

## Clinico-epidemiological Evaluation of Surgical Diseases and Surgical Outcomes in Geriatric Patients

Amrit Kumar

Assistant Professor, Department of General Surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, India

Received: 03-07-2023 Revised: 11-08-2023 / Accepted: 20-09-2023

Corresponding author: Dr. Amrit Kumar

Conflict of interest: Nil

### Abstract

**Aim:** The aim of the present study was to assess 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 in the Department of General Surgery, over a period of one year. A total of 100 patients were studied.

**Results:** In our study, 90 patients were under group I and 10 in group II. Out of 100 patients, 60% were men and 40% were women. Most common surgical diagnosis in our study population was Hernias with 23 cases (23%) followed by gallstone disease (GSD/cholelithiasis) with 27%. About 16 cases were diagnosed with malignancy accounting to 16%. Diagnoses related to trauma were seen in 18 cases i.e. 18% of the population. After System-wise categorizing the diagnosis, the most common systems involved were hepatobiliary with 30 cases (30%) followed by Hernias 32 cases (32%). Post-operative complications like seroma formation in 12 cases, surgical site infections in 5 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.

**Conclusion:** With increasing age, the risk of co morbidities increases. Early surgical intervention in elderly patients is preferred and must be advisable after optimization 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

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

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

### Introduction

With better medical quality and living conditions, the elderly population around the world is growing each year. More and more elderly patients are encouraged to receive operations that have previously been considered too risky. [1,2] However, geriatric patients often pose a significant challenge not only in emergency surgery but also in elective surgery. [3]

The most widely used scale has been the American Society of Anesthesiology (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]

However, there is a relative paucity of scientific literature which examines perioperative health care patterns in the oldest- old patients ( $\geq 75$  years of age) despite their high risk for postoperative complications and mortality. Single and even multi-center studies often have inadequate sample sizes to describe this surgical population in-depth. [8] The magnitude and risk of surgery for the aging

population underscores the importance of identifying high impact areas to study in order to improve perioperative outcomes in the future. Factors impacting increasing morbidity and mortality rates can be divided into patient factors, such as decreased physiological reserve, comorbidity, poly-pharmacy and frailty, and into environmental factors such as the quality of primary evaluation on arrival to the emergency department, the presence of staff trained to assess and deal with frailty and a standardised protocol of shared decision-making that is an essential component of patient-centred care to decrease futility in managing advanced surgical diseases in frail and older patients. In a critical setting, above all during the night, in a short time for decision making, the assessment of frailty, risk factors for negative outcomes and medical complications such as pneumonia, cardiac or renal issues or geriatric syndromes including delirium, should be prioritised and standardised to improve the management of older patients and their quality of life, thereby decreasing morbidity, hospital length of stay (LOS), and in-hospital and 30 days-mortality. [9,10]

The aim of the present study was to assess the demography, disease distribution and co morbid conditions, complications and mortality among elderly patients undergoing operation in general surgical wards.

#### Materials and Methods

A prospective observational study was conducted in the Department of General Surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, India

over a period of one year. A total of 100 patients were studied. 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 100 patients and data analysed using SPSS software.

#### Results

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

Group	Sex		Total
	Men	Women	
	N (%)	N (%)	N (%)
(60-75 years) I	54	36	90
(>75 years) II	6	4	10
<b>Total</b>	60 (60)	40 (40)	100 (100)

In our study, 90 patients were under group I and 10 in group II. Out of 100 patients, 60% were men and 40% were women.

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

Diagnosis										Total
Age Group	Achalasia cardia	Malignancy	Gallstone	Hernia	Multi-nodular goitre	Others	Perforation peritonitis	Rectal pro-lapse	Trauma	
I	2	15	25	20	2	5	1	2	18	90
II	0	1	2	3	1	2	1	0	0	10

Most common surgical diagnosis in our study population was Hernias with 23 cases (23%) followed by gallstone disease (GSD/cholelithiasis) with 27%. About 16 cases were diagnosed with malignancy accounting to 16%. Diagnoses related to trauma were seen in 18 cases i.e. 18% of the population.

