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ARAŞTIRMA YAZISI / RESEARCH ARTICLE

85 YAŞ VE ÜZERİ HASTALARDAKİ ANESTEZİK YAKLAŞIMLARIMIZIN RETROSPEKTİF İNCELENMESİ

A RETROSPECTIVE ANALYSIS OF ANESTHETIC APPROACHES IN PATIENTS AGED 85 AND ABOVE

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ÖZET

AMAÇ: Yaşlanma ile birlikte oluşan değişiklikler nedeniyle yaşlılar daha fazla tıbbi desteğe gereksinim duyarlar. Bu tıbbi gereksinimler içerisinde cerrahi operasyonlarda yer almaktadır. Çalışmamızda 85 yaş ve üzeri hastalarda anestezik yaklaşımlarımızı incelemeyi, geliştirmeyi ve güncel literatürle kıyaslamayı amaçladık.

GEREÇ VE YÖNTEM: Ocak 2020 – Ocak 2022 tarihleri arasında 85 yaş ve üzeri olup operasyona alınan 242 hasta çalışmaya dahil edildi. Hastaların cinsiyeti, yaşı, ek hastalıkları, operasyon sırasında uygulanan anestezi tipleri, operasyon süreleri, postoperatif servis/yoğun bakım takip süreleri, intraoperatif kan ürünü kullanımı ve postoperatif mortalite gibi verileri, uygulanan anestezi türlerine göre genel, spinal ve sedasyon anestezisi olmak üzere 3 grupta retrospektif olarak incelendi.

BULGULAR: Hastaların 130'u kadın, 112'si erkekti. Yaş ortalamaları 87,95±2,57 idi. Hastaların % 93,8'inde ek hastalık mevcuttu. Hastaların %65,3'üne genel anestezi, %29,8'ine spinal anestezi ve %4,9'una sedasyon anestezisi uygulandı. Ameliyat sonrası hastaların %30,6'sı yoğun bakıma çıkarken, %69,4'ü servise çıktı. Hastaların %88'i şifa ile taburcu oldu, %12'si ilk 1 ayda exitus oldu. Mortalite görülenlerde %86,2 genel anestezi, %13,8 spinal anestezi uygulandı, mortalite gözlenmeyenlerde %62,4 genel anestezi, %5,6 sedasyon anestezisi, %31,4 spinal anestezi uygulandı (p=0,036). Mortalite en çok genel cerrahi hastalarında, yoğun bakıma çıkan hastalarda ve ASA III hastalarda gözlendi. Kan ürünü kullanılanlarda kullanılmayanlara göre mortalite daha fazla gözlendi (p<0,001).

SONUÇ: Uygun, yaşlı hastalarda spinal anestezinin tercih edilmesi, kan ürünü kullanımı ve postoperatif yoğun bakıma çıkış endikasyonlarında daha dikkatli olunması gerektiğini düşünmekteyiz.

ANAHTAR KELİMELER: Yaşlı, Geriatri, Genel anestezi, Ölüm, Spinal Anestezi.

ABSTRACT

OBJECTIVE: Due to the changes that occur with aging, the elderly need more medical support. These medical requirements include surgical operations. In our study, we aimed to examine, improve and compare our anesthetic approaches for people aged 85 and above with the current literature.

MATERIAL AND METHODS: A total of 242 patients aged 85 years and above underwent surgery between 01.01.2020 and 01.01.2022 were included in this study. The data of the patients including gender, age, comorbidities, types of anesthesia administered during the surgery, duration of surgery, postoperative ward/intensive care unit (ICU) follow-up periods, intraoperative blood product usage and postoperative mortality were retrospectively analyzed in 3 groups according to the types of anesthesia administered: general, spinal and sedation anesthesia.

RESULTS: Of the patients, 130 of the patients were female and 112 were male. The mean age was 87.95±2.57 years. 93.8% of patients had comorbidities. 65.3% of the patients were applied general anesthesia, 29.8% spinal anesthesia and 4.9% sedation anesthesia. While 30.6% of the patients were admitted to ICU after surgery, 69.4% of them were admitted to the ward. While 88% of the patients were discharged with recovery, 12% died in the first 1 month. While 86.2% general anesthesia and 13.8% spinal anesthesia were applied in patients with mortality, 62.4% general anesthesia, 5.6% sedation and 31.4% spinal anesthesia were applied in those without mortality (p=0.036). Mortality was mostly observed in general surgery patients, patients admitted to intensive care unit, and ASA III patients. Mortality was observed more in those who used blood products compared to those who did not (p<0.001).

