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Original Research Article

A Prospective Observational Analysis of Geriatric Patients to Determine the Incidence of Surgical Disorders and Surgical Outcomes

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Abstract

Aim: The aim of this study to evaluate the surgical diseases and surgical outcomes in geriatric patients. **Methods:** This prospective observational study which was carried in the Department of General Surgery, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India. for 12 months. A total of 120 patients were included who fulfilled study obligations. Elderly patients ≥60 years of age admitted in General surgical wards for operative intervention were included in this study. Enrolled population is grouped into group I and II based on age. Population aged 60 years to 74 years grouped in group I and >74 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. **Results:** A total of 120 patients were studied. In our study, 100 patients were under group I and 20 in group II. Out of 137 patients, 62.04% were men and 37.96% were women. Most common surgical diagnosis in our study population was gallstone disease (GSD/cholelithiasis) with 36% followed by Hernias with 31 cases (31%). About 23 cases were diagnosed with malignancy accounting to 23%. Diagnoses related to trauma were seen in 13 cases i.e. 13% of the population. The most common systems involved were hepatobiliary with 35 cases (35%) followed by Hernias 31cases (31%). Almost 100 cases (83.33%) of our study population were presented with benign conditions whereas 20 cases (16.67%) were malignant cases. About 69 cases (57.5%) of patients had medical co morbidities. 37.5 percent of the study population had hyper-tension and 12.5% had diabetes mellitus. Out of 120 cases, 105 cases had elective surgery and rest 15 had emergency surgery. About 50% of the study patients were ASA II and 12.5% where ASA V. Surgical complications were seen in 19.17% of study patients. Post-operative complications like seroma formation in 10 cases, surgical site infections in 6 cases of study patients were observed. These were managed conservatively. Nearly 5 cases were succumbed to death and mortality rate was 4.17% in our study. Mean Hospital stay in our study was 9.1±9.2 days. **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.

Keywords: Geriatric Patients, Surgical Diseases, Geriatric Surgery, Comorbidities, Surgical Outcomes

Introduction

Over the last decade, the number of elderly individuals in the United States has dramatically risen. Nearly 13% of the United States population is aged 65 years or older, and this group is expected to comprise over 20% of Americans by 2030[1]. In 2007, over one-third of all inpatient surgical procedures were performed on this population, a number which is projected to double by 2020[2,3]. This rising demand for surgical interventions necessitates accurate preoperative risk stratification techniques that are applicable to elderly individuals. While commonly used preoperative risk assessments incorporate patient laboratory values, presence of comorbidities, and functional status to predict postoperative outcomes, most of these measures often do not account for elderly-specific syndromes that may pose a hazard for geriatric patients if not addressed. Prediction of surgical complications and postoperative morbidity and mortality is vital to the informed consent process and can help the surgeon guide patient expectations after surgery, particularly with regards to quality of life and ability to convalesce to their preoperative baseline level of functioning. The most widely used scale has been the American Society of Anaesthesiology (ASA) score, initially developed to classify a patient's physical status based on subjective degree of systemic disease prior to surgery rather than "operative risk"[4,5]. ASA score is used most commonly to give surgeons and anesthesiologists an estimate of risk of postoperative complications. However, it has been criticized for its lack of accuracy and its inconsistencies between evaluators[6]. Scoring systems such as the Preoperative Score to Predict Postoperative Mortality (POSPOM) incorporate objective markers such as dementia, diabetes, dialysis dependence, and heart failure to determine perioperative and postoperative risk of mortality, but do not include the individual's postoperative quality of life and morbidity[6]. Additionally, the Charlson Comorbidity Index is another commonly used scale that uses pre-existing chronic disease to determine a patient's 1-year mortality risk and can help providers in deciding how aggressively to treat a condition in the preoperative period[7]. Overall, these assessments, among several others, shed insight on determining and improving upon physical, functional, and social issues in patients with the goal of optimizing outcomes. Unfortunately, preoperative assessments have not been adapted to identify geriatric-specific conditions and provide an opportunity for intervention in order to reduce risk. Comprehensive preoperative evaluation with execution of patient-focused treatment strategies is thought to reduce morbidity and mortality in otherwise potentially risky patients[8]. However, these assessment modalities can be particularly subjective and may demonstrate poor reliability between evaluators, ultimately resulting in variability of results[9].

Material and methods

This prospective observational study which was carried in the Department of General Surgery, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India. For 12 months, after taking the approval of the protocol review committee and institutional ethics committee. A total of 120 patients were included who fulfilled study obligations. Elderly patients ≥60 years of age admitted in General surgical wards for operative intervention were included after taking proper written consent. Patients of super

specialities like neurosurgery, cardiovascular surgery, urology, orthopedics and those who refused for follow-up and enrolment of study were excluded.

Methodology

Enrolled population is grouped into group I and II based on age. Population aged 60 years to 74 years grouped in group I and >74 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.

