SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://saspjournals.com/sasjs/

OPEN ACCESS

A Study of Outcome of Elderly Patients Undergoing Acute Surgical Procedures

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| **Received:** 07.02.2019 | **Accepted:** 16.02.2019 | **Published:** 28.02.2019
DOI: 10.21276/sasjs.2019.5.2.6

Abstract | **Original Research Article**

Objective: To evaluate the outcome of elderly patients undergoing acute surgical procedures. ***Methods:*** This was a non-comparative and non-randomized prospective clinical study. All the patients of age 65 years & above who underwent emergency general surgeries under general/epidural/spinal anaesthesia in the institute were included in the study. Patient's comorbid conditions, post-hospital complications and in-hospital mortality were assessed. Charlson Comorbidity Index Score was calculated. ***Results:*** More than one third of patients were between 65-70 years of age (46.3%). Perforation peritonitis was the most common diagnosis (46.3%). The overall mortality was in 5 (9.3%, 95%CI=4.0-19.9) patients. Diabetes mellitus and hypertension was present among 44.4% and 40.7% patients respectively. Charlson Comorbidity Index <5 was among 53.7% patients and Charlson Comorbidity Index ≥5 was among 46.3% patients. Gastrointestinal was the most common post-op complication (48.1%). ***Conclusion:*** The surgical outcome of a surgical operation in the elderly will be dependent on the physical status of the patient preoperatively. More than the age per say, the delay in presentation may be the cause for mortality in this age group.
Key words: Geriatric patients, Charlson comorbidity index; Comorbidity, Mortality, Emergency.

INTRODUCTION

Life expectancy and the geriatric population have increased steadily in recent decades. By 2030, people more than 65 years will account for 20% of overall population [1]. The society is continuing to age and with luck, fortunately this trend is continuing. Advances in healthcare systems have empowered people to live long time and to remain healthy for a significantly greater amount of time. In the present, major surgical operations are presented to increase numbers of geriatric patients. As in other surgical specialties, the frequency of digestive operations performed in elderly patients and even in subgroups of older patients has been increased [2].

Patients above 65 years old accounts for about half of all the emergency operations with 75% of operative mortality [2]. Geriatric patients are often considered as high risk surgical patients. Consequently, elective surgery may not be performed with the result that a potentially treatable disease process may develop into an acute catastrophic event [1].

Comorbidity can be defined as "the existence or occurrence of any distinct additional entity during the clinical course of a patient who has the index disease under study"[3]. Unlike complications which are sequellae of the principal diagnosis or its treatment, comorbidities are causally unrelated to the primary diagnosis [4]. The type, number and severity of comorbid conditions will determine the extent of their influence on treatment outcomes. The presence of comorbid conditions may adversely influence treatment choice through the selection of "too much or too little"[5,6].

The present study was conducted to evaluate the outcome of elderly patients undergoing acute surgical procedures

MATERIALS AND METHODS

This was a non-comparative and non-randomized prospective clinical study. All the patients of age 65 years & above who underwent emergency general surgeries under general/epidural/spinal anaesthesia in the institute were included in the study. Patient with advanced malignancies (metastatic disease), cardiac surgeries, neurosurgeries, orthopedic surgeries and ENT surgeries were excluded from the study. Patient's comorbid conditions, post-hospital complications and in-hospital mortality were assessed. The study was approved by the Ethical Committee of the Institute. The consent was taken from each participant before including in the study.

Charlson Comorbidity Index Score (CCI score): This index contains 19 categories of comorbidity & assigns a weighted value to each comorbidity based on the risk of 1 year mortality. A score of '0' reflects no comorbidities and 19 reveal severe comorbidities.

Statistical analysis

The results are presents in frequencies and percentages. The Chi-square test was used for comparisons. The p-value<0.05 was considered significant. All the analysis was carried out on SPSS 16.0 version (Chicago, Inc., USA).

RESULTS

More than one third of patients were between 65-70 years of age (46.3%) followed by 70-75 (25.9%), 75-80 (18.5%) and >80 (9.3%). More than half of patients were males (66.7%) (Table-1).