CONCLUSIONS: We think that spinal anesthesia should be preferred in appropriate elderly patients and more caution should be exercised in indications for blood product use and postoperative intensive care unit admission.

KEYWORDS: Elderly, Geriatrics, General Anesthesia, Mortality, Spinal anesthesia.

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INTRODUCTION

Estimates place the number of persons over 60 in the world at an all-time high of 1.2 billion by 2025 and 2 billion by 2050, most of whom would live in developing countries (1, 2). All facets of society are impacted by this demographic transformation, which offers both tremendous potential and challenges (2). All around the world, the percentage of older people is predicted to rise (3).

Aging is a universal and progressive physiological condition characterized by degenerative changes in both the structure and functions of organs and tissues (4). The physiological and psychological changes that occur with aging and delayed recovery processes have led to older people needing more medical treatment (5). In addition, morbidity and mortality increase depending on the anesthesia and surgery preferred in patients aged 65 and over (6). For this reason, a special place should be reserved for the geriatric age group in anesthesia applications. An appropriate anesthetic technique should be chosen to minimize hemodynamic changes and maintain a near-normal physiological state (7). Although there are studies in the literature on anesthesia methods in patients older than 65 years, we did not find any studies comparing anesthesia methods in elderly patients older than 85 years.

In this study, we aimed to see the effects of the type of anesthesia on postoperative hospital stay and mortality in elderly patients. We also aimed to see the effects of Alzheimer's disease and dementia, which are common in this age group and intraoperative blood product use on postoperative discharge and mortality.

MATERIALS AND METHODS

Age, gender, comorbidity, preoperative echocardiography (ECHO) reports, anesthesia types, distribution of surgeries according to surgical branches, intraoperative use of blood products, postoperative discharge status, the length of stay in the ward and/or intensive care unit, and mortality were investigated retrospectively. Afterward, the patients were evaluated in detail by classifying them in terms of mortality, use of blood products, and Alzheimer's-dementia. Patients whose complete data were not available or who had a change in anesthesia method during the operation were not included in the study. Before the trial began, informed consent was acquired from the patients and their guardians. Patient data were examined in 3 groups according to the anesthesia method applied: patients who received general anesthesia, spinal anesthesia and sedation anesthesia.

Ethical Committee

The study was approved by Afyonkarahisar Health Science University Non-Interventional Clinical Studies Ethics Committee (No:2011-KA-EK-2, 15.04.2022). In this retrospective study, patients aged 85 and over who underwent anesthesia between January 2020 and January 2022 were included after the approval of the Ethics Committee. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Statistical Analysis

IBM SPSS Statistics 20 version (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Data were expressed as ratio, median; Interquartile Range (IQR), mean ± standart deviation (SD), and conformity of variables to normal distribution was determined by visual (histogram) and analytical methods (Kolmogorov-Smirnov test). Student T or Mann-Whitney U test was used to compare continuous variables, Kruskal-Wallis test was used for triple variables, and Chi-square test was used to compare categorical variables. A p values of lower than 0.05 were considered statistically significant.

RESULTS

A total of 242 patients aged 85 years and older who were operated in our hospital between January 2020 and January 2022 were included in our study. 130 of the patients were female and 112 were male, mean age was 87.95±2.57.The mean body mass index (BMI) of the patients was 26.11±3.99. 32.6% of the patients were ASA II, 57.9% ASA III and 9.5% ASA IV. Comorbid disease was present in 93.8% of the patients. The most common comorbidity was hypertension with 70.7%. Echocardiography results were available for a total of 39 (16.1%) patients and the distribution of valvular diseases was as shown in **(Table 1)**.

