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Research Article

OUTCOME OF GENERAL SURGERY IN ELDERLY AT KAUH

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Data were collected from the hospital's medical records system.

ABSTRACT

Introduction: With the rise in the number of elderly persons in the population, the need for general surgery is increasing. There are many problems facing older people undergoing surgical operations, and age, along with other risk factors such as diabetes mellitus, myocardial infarction, and renal failure, results in multiple postoperative complications, increasing mortality and morbidity rates. Moreover, older individuals need good health care. However, not enough studies are performed in this area of surgery. We aim to measure the rate of general surgery in the elderly and describe the risk factors and surgical outcomes.

Methods: A retrospective cross-sectional study was conducted on surgeries occur between (2014 to 2018) involving elderly patients (60 years and older) undergoing general surgery at king Abdulaziz University Hospital in Jeddah, Saudi Arabia. Data were collected from the hospital's medical records system. Our results were analyzed using IBM SPSS Statistics (Version 21.0) including Pearson's chi-square and correlation to define the relationship between variables.

Results: Among the 920 patients, the most common surgery performed on men was hernia repair; on women, cholecystectomy. Some complications appeared to be significant such as wound and respiratory infections. Out of all surgeries, exploratory laparotomy showed the highest mortality rates. In addition, there was a strong relationship between the duration of surgery and length of hospital stay.

Conclusion: There is an association between older age and higher rates of complications and mortality. That is due to older persons' declining body physiology along with reduced physical activity.

We recommend multi-centered research studies and more optimization in preoperative assessment to improve our outcomes

INTRODUCTION

Life expectancy has been increasing in developed countries in recent decades (1) due to improving primary prevention and health care regarding elderly populations (2). That in addition to health issue awareness, which resulted in a decrease in the prevalence of chronic illnesses in elderly individuals (3). According to the WHO, elderly is defined as people who are 60 years and above (4).

In Western countries, populations are seeing new characteristic demographic change, mainly towards aging, due to the falling numbers of births on the one hand and the rising numbers of elderly persons on the other. In fact, elderly people constitute more than 4% of the Canadian population. The pattern of growth is occurring not only in North America but also in Europe and Asia (5).

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There are several challenges in surgery for the elderly population with many risk factors, where any small invasive surgery may cause a significant effect (6). Besides that, elderly patients require more advanced health care, especially surgical care (7). This population is of great importance in hospitals, primarily due to their unique physiologic and pharmacologic attributes, along with psychosocial factors, all of which may impact various modalities of disease treatment and outcomes (5). For these reasons, clinicians should consider various risk factors without focusing on age alone (8).

Patients aged 80 years old and over are prone to risk factors affecting the preoperative assessment, the most frequent being hypertension (HTN), dyspnea, and others (9). In addition, age itself is a significant risk factor for surgical mortality and morbidity (7). Elderly patients are also at higher risk for postoperative complications including longer hospital stays (over four days) and intensive care unit (ICU) admission,

Therefore, poorer outcomes in some elective procedures are expected to be seen with older age (5).

Various studies took into consideration the important of elderly such as a study from New- Zealand in 2002 which stated that the population of 65 years old and above have a three-fold greater risk of needing a general surgical procedure (10). Furthermore, other studies have estimated that approximately 53% of all surgical procedures are performed on patients over the age of 65 (3, 11, 12)

On the other hand, a multicenter prospective study carried out in Egypt showed postoperative ICU admission as one of the risk factors for surgical outcomes in elderly patients (13)

Aging results in diminished functional reserve, alongside different comorbidities (14). On top of that, there is an increase in the elderly population and, subsequently, their surgical patients (5). Currently no studies have been conducted in this scope of surgery.

In this study, we aim to evaluate the prevalence of general surgery in elderly patients and determine the effects of risk factors such as HTN, diabetes mellitus (DM), and others on the surgical outcomes at King Abdulaziz University Hospital (KAUH) in Jeddah, Saudi Arabia.

METHODS

A retrospective cross-sectional study was approved by the Institutional Review Board KAUHand was conducted at KAUH. All patients aged 60 years old and over who underwent general surgical procedures between 2014 and 2018 were included. Statistical analysis was performed using IBM SPSS Statistics (Version 21.0).

Data were collected from hospital medical record which included 920 patients, then classified according to surgical procedure (cholecystectomy, hernia repair, amputation, exploratory laparotomy, simple mastectomy, modified radical mastectomy, hemicolectomy with anastomosis, excision lesion of breast, and others); method of surgery (open or laparoscopic); andwhether the procedure was elective orurgent. Collected data also included risk factors—myocardial infarction (MI), HTN, DM, dyslipidemia, stroke, renal failure (RF), dialysis, smoking, and obesity—and complications: deep vein thrombosis (DVT), pulmonary embolism (PE), readmission, leakage, wound infection, respiratory complications bleeding, delirium, gastrointestinal complications, sepsis, heart, central nervous system (CNS)complications, acute kidney injury (AKI), systemic inflammatory response syndrome (SIRS).