Results

A total of 120 patients were studied. In our study, 100 patients were under group I and 20 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, N (%)
	Men, N (%)	Women, N (%)	
I	60 (60)	40 (40)	100 (100)
II	16 (80)	4 (20)	20 (100)
Total	76 (63.33)	44 (36.67)	120 (100)

Majority of patients were from the places nearby to the institute. Most common surgical diagnosis in our study population was gallstone disease (GSD/cholelithiasis) with 36% followed by Hernias with 31 cases (31%). About 23 cases were diagnosed with malignancy accounting to 23%. Diagnoses related to trauma were seen in 13 cases i.e., 13% 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	Multinodular goitre	Others	Perforation peritonitis	Rectal prolapse	Trauma	
I	2	22	30	23	1	7	1	1	13	100
II	0	1	6	8	2	2	1	0	0	20

Table 3: System-wise disease distribution in groups

System	Age Group		Total (N)
	I (n)	II (n)	
Breast and endocrine	13	4	17
Gastrointestinal	19	2	21
Hepatobiliary	30	5	35
Hernias	22	9	31
Others	13	0	13
Respiratory	2	0	2
Vascular	1	0	1
Total	100	20	120

Table 4: complications in our study population.

Complications	1 week	2 weeks	6 weeks	3 months	Total
Seroma	10 cases	2 cases	No case	No case	10 cases
Surgical site infection	6 cases	1 case	No case	No case	6 cases
Wound dehiscence	1 case	No case	No case	No case	1 case
Fever	1 case	No case	No case	No case	1 case
Pain	4 cases	1 case	No case	No case	4 cases
Hypocalcemia	1 case	No case	No case	No case	1 case

Peripheral arterial disease, caecal dysplasia, gallbladder polyp, Choledocholithiasis, fibroadenoma, 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 35 cases (35%) followed by Hernias 31cases (31%) 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 100 cases (83.33%) of our study population were presented with benign conditions whereas 20 cases (16.67%) were malignant cases.

About 69 cases (57.5%) of patients had medical co morbidities. 37.5 percent of the study population had hyper-tension and 12.5% had diabetes mellitus.

Out of 120 cases, 105 cases had elective surgery and rest 15 had emergency surgery. About 50% of the study patients were ASA II and 12.5% were ASA V. According to Clavien-Dindo grading system for postoperative complications, 106 patients (88.33%) were Grade I & II and 14 patients (11.67%) were grade V.

Surgical complications were seen in 19.17% of study patients. Post-operative complications like seroma formation in 10 cases, surgical site infections in 6 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 1 patient who 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 5 cases were succumbed to death and mortality rate was 4.17% in our study. All those were ASA V patients, operated in an emergency setting. About 3 cases were post trauma like road traffic accident, railway track injuries, penetrating injuries etc., 1 was a case of perforation peritonitis

and other was a case of acute intestinal obstruction following metastatic gallbladder carcinoma. A total of 13 trauma patients were enrolled and mortality rate in trauma patients was 23.08% in our study. Mean Hospital stay in our study was 9.1±9.2 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[10].

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[11]. 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[12].

A total of 120 patients were studied. In our study, 100 patients were under group I and 20 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. 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 63.33% were men. A study showed 56% of men in that study population.[13] Similarly, another retrospective study found 52.5% of men and 47.5% of women[14]. A study in elderly patients above 65 years of age, found 52.2% were men and rest 47.8% were women[15]. 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.

Most common surgical diagnosis in our study population was gallstone disease (GSD/cholelithiasis) with 36% followed by Hernias with 31 cases (31%). About 23 cases were diagnosed with malignancy accounting to 23%. 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%)[16].

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[17]. 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[18]. 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[20]. 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[19].

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[20]. Most common co morbidity would be the cardiovascular system. Age dominates risk factors for cardiovascular disease[21,22]. Hypertension is the single most common co morbidity associated in elderly age. In our study, about 69 cases (57.5%) of patients had medical co morbidities. 37.5 percent of the study population had hypertension and 12.5% had diabetes mellitus.

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[23,24]. 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, out of 120 cases, 105 cases had elective surgery and rest 15 had emergency surgery. About 50% of the study patients were ASA II and 12.5% were ASA V.

Surgical complications were seen in 19.17% of study patients. Post-operative complications like seroma formation in 10 cases, surgical site infections in 6 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 1 patient which resolved subsequently and hypocalcaemia was identified in patient post thyroidectomy and was managed by oral medicines. By Third week complications were resolved. Nearly 5 cases were succumbed to death and mortality rate was 4.17% in our study

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[25]. Mortality rate of 5.8% was reported in a Scandinavian study[25]. 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[26].

The incidence of wound complications in the elderly people in a prospective study was 16.3%[27]. In our study wound infection rate was 5% which was comparable. There are very few studies to compare wound infection post-surgery in geriatric population.

In our study the mean Hospital stay in our study was 9.1±9.2 days. Similarly, another retrospective study showed overall mean hospital stay was 8.2 ±SD 8.0 days (median 7 days) which is almost similar to our study with mean of 8.8 ±SD 8.9 days[28].

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.

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