Table 1: Demographic data, comorbiditiesand ECHO results of patients

	n=242
Gender, F/M, n (%)	130 (53.7) /112 (46.3)
Age, year, mean ± SD	87.95 ± 2.57
BMI, mean ± SD	26. 11 ± 3.99
ASA, n (%)	
II	79 (32.6)
III	140 (57.9)
IV	23 (9.5)
Comorbidity, none /yes, n (%)	15 (6.2) /227 (93.8)
HT, none /yes, n (%)	71 (29.3) / 171 (70.7)
DM, none /yes, n (%)	197 (81.4) / 45 (18.6)
CAD, HF, none/yes, n (%)	158 (65.3) / 94 (34.7)
COPD, asthma, none/yes, n (%)	205 (84.7) /37 (15.3)
Malignancy, none/yes, n (%)	224 (92.6) / 18 (7.4)
Hypothyroidism, none/yes, n (%)	231 (95.5) / 11 (4.5)
CVD, none/yes, n (%)	230 (95) / 12 (5)
CRF, none/yes, n (%)	226 (93.4) / 16 (6.6)
Alzheimer, dementia, none/yes, n (%)	201 (83.1) / 41 (16.9)
EF %, median;IQR	55;15
PAP mmHg, median;IQR	35;33
ECO, n (%)	
MR	1 (2.6)
TR	7 (17.9)
AR	3 (7.7)
AR+MR+TR	15 (38.3)
MR+TR	13 (33.3)

Datas were expressed as number of patients (%), mean ± Standart Deviation (SD)and median; Inter quartile range(IQR)BMI; Body Mass Index, F/M; Female/Male, ASA; American Society of Anesthesiologists, HT; Hypertension, DM; Diabetes Mellitus, CAD; Coronary Artery Disease, HF; Heart Failure, COPD; Chronic Obstructive Pulmonary Disease, CVD; Cerebrovascular Diseases, CRF; Chronic Renal Failure, EF; Ejection Fraction, PAP; Pulmonary Artery Pressure, ECHO; Echocardiography, MR; Mitral Regurgitation, TR; Tricuspid Regurgitation, AR; Aortic Regurgitation

While 60.7% of the patients were taken to surgery for elective operation, 39.3% of them were taken to the operation urgently. General anesthesia 65.3%, spinal anesthesia 29.8%, and sedation 4.9% were applied to the patients **(Table 2)**.

Table 2: Surgical characteristics and mortality of the patients

	N=242
Anesthesia method, n (%) General Sedation Spinal	 158 (65,3) 12 (4,9) 72 (29,8)
The departments where the surgeries were performed, n (%) Orthopedic General Surgery Neurosurgery Thoracic Surgery Gynecology Eye Diseases Plastic Surgery Urology Ear, Nose & Throat Cardiovascular Surgery	 87 (36) 110 (45.5) 7 (2.9) 2 (0.8) 1 (0.4) 4 (1.7) 7 (2.9) 22 (9.1) 1 (0.4) 1 (0.4)
General Surgery operations Mesenteric ischemia -ileus İncisional-inguinal Hernia ERCP Cholecystectomy	 16 (14.5) 9 (8.1) 69 (62.7) 16 (14.5)
Surgery Type, n (%) Elective Urgent	 147 (60.7) 95 (39.3)
Duration of surgery, minute, mean± SS	122 ± 58.69
Postoperative discharge, n (%) Intensive care unit Ward	 74 (30.6) 168 (69.4)
Duration of hospital stay, day, median; IQR	7 ;9
Mortality, n (%) none First 7 days 8th-30th days	 213 (88) 13 (5.4) 16 (6.6)
Blood product usage, none/yes, n (%)	212 (87.6) /30 (12.4)

Datas were expressed as number of patients (%), mean ±standart deviation (SD), median; Inter quartile Range (IQR). ERCP; endoscopic retrograde cholangiopancreatography

When the distribution of surgeries performed is examined; the surgeries performed were mostly (45.5%) in the general surgery department, while the lowest rate was in the gynecology, otorhinolaryngology (ORL) and cardiovascular surgery (CVS) departments (0.4%). Endoscopic Retrograde Cholangiopancreatography (ERCP) constituted 62.7% of general surgery cases, while mesenteric ischemia-ileus 14,5%, cholecystectomies 14,5%, and hernias 8,1%, respectively. While 30.6% of the patients were admitted to the intensive care unit after the surgery, 69.4% of them were admitted to the ward. While the mean operation time of the patients was 122±58.69 minutes, the median hospital stay was 7 days. During surgery, 12.4% of the patients used blood products. While 88% of the patients were discharged with a cure, 5.4% died within the first 7 days and 6.6% died between days 8-30 (Table 2). In **Table 3**, when we classified the patients according to their mortality status, no statistical difference was observed in terms of gender (p=0.15) and type of surgery (p=0.061), while in terms of the distribution of surgeries performed according to departments (p=0.043), anesthesia methods (p=0.036), duration of operation (p=0.003) and postoperative discharge (p<0.001) were found significant. General anesthesia was administered more frequently in patients with mortal than in patients who survived (p=0.036). Of the patients with mortality, 58.6% were ASA III patients, 34.5% were ASA IV patients, and 6.9% were ASA II patients. In none of the operations were patients routinely discharged to the intensive care unit postoperatively. Patients who needed mechanical ventilation, patients who were debilitated, postoperatively hypotensive, and who had massive intraoperative bleeding were followed in the postoperative intensive care unit. While 72.4% of those with mortality were patients who went to the intensive care unit, 75.4% of those who did not have mortality constituted the patients who went to the ward. Among the patients with postoperative mortality, the highest rate was seen in General Surgery patients with 51.7%, Orthopedics patients with 31%, Neurosurgery patients with 10.3%, and Urology and ENT patients with 3.4% (Table 3). If we examine the mortality rate in general surgery patients in detail, 46.7% of the 15 patients with mortality had mesenteric ischemia-ileus, 6.7% had incisional hernia, 33.3% had ERCP, 13.3% had cholecystectomy and the mortality distribution was statistically significant (p=0.002, Table 3).