Perforation peritonitis was the most common diagnosis (46.3%). Instestinal Obstruction was the second most common diagnosis (33.3%). Cellulitis and Abscess was the least common diagnosis (20.4%) (Table-2).

The overall mortality was in 5 (9.3%, 95%CI=4.0-19.9) patients (Fig.1). Diabetes mellitus and hypertension was present among 44.4% and 40.7% patients respectively. However, chronic obstructive pulmonary disease and ischaemic heart disease was present among 29.6% and 27.8%. The mortality was higher among the patients of renal comorbidity (10%) followed by hypertension (9.1%), ischaemic heart disease (6.7%) and diabetes mellitus (4.2%). Only renal comorbidity was significantly (p=0.03) associated with mortality (Table-3).

Charlson Comorbidity Index <5 was among 53.7% patients and Charlson Comorbidity Index ≥5 was among 46.3% patients. The mortality was higher among whom Charlson Comorbidity Index was ≥5 (16%) than <5 (3.4%). However, the association of Charlson Comorbidity Index was statistically insignificant (p>0.05) (Table-4).

Gastrointestinal was the most common post-op complication (48.1%). Respiratory system was the second most common post-op complication (33.3%) and genitourinary was the third most common post-op complication (27.8%). Bleeding was the least common post-op complication (1.9%). The highest morality was found among whom respiratory system post-op complication was present (16.7%). There was significant (p=0.01) association of mortality with cardiovascular system and respiratory system post-op complications (Table-5).

Table-1: Basic profile of patients

Basic profile	No.(n=54)	%
Age in years		
65-70	25	46.3
70-75	14	25.9
75-80	10	18.5
>80	5	9.3
Gender		
Male	39	66.7
Female	18	33.3

Table-2: Distribution of diagnosis

Diagnosis	No. (n=54)	%
Instestinal Obstruction	18	33.3
Perforation Peritonitis	25	46.3
Cellulitis and Abscess	11	20.4

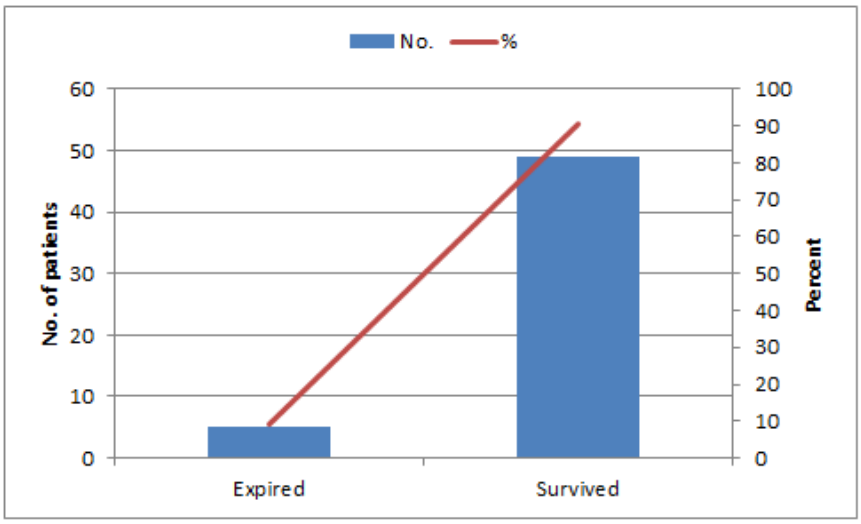

Fig-1: Distribution of mortality

Table-3: Comparison of comorbid conditions with outcome

Comorbid conditions#	No. of patients		Outcome				p-value[1]
			Expired		Survived		
	No.	%	No.	%	No.	%	
Hypertension	22	40.7	2	9.1	20	89.9	0.08
Diabetes mellitus	24	44.4	1	4.2	23	95.8	0.25
Ischaemic heart disease	15	27.8	1	6.7	14	93.3	0.10
Chronic Obstructive pulmonary disease	16	29.6	0	0.0	16	100.0	-
Central Nervous System and Neuromuscular Disorders	11	20.4	0	0.0	11	100.0	-
Renal	10	18.5	1	10.0	9	90.0	0.03*
Other	4	7.4	0	0.0	4	100.0	-