For our qualitative data we used Pearson's chisquare, and for quantitative data we used correlation. *P*values <0.05 were considered significant

RESULTS

We aimed in this study to explore outcomes, prevalence, and risk factors of general surgery in elderly patients (age 60 and over).

The total number of included patients who underwent general surgerywas 920 (470 men and 450 women); 586 elective vs334 emergency. The mean age at operation for bothgender was71.985±7.293 years. Figure 1 shows that the most common performed surgery on men was hernia repair, 118 operations, while forwomen: cholecystectomy, 78 operations. In addition, some comorbidities such as DM,MI and RFin those who had general surgeries appear statistically significant with body mass index (BMI) while smoking is not,Table1

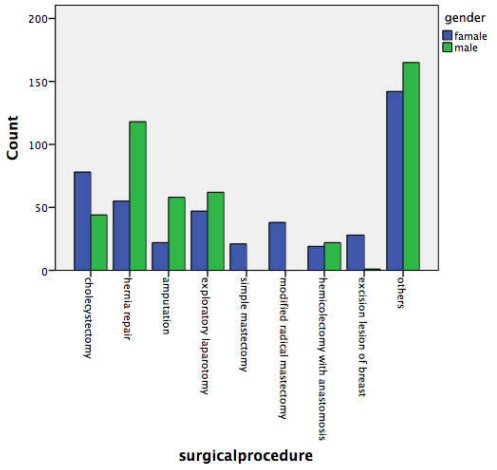

Figure 1 The frequency of Each surgical procedure

Table 1 General Surgery Risk Factors

	HTN	DM	Dyslipidemia	MI	Stroke	RF	Dialysis	Smoking
Surgical Procedure								
Colectomy	49	47	17	2	1	0	0	5
Hernia repair	83	48	16	7	0	2	0	24
Amputation	47	69	7	11	2	5	2	13
Exploratory laparotomy	52	37	5	3	1	0	3	15
Simple mastectomy	10	6	2	1	0	0	0	1
Modified radica mastectomy	16	11	3	2	0	0	0	1
Hemicolectomy with anastomosis	19	19	3	4	0	0	0	4
Excision lesion of breast	14	9	1	0	0	0	0	1
Other	129	122	19	8	1	0	0	37
*P*value	.300	.000	.242	.001	.430	.000	.012	.126

*Some patients had more than one complication (I explained each abbreviation above)

Regarding surgical complications, acute kidney injury (AKI), 0.9%, leakage (1.4%), wound infection (3.9%), respiratory complications (2.5%), DVT (0.4%), and sepsis (1.6%) they have statistically significant in correlation with surgical procedure. Wound infection was the most frequent complication in both emergency and elective surgeries (*P*=0.00). Some complications had higher mortalities, such as sepsis (1.6%), respiratory complications (2.5%), leakage (1.4%), PE (0.4%), and ICU admission (25%), their *P* values were (.000, .000, .002, .000, and .000, respectively). In addition, the total number of deaths for all the general surgeries was 78. Exploratory laparotomy showed higher mortality rate (31 deaths), whereas excision of breast lesionhad the lowest (0 deaths).There was a strong association (*r*=1) between duration of surgery and length of hospital stay (*P*=.000).

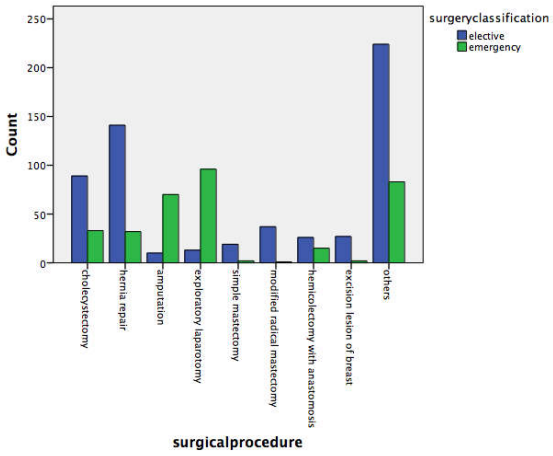

Figure 2 surgical procedure based on classification

Figure 2 shows that the commonest emergency surgery was exploratory laparotomy, 96 patients. Additionally, 7.33% of the patients who underwent exploratory laparotomy hadhigher rates of ICU admission.