Table 3: Comparison of Patients According to Mortality Status

	Patients died (n=29)	Patients alive (n=213)	p
Gender, F/M, n (%)	12 (41.4) /17 (58.6)	118 (55.4) / 95 (44.6)	0.155
ASA, n (%) II III IV	 2 (6.9)/ 17 (58.6)/ 10 (34.5)	 77 (36.2)/ 123 (57.7)/ 13 (6.1)	<0.001*
Surgery type, n (%), Elective/emergency	 13 (44,8) / 16 (55,2)	 134 (62.9) /79 (37.1)	0.061
Department of surgeries, n(%) Orthopedic, General Surgery Neurosurgery Thoracic Surgery Obstetrics & Gynecology Eye Diseases Urology Plastic Surgery Ear, Nose & Throat Cardiovascular Surgery	 9 (31) 15 (51.7) 3 (10.3) 0 0 0 1 (3.4) 0 1 (3.4) 0	 78 (36,6) 95 (44.6) 4 (1.9) 2 (0.9) 1 (0.5) 4 (1.9) 21 (9.9) 7 (3.3) 0 1 (0.5)	0.043*
General Surgery Mesenteric ischemia-Ileus Incisional-Inguinal hernia ERCP Cholecystectomy	 7 (46,7) 1 (6,7) 5 (33,3) 2 (13,3)	 9 (9,5) 8 (8,4) 64 (67,4) 14 (14,7)	0,002*
Anesthesia method General Sedation Spinal	 25 (86.2) 0 4 (13.8)	 133 (62.4) 12 (5.6) 68 (31.9)	0.036*
Duration of surgery, minute, median; IQR	140;170	90;95	0.003#
Postoperative discharge, Intensive care unit Ward	 21 (72.4) 8 (27.6)	 53 (24.6) 160 (75.4)	<0.001*

Datas were expressed as number of patiens (%)and median; Inter quartile Range (IQR). *Chi Square, #Mann - Whitney U

The comparison of anesthesia methods and mortality in patients with and without Alzheimer's dementia in our study were shown in **Table 4**.

Table 4: Comparison of Anesthesia Methods and Mortality Rates in Patients with Alzheimer's-Dementia

	Alzheimer's-Dementia, absent (n=201)	Alzheimer's-Dementia, present (n=41)	Total (n=242)	*P*
Anesthesia method, n (%) General Spinal Sedation	 140 (69.7) 52 (25.9) 9 (4.5)	 18 (43.9) 20 (48.8) 3 (7.3)	 158 (65.3) 72 (29.9) 12 (5)	 0.007*
Mortality, yes /no, n (%)	23 (11.4) / 178 (88.6)	6 (14.6) / 35 (85.4)	29 (12) / 213 (88)	0.566
Duration of hospital stay, day, median; IQR	5;4.5	7;10.5	5;5	0.046#

Data were expressed as number of patients(%), and median; Interquartile Range (IQR), *ChiSquare, Mann - Whitney U

Patients with Alzheimer's dementia utilized spinal anesthesia more frequently (48.8%), whereas patients without the disease used general anesthesia more frequently (69.7%). This difference was statistically significant (p=0.007, Table 4). While there was no statistically significant difference in mortality between patients with and without Alzheimer's dementia (p=0.566), patients with Alzheimer's dementia had a considerably longer median length of hospital stay than individuals without the condition (p = 0.046, Table 4). In Table 5, comparisions of the blood products usage and the anesthesia method applied, the type of surgery, the ASA status, and the mortality relationship were seen. While there was no significant relationship between the use of blood products and the anesthesia method (p=0.217), the ASA status (p=0.329), there was significance between the type of surgery (p=0.021) and mortality (p<0.001). Of the patients who used blood products, 80% were elective and 20% were emergency cases; in contrast, 42% of the patients who did not use blood products were elective. Furthermore, the rate of blood product use in emergency surgeries was 6.3%, while the rate of blood product use in elective cases was 16.3%. Forty percent of the patients who took blood products died, compared to eight percent of those who did not **(Table 5)**.