#Multiple response, [1]Chi-square test, *Significant

Table-4: Comparison of outcome with Charlson Comorbidity Index

Comorbid conditions	No. of patients		Outcome				p-value[1]
			Expired		Survived		
	No.	%	No.	%	No.	%	
< 5	29	53.7	1	3.4	28	96.6	0.11
≥5	25	46.3	4	16.0	21	84.0	

[1]Chi-square test

Table-5: Comparison of post-op complications with outcome

Post-op complications #	No. of patients		Outcome				p-value[1]
			Expired		Survived		
	No.	%	No.	%	No.	%	
Bleeding	1	1.9	0	0.0	1	100.0	-
Cardiovascular system	8	14.8	1	12.5	7	81.5	0.01*
Respiratory system	18	33.3	3	16.7	15	83.3	0.01*
Gastrointestinal	26	48.1	2	7.7	24	92.3	0.13
Genitourinary	15	27.8	1	6.7	14	93.3	0.10
Wound Infection	6	11.1	0	0.0	6	100.0	-
Other	3	5.6	0	0.0	3	100.0	-

#Multiple response, [1]Chi-square test

DISCUSSION

In this study, more than one third of patients were between 65-70 years of age (46.3%). More than half of patients were males (66.7%). Tilakdas *et al.* observed that over half of patients (55%) were between 60-65 years of age. Male predominance was observed in their study subjects with 72.5% males and 27.5% females [7]. The sex distribution in this study was similar to a study conducted by El-Haddawi *et al.* (Male: 53.8%, Female: 46.2%) [8]. In a similar study by

Lawrence *et al*. the percentage of male and females was 56% and 44% respectively [9].

Comorbid medical conditions and emergency situations adversely affect survival from surgical interventions. Older patients are simply at high risk for both concomitant medical disease and urgent situations and that is why surgery appears to be riskier in older individuals. In the present study, diabetes mellitus and hypertension was present among 44.4% and 40.7% patients respectively. However, chronic obstructive pulmonary disease and ischaemic heart disease was present among 29.6% and 27.8% respectively. Marita *et al*. showed that the most common comorbidity was hypertension (60%) followed by diabetes (57.5%)[10].

The overall mortality was in 5 (9.3%, 95%CI=4.0-19.9) in the present study (Fig.1). Chavan *et al.* reported higher mortality being 17% than this study[11]. Merani *et al*. found in-hospital mortality rate being 14.7% among geriatric patients undergone for emergency surgery [12].

In the present study, Charlson Comorbidity Index <5 was among 53.7% patients and Charlson Comorbidity Index ≥5 was among 46.3% patients. The mortality was higher among whom Charlson Comorbidity Index was ≥5 (16%) than <5 (3.4%). In a study, among patients with Charlson comorbidity grade 0, 5-year survival was 52%; among patients with Charlson comorbidity grade 1–2, it was 48% and among patients with Charlson comorbidity grade ≥3, it was 28%[13].

Postoperative events of particular concern are cardiac, pulmonary and cerebral injury and cognitive dysfunction [7]. In the present study, gastrointestinal was the most common post-op complication (48.1%). Respiratory system was the second most common post-op complication (33.3%) and genitourinary was the third most common post-op complication (27.8%). Bleeding was the least common post-op complication (1.9%). Chavan *et al*. reported that the most common post-operative complication was surgical site infection (30%)[11].

In the present study, perforation peritonitis was the most common diagnosis (46.3%). Instestinal Obstruction was the second most common diagnosis (33.3%). Cellulitis and Abscess was the least common diagnosis (20.4%). Tilakdas *et al*. reported that most common indication for emergency surgeries in their study was perforative peritonitis (32.5%) followed by small bowel obstruction and hemoperitonium (7.5% each)[7].

A major limitation of this study was the small sample size with only 54 elderly surgical patients identified at this single tertiary care center. But the study provided valuable insight into an understudied area. However, since this study was conducted at a single tertiary academic center, the results might not be applicable to other hospitals.

CONCLUSION

The surgical outcome of surgical operation in the elderly will be dependent on the physical status of the patient preoperatively. More than the age per say, the delay in presentation may be the cause for mortality in this age group.

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