, there are an increased number of older people. This phenomenon, called population ageing, is a dynamic demographic trend all over the world.

Due to better medical quality and living conditions, more and more elderly patients are encouraged to undergo surgeries which were previously considered too risky.<sup>1,2</sup> However, geriatric patients commonly pose a

significant challenge both in emergency surgery and in elective surgery.<sup>3</sup> Although old age alone may not necessarily be a risk factor.<sup>4,5</sup> Emergency surgery, medical problems and reduced physiological reserve in the elderly often put them in an increased risk category.<sup>6-8</sup> Due to limited physiological reserves, older patients may not tolerate the operative procedure & can also develop more complications when compared to younger patients.<sup>9,10</sup>

We took a small leap and conducted this study to understand the demography and disease distribution among older patients  $\geq 60$  years of age that who have been admitted for operative procedures in general surgical wards of our institute.

## METHODS

A prospective observational study was conducted in the Department of Surgical Disciplines of our institute over a period of one year from January 2018 to December 2018. Elderly patients  $\geq 60$  years of age admitted in General surgical wards for operative intervention were included after taking proper written consent. Convenience sampling method was followed in this analytical cohort. Patients of super specialities like neurosurgery, cardiovascular surgery, urology, orthopedics and those who refused for follow-up and enrolment of study were excluded. Enrolled population is grouped into group I and II based on age. Population aged 60 years to 75 years grouped in group I and  $>75$  years in group II. Detailed history, co morbidities and examination performed. Diagnosis made and divided into following systems; hepatobiliary, gastrointestinal, breast and endocrine, respiratory, vascular, hernias and others. Preoperative American society of anaesthesiologists physical status score was given and post-operative events noted.

During discharge, patients were graded according to Clavien-Dindo grading system for postoperative complication and were followed at 1 week, 2 weeks, 6 weeks and 3 months after discharge to look for any general surgical complications like seroma, hematoma, surgical site infection, wound dehiscence and fever. Patients with any of these complications were managed accordingly when identified.

After obtaining clearance from the ethical committee, a study conducted with study population of 137 patients and data analysed using SPSS software.

## Limitations

A small cohort study and patients who had admitted in general surgical wards only were enrolled, patients admitted in specialities like neurosurgery, cardiovascular surgery, urology and ortho were not enrolled.

## RESULTS

A total of 137 patients were studied. In our study, 119 patients were under group I and 18 in group II. Out of 137 patients, 62.04% were men and 37.96% were women. Percentage of gender distribution in different groups is depicted in the following (Table 1).

**Table 1: Gender-wise distribution in group I and II.**

Age group	Sex		Total
	Men	Women	
	N (%)	N (%)	N (%)
<b>I</b>	71 (59.66)	48 (40.33)	119 (100)
<b>II</b>	14 (77.77)	4 (22.22)	18 (100)
<b>Total</b>	85 (62.04)	52 (37.95)	137 (100)

Majority of patients were from the places nearby to the institute. Most common surgical diagnosis in our study population was Hernias with 37 cases (27%) followed by gallstone disease (GSD/cholelithiasis) with 25.5%. About 27 cases were diagnosed with malignancy accounting to 19.7%. Diagnoses related to trauma were seen in 17 cases i.e. 12.4% of the population. Rest of the diagnoses were shown group-wise in the (Table 2).

**Table 2: Diagnosis including in group I and II.**

Diagnosis										Total
Age Group	Achalasia cardia	Malignancy	Gall-stone	Hernia	Multi-nodular goitre	Others	Perforation peritonitis	Rectal pro-lapse	Trauma	
I	2	26	31	29	2	9	1	2	17	119
II	0	1	4	8	1	3	1	0	0	18

**Table 3: System-wise disease distribution in groups.**

System	Age Group		Total (N)
	I (n)	II (n)	
<b>Breast and endocrine</b>	16	3	19
<b>Gastrointestinal</b>	22	2	24
<b>Hepatobiliary</b>	33	5	38
<b>Hernias</b>	29	8	37
<b>Others</b>	15	0	15
<b>Respiratory</b>	3	0	3
<b>Vascular</b>	1	0	1
<b>Total</b>	119	18	137

**Table 4: complications in our study population.**

Complications	1 week	2 weeks	6 weeks	3 months	Total
<b>Seroma</b>	13 cases	3 cases	No case	No case	13 cases
<b>Surgical site infection</b>	8 cases	2 cases	No case	No case	8 cases
<b>Wound dehiscence</b>	1 case	no case	No case	No case	1 case
<b>Fever</b>	1 case	no case	No case	No case	1 case
<b>Pain</b>	3 cases	2 cases	No case	No case	5 cases
<b>Hypocalcemia</b>	1 case	no case	No case	No case	1 case

Peripheral arterial disease, caecal dysplasia, gallbladder polyp, choledocholithiasis, fibroadenomas, morbid obesity, stoma reversal, appendicular mass was categorised as others. Road traffic accidents, railway track injury, blunt and penetrating injuries were grouped under trauma in Table 2.