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

System	Group		Total (N)
	I (n)	II (n)	
Breast and endocrine	13	2	15
Gastrointestinal	19	1	20
Hepatobiliary	27	2	30
Hernias	27	5	32
Others	12	0	12
Respiratory	2	0	2
Vascular	1	0	1
<b>Total</b>	<b>90</b>	<b>10</b>	<b>100</b>

After System-wise categorizing the diagnosis, the most common systems involved were hepatobiliary with 30 cases (30%) followed by Hernias 32 cases (32%).

**Table 4: Complications in our study population**

Complications	1 week	2 weeks	6 weeks	3 months	Total
Seroma	10	2	-	-	12
Surgical site infection	4	1	-	-	5
Wound dehiscence	1	-	-	-	1
Fever	1	-	-	-	1
Pain	2	1	-	-	3
Hypocalcemia	1	-	-	-	1

Post-operative complications like seroma formation in 12 cases, surgical site infections in 5 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.

### Discussion

With improvements in health and social care in the preceding century, we are now seeing that the over-65-year-old cohort makes up a quarter of the population in the developed world. This change in the structure of society impacts the delivery of health care. As ageing is associated with an increase in the incidence of degenerative, neoplastic and vascular conditions, it is increasingly common for surgical teams to provide elective surgery as definitive treatment for older people. Whilst, there have been many advances in surgical and anaesthetic techniques allowing access to treatment for older people, they continue to have higher rates of perioperative morbidity and mortality in comparison to younger patients and incur higher health and social care costs. Emergency surgery, medical problems and reduced physiological reserve in the elderly often put them in an increased risk category. [11-13] Due to limited physiological reserves, older patients may not tolerate the operative procedure &

can also develop more complications when compared to younger patients. [14,15]

In our study, 90 patients were under group I and 10 in group II. Out of 100 patients, 60% were men and 40% were women. Similarly, another retrospective study found 52.5% of men and 47.5% of women. [16] A study in elderly patients above 65 years of age, found 52.2% were men and rest 47.8% were women. [17] 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. 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. [18] 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. [19] 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. [20]

Most common surgical diagnosis in our study population was Hernias with 23 cases (23%) followed by gallstone disease (GSD/cholelithiasis) with 27%. About 16 cases were diagnosed with malignancy accounting to 16%. Diagnoses related to trauma were seen in 18 cases i.e. 18% of the

population. After System-wise categorizing the diagnosis, the most common systems involved were hepatobiliary with 30 cases (30%) followed by Hernias 32 cases (32%). Post-operative complications like seroma formation in 12 cases, surgical site infections in 5 cases of study patients were observed. These were managed conservatively. 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%). [21]

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. 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. [22] 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. [23] 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. [24] 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]

### 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.

### References

1. Alexander KP, Anstrom KJ, Muhlbaier LH, Grosswald RD, Smith PK, Jones RH, Peterson ED. Outcomes of cardiac surgery in patients age  $\geq$  80 years: results from the National