Table 2 Type of Anesthesia According to Surgery Classification

	Elective	Emergency	Total (n)
Type of anesthesia			
General	457	242	699
Spinal	92	63	155
Epidural	105	37	142
Local	50	36	86

Table 2 shows a general anesthesia is the more frequently used type of anesthesia in both classifications followed by epidural in elective class and spinal in emergency class. Whereas, epidural represent significant P-value= 0.008

We classified patients according to method of surgery into two groups, laparoscopy, 181(19.7%) and open, 739 (80%); 208 of the open surgeries lead to ICU admission (*P*=.00).

DISCUSSION

A study designed to measure the prevalence, risk factors and outcomes of general surgery in patients who are 60 years old and over.

We found that the mean age of woman and men were approximately similar (71.89±7.25 vs 72.09±7.33 years, respectively). Besides that, the most frequently performed surgery in our study was hernia repair. This and other studies show that the most common general surgery in elderly persons is hernia repair (15).

As the elderly population is growing along with, consequently, the need for surgical services, inguinal hernia repair is the commonest operation in the elderly population as a result of weakening of the abdominal wall muscles and an increase in intra-abdominal pressure.(16)In contrast, results from a 2012 study revealed the most common general surgery in elderly persons to be partial colon resection. (17)

According to our study, the most common emergency surgery in elderly patients was exploratory laparotomy, which accounted for 96 patients. There are few studies that disagree with us, for example, a study from the United States (USA) revealed that hernia repair was the most operated surgery (17% of cases) among the elderly group. (5)

factors in our study were DM, MI, RF, and dialysis. Surprisingly, the results show that HTN in the elderly was not significant with surgical procedure, although 419 out of 920 patients were hypertensive. In a study from Brazil, 26% of the study population were obese (18). In our study, obese patients represented 35.3% of the population, explaining the significance between surgery and BMI.

In the present study, we identified a total of 78 (8.5%) elderly patients who died after general surgery; 45 of those deaths were caused by complications. In contrast, a study conducted in Canada in 2014 showed that elderly patients who received surgery had a mortality rate of 14.7%.(19) Accordingly, ICU admission and respiratory problems were the most frequent complications to cause mortalities in our population with the percentages of 25% and 2.5%, respectively. In a published study, the most common complication following general surgery was respiratory related (7.1%).(19)Another study conducted in Canada mentioned that pulmonary complications can lead to prolonged ICU stays and increase elderly mortality.(20) However, another published study showed an insignificant correlation between elderly patients and postoperative complications.(5)

Accordingly, we found that the most frequently occurring complication after surgery (elective and emergency) was wound infection. The results of a study done in Canada in 2015 showed that wound infection was the most common complication with a percentage of 20%, which agrees with our result. (21) Another research conducted in USA also documented similar results: the most frequently encountered postoperative complications were gastrointestinal and wound infection. (22) Other study noted that respiratory and cardiovascular problems had the greatest incidences.(23)

Elderly patients are commonly assumed to be at greater risk after surgery for death than any other age group. (24)Our cross-sectional study showed that mortality during hospital stay was about (8.5%) of all surgeries. Other studies showed different results, one published in 2012 which had 4% deaths from surgeries, (25) and another from 2016 with a 19% mortality rate after surgeries.(26)

We found that exploratory laparotomy had the highest mortality (28.4%), whereas, in a UK study, the exploratory laparotomy mortality percentage was 25%.(26)In addition, one month after surgery, elderly patients were found to be more sick, had more complications, and stayed longer in hospital, as death result of these consequences (27) which agrees our results.

Studies show that elderly patients are more sensitive to anesthesia. Despite this, old age is not a contraindication for any type of anesthesia, general or regional. However, regional anesthesia gives better postoperative outcomes. (28) Epidural anesthesia, specifically, gives better analgesic effect (29) which go along with our result.

A shortcoming of our study is that our database did not include all elderly surgical patients in Jeddah, Saudi Arabia, and that there are insufficient studies on general surgery in elderly patients in this century But still, these data are useful additions to the evidence base.(23)

CONCLUSION

We aimed to identify the prevalence, outcome, and risk factors among elderly patients 60 years and above undergoing general surgery.

Surgery in the elderly has major challenges and requires extensive experience, because of its association with many risk factors that are contributing to the challenges, for example, DM, renal failure, and others which may lead to higher mortality rates and complications including PE, leakage, and ICU admission.

All mentioned complications may result from the physiology of the aging body. The older persons' health is declining as they age and, as a result of that, the added physical stress of surgery makes them more prone to postoperative complications and mortality.

Based on that, we recommend that future studies including multiple centers to represent all of the Saudi population. Moreover, patients need preoperative optimization in order to reduce the duration of surgeries and for more favorable outcomes.

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