After System-wise categorizing the diagnosis, the most common systems involved were hepatobiliary with 38 cases (27.7%) followed by Hernias 37 cases (27%) and the rest systematic distribution is as depicted in (Table 3). Systems like musculoskeletal, genitourinary, soft tissue were grouped as others in Table 3. Almost 110 cases (80.3%) of our study population were presented with benign conditions whereas 27 cases (19.7%) were malignant cases.

About 76 cases (55.5%) of patients had medical co morbidities. Thirty eight percent of the study population had hyper-tension and 14% had diabetes mellitus.

Out of 137 cases, 119 cases had elective surgery and rest 18 had emergency surgery. About 48% of the study patients were ASA II and 11.6% were ASA V. According to Clavien-Dindo grading system for postoperative complications, 113 patients (82%) were Grade I & II and 7 patients (5.1%) were grade V.

Surgical complications were seen in 16.7% of study patients. Post-operative complications like seroma formation in 13 cases, surgical site infections in 8 cases of study patients were observed. These were managed conservatively. Wound dehiscence was seen in one patient with sheath intact in emergency abdominal surgery. Postoperative fever was observed in one patient which resolved subsequently and hypocalcaemia was identified in patient post thyroidectomy and was managed by oral medicines. By Third week complications were resolved. List of complications is mentioned in (Table 4).

Nearly 7 cases were succumbed to death and mortality rate was 5.1% in our study. All those were ASA V patients, operated in an emergency setting. About 5 cases were post trauma like road traffic accident, railway track injuries, penetrating injuries etc., one was a case of perforation peritonitis and other was a case of acute intestinal obstruction following metastatic gallbladder carcinoma.

A total of 17 trauma patients were enrolled and mortality rate in trauma patients was 29.42% in our study. Mean Hospital stay in our study was  $8.8 \pm 8.9$  days.

## DISCUSSION

Due to betterment and growth in the medical field, elderly population is in increasing trend. An increase in life expectancy has been observed in developed and developing nations, including India, due to betterment in the diagnoses and treatments of many cardiovascular and pulmonary diseases, as well as non-communicable diseases, such as hypertension, diabetes etc.

Due to depleted physiologic reserves and senescence, elderly population is at greater risk to surgical approach even though there has been progress in modern surgical measures and better perioperative care. Surgery itself remains the major cause of morbidity and mortality in this group of population.<sup>11</sup>

It is because of advances in preoperative care, anaesthesia, surgical techniques and perioperative care, major surgeries can be performed on elderly with acceptable postoperative outcomes.<sup>12</sup> Nevertheless, surgical treatment of elders is often associated with a less favourable outcome. Consequently, there is an increase in the number of geriatric patients requiring surgery.<sup>13</sup>

Our study with 137 patients showed 86.9% of the study population belonged to group I (60 to 75 years) and 13.1% belonged to group II (>75 years). With this we can infer that the maximum number of patients being admitted were below 75 years of age. As age increases, dependency and risk of co morbidities increase which overall leads to backstep to undergo major surgery at this age.

In our study population 62% were men. A study showed 56% of men in that study population.<sup>14</sup> Similarly, another retrospective study found 52.5% of men and 47.5% of women.<sup>15</sup> A study in elderly patients above 65 years of age, found 52.2% were men and rest 47.8% were women.<sup>16</sup> With the above data, we can infer that disease patterns are not equally distributed among gender in elderly population and men are more commonly admitted and operated in elderly population. One possibility being, ease of accessibility to medical services and independent nature of male gender. In our scenario, women are more

dependent on others to accompany for services to be rendered.

Coming to system-wise disease prevalence in elderly population, hepatobiliary system is the most commonly involved followed by hernias in our study. Similarly, a study found that 26% of diseases belonged to the biliary system, 20% were hernias, 40% were gastrointestinal systems in that study with 92 patients. In another study, gastrointestinal system (30%) involvement was more commonly involved than Hernia repair surgeries (22%) and biliary tract procedures (13%).<sup>17</sup>

According to specific diagnosis, the most common diagnosis in our study was hernias and cholelithiasis followed by carcinomas.