- Cardiovascular Network. *Journal of the American College of Cardiology*. 2000 Mar 1; 35(3):731-8.
2. Klopfenstein CE, Herrmann FR, Michel JP, Clergue F, Forster A. The influence of an aging surgical population on the anesthesia workload: a ten-year survey. *Anesthesia & Analgesia*. 1998 Jun 1;86(6):1165-70.
3. Dhesi J. Improving outcomes in older people undergoing elective surgery. *The journal of the Royal College of Physicians of Edinburgh*. 2010 Dec 1;40(4):348-53.
4. Owens WD, Felts JA, Spitznagel Jr EL. ASA physical status classifications: a study of consistency of ratings. *Anesthesiology*. 1978 Oct 1;49(4):239-43.
5. Makary MA, Segev DL, Pronovost PJ, Syin D, Bandeen-Roche K, Patel P, Takenaga R, Devgan L, Holzmueller CG, Tian J, Fried LP. Frailty as a predictor of surgical outcomes in older patients. *Journal of the American College of Surgeons*. 2010 Jun 1;210(6):901-8.
6. Le Manach Y, Collins G, Rodseth R, Le Bihan-Benjamin C, Biccard B, Riou B, Devereaux PJ, Landais P. Preoperative score to predict postoperative mortality (POSPOM) derivation and validation. *Anesthesiology*. 2016 Mar 1;124(3):570-9.
7. Kim SW, Han HS, Jung HW, Kim KI, Hwang DW, Kang SB, Kim CH. Multidimensional frailty score for the prediction of postoperative mortality risk. *JAMA surgery*. 2014 Jul 1;149(7):633-40.
8. Li G, Warner M, Lang BH, Huang L, Sun LS. Epidemiology of anesthesia-related mortality in the United States, 1999–2005. In *The Journal of the American Society of Anesthesiologists* 2009 Apr 1 (Vol. 110, No. 4, pp. 759-765). The American Society of Anesthesiologists.
9. Green G, Shaikh I, Fernandes R, Wegstapel H. Emergency laparotomy in octogenarians: a 5-year study of morbidity and mortality. *World journal of gastrointestinal surgery*. 2013 Jul 7;5(7):216.
10. Theou O, Squires E, Mallery K, Lee JS, Fay S, Goldstein J, Armstrong JJ, Rockwood K. What do we know about frailty in the acute care setting? A scoping review. *BMC geriatrics*. 2018 Dec;18:1-20.
11. Mohr DN. Estimation of surgical risk in the elderly: a correlative review. *J Am Geriatr Soc*. 1983;31:99-102.
12. Marshall WH, Fahey PJ. Operative complications and mortality in patients over 80 years of age. *Arch Surg*. 1964;88:896-904.
13. Shipton EA. The peri-operative care of the geriatric patient. *S Afr Med J*. 1983;63:855-60.
14. Simmonds PD, Best L, George S, Baughan C, Buchanan R, Davis C. Surgery for colorectal cancer in elderly patients: a systematic review,

- Colorectal cancer collaborative group. *Lancet*. 2000;356:968-74.
15. Hamel MB, Henderson WG, Khuri SF, Daley J. Surgical outcomes for patients aged 80 and older: morbidity and mortality from major noncardiac surgery. *J Am Geriatr Soc*. 2005; 53:424-9.
  16. Chung JY, Chang WY, Lin TW, Lu JR, Yang MW, Lin CC, Chang CJ, Chou AH. An analysis of surgical outcomes in patients aged 80 years and older. *Acta Anaesthesiologica Taiwanica*. 2014 Dec 1;52(4):153-8.
  17. Özkan E, Fersahoğlu MM, Dulundu E, Özel Y, Yıldız MK, Topaloğlu Ü. Factors affecting mortality and morbidity in emergency abdominal surgery in geriatric patients. *Turkish journal of trauma and emergency surgery*. 2010 Sep 1;16(5):439-44.
  18. Durukan P, Çevik Y, Yıldız M. Evaluation of the elderly patients with abdominal pain in the emergency department. *Turk J Geriatr*. 2005; 8(3):111-4.
  19. Cheema FN, Abraham NS, Berger DH, Albo D, Taffet GE, Naik AD. Novel approaches to perioperative assessment and intervention may improve long-term outcomes after colorectal cancer resection in older adults. *Annals of surgery*. 2011 May 1;253(5):867-74.
  20. Sayek F. The Results of surgical treatment in the elderly acute abdomen patients. *Turk J Geriatr*. 1998; 2:5-9.
  21. Barlow AP, Zarifa Z, Shillito RG, Crumplin MK, Edwards E, McCarthy JM. Surgery in a geriatric population. *Annals of the Royal College of Surgeons of England*. 1989 Mar;71(2):110.
  22. Hamzaoğlu İ, Ulualp K, Balkan T, Şirin F. Abdominal emergencies in octogenarians.
  23. Cancers after the age of 75. *Cancer Society of Finland*.
  24. Liu LL, Leung JM. Predicting adverse postoperative outcomes in patients aged 80 years or older. *Journal of the American Geriatrics Society*. 2000 Apr;48(4):405-12.
  25. Pedersen T, Eliassen K, Henriksen EA. A prospective study of mortality associated with anaesthesia and surgery: risk indicators of mortality in hospital. *Acta Anaesthesiologica Scandinavica*. 1990 Apr;34(3):176-82.
  26. Mehta A, Dultz LA, Joseph B, Canner JK, Stevens K, Jones C, Haut ER, Efron DT, Sakran JV. Emergency general surgery in geriatric patients: a statewide analysis of surgeon and hospital volume with outcomes. *Journal of Trauma and Acute Care Surgery*. 2018 Jun 1;84(6):864-75.