In the group I population, cholelithiasis was the most common diagnosis followed by hernias. Among group II, hernias were the most commonly diagnosed followed by cholelithiasis and carcinoma.

As age increases, incidence of cholelithiasis increases. Studies showed that the incidence of cholelithiasis was about 5% for women <40 years of age, the incidence rises to 30% for women >80 years of age.<sup>18</sup> It is known that performing surgery in elective settings would be of critical importance in geriatric patients for asymptomatic gallstones. Because as age increases, motility of gallbladder decreases as do cholesterol metabolism which results in gall stones formation. Even presentation in older patients is often late and is associated with increased complication risks at the time of presentation.

Elderly patients with hernias when not offered elective surgery, in view of comorbid condition or older age, morbidity and mortality rates increase when they undergo emergency surgery.<sup>19</sup> Elderly cancer patients have always existed. As life expectancy is increased, now there are more of them than before. Therefore, special attention is to be paid to the treatment of older cancer patients. Risk of cancer significantly increases with age. Early-stage cancer has better prognosis if treated surgically. Surgery may improve the patient's quality of life, even if the aim is not to extend one's life span.<sup>20</sup> Common cancers in general surgical wards in elderly groups are colorectal cancers. Next common cancer being breast cancers. Both of the common cancers have better prognosis if surgically treated during early stages of disease.<sup>20</sup>

When it comes to elderly population, co morbidities are most common among them at this stage of life. It is known that cardiac, renal and pulmonary reserves begin to get depleted as age increases. Although ample time is available before elective surgery to evaluate and correct co morbid conditions, this is not the case in emergency surgery. Therefore, complications and mortality rates following emergency surgery are higher in the geriatric patients when compared with elective surgery.<sup>21</sup> Most common co morbidity would be the cardiovascular

system. Age dominates risk factors for cardiovascular disease.<sup>22,23</sup> Hypertension is the single most common co morbidity associated in elderly age. In our study, 55.5% of the study population had one or the other co morbidity associated at the time of presentation.

Hypertension was the most common co morbidity associated with our study population. The next most common co morbidity was type II diabetes mellitus. Majority of the patients in a study had hypertension (47.5%) followed by diabetes (21%) and CAD (18.8%). Similarly, another study showed that Hypertension and dyspnoea as the most frequent risk factor in 80 years and older patients and hypertension is the single most common comorbidity.<sup>24,25</sup> Same as the above, hypertension was most common co morbidity in our study followed by diabetes.

American society of Anaesthesiologists had developed a physical status classification wherein patients were grouped on the basis of their health status. Although this classification used to describe preoperative physical status has never been intended to indicate anaesthetic risk. In our study, 48.17% of patients were ASA grade II and 11.6% were graded as ASA grade V.

We had a complication rate of 16.7% and the mortality rate of 5.1% which were comparable with many other studies. Only emergency surgical procedures had mortality. Most of them were admitted following major Trauma. There was no elective surgical mortality in our study.

A prospective study with 220 patients wherein in hospital with 35% of complication rate. Similarly, another study had a complication rate of 12.5% and other similar studies showed complication rate of 16.7% and mortality rate of 4.6% was documented.<sup>25</sup> Mortality rate of 5.8% was reported in a Scandinavian study.<sup>26</sup> There was an overall mortality rate of 4.7%, a complication rate of 27.0% in another study in an elderly population of about 3832 patients.<sup>27</sup>

The incidence of wound complications in the elderly people in a prospective study was 16.3%.<sup>28</sup> In our study wound infection rate was 7.29% which was comparable. There are very few studies to compare wound infection post-surgery in geriatric population.

Study conducted in 92 geriatric patients presented 7.9  $\pm$ SD7. Thirteen days as mean hospital stay. Similarly, another retrospective study showed overall mean hospital stay was 8.2  $\pm$ SD 8.0 days (median 7 days) which is almost similar to our study with mean of 8.8  $\pm$ SD 8.9 days.<sup>29</sup>

## CONCLUSION

With increasing age, the risk of co morbidities increases. Early surgical intervention in elderly patients is preferred



and must be advisable after optimisation of co morbid conditions for good surgical outcomes. Hernias and gallstone disease are the most common elective surgical diseases found in elderly patients. Surgically treatable causes should be corrected early, preferably electively, to avoid intervention in emergency setting, which would increase morbidity and mortality

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