Table 5: Blood usage of patients

	Blood usage, no(n=212)	Blood usage, yes(n=30)	*P*
Anesthesia type, General Sedation Spinal	 140 (66)/ 12 (5.7)/ 60 (28.3)	 18 (60)/ 0/ 12 (40)	 0.217
Type of surgery, Elective Urgent	 123 (58)/ 89 (42)	 24 (80)/ 6 (20)	 0.021
ASA II III IV	 71 (33.5)/ 123 (58)/ 18 (8.5)	 8 (26.7)/ 17 (56.7)/ 5 (16.7	 0.329
Mortality Yes /no	 17 (8)/195 (92)	 12 (40)/ 18 (60)	 <0.001

Data were given as number of patients (%).*Chi-Square

DISCUSSION

According to the data obtained today, while 15% of the population in developed countries is 65 years and older, more than 10% of this elderly population is over the age of 85 (8). Although there are many studies on the elderly patient population in the literature, we did not find many studies related to anesthesia and mortality in patients over the age of 85. The most important results of this study; while 86.2% general anesthesia and 13.8% spinal anesthesia were applied in patients with mortality, 62.4% general anesthesia, 5.6% sedation and 31.9% spinal anesthesia were applied in those without mortality, this difference was statistically significant (p= 0.036). While mortality was mostly observed in general surgery patients, it was most frequently observed in patients admitted to intensive care unit and in ASA III patients. Mortality was observed to be higher in those who used blood products compared to those who did not (p<0.001). Spinal anesthesia was used more frequently in patients with Alzheimer's-dementia (p=0.007), and no significant difference in mortality was observed between those with and without Alzheimer's-dementia (p=0.566).

Physiological differences seen with aging, comorbidities, type of surgery, postoperative pain

management and preferred anesthesia affect morbidity and mortality. The incidence of cardiac, pulmonary and endocrine diseases have increased in patients over 80 years of age (9). In our study, 93.8% of the patients had additional diseases. The most common co-morbidities were; hypertension, coronary artery disease, diabetes mellitus, and chronic obstructive pulmonary disease. Hypertension is one of the most common diseases in the elderly and is the main risk factor for cardiovascular and cerebrovascular diseases such as heart failure and stroke (10). As the age of the population increases, the prevalence of hypertension increases linearly, exceeding 60% in people aged 60 and over and 70% in people aged 70 and over (11). Recent findings also highlight the role of hypertension in the pathogenesis of Alzheimer's disease. Decreased cerebral blood flow due to atherosclerosis resulting from long-standing hypertension suggests that hypertension may be an important biological pathway linking cognitive decline and dementia (12). Alzheimer's disease is one of the main causes of senile and pre-senile dementia, characterized by memory loss, mental retardation and loss of fine motor skills (13). Dementia also includes progressive cognitive decline with at least one impaired cognitive domain (such as language, reasoning, visual perception) that hinders functionality (14). According to a study by Seitz et al. in which a total of 15 case-control studies were included, no significant association was found between exposure to general anesthesia and the risk of Alzheimer's disease (15). In another population-based retrospective cohort study conducted by Seitz et al.; when patients with dementia who received general anesthesia were compared with those who received regional anesthesia; it was observed that anesthesia type did not affect postoperative 30-day mortality, hospital stay and postoperative complications (16). In our study, general anesthesia was used more frequently in patients without Alzheimer's dementia, and spinal anesthesia was used more frequently in patients with Alzheimer's dementia. Similar to these studies, there was no significant difference in mortality in patients with and without Alzheimer's dementia. Preservation of perioperative hemodynamics, reduction of complications (such as hypotension, embolism, mortality), reduction of bleeding, and minimizing the length of stay in the postoperative intensive care unit and hospital should be determined as the main objectives for determining the anesthesia method to be applied in the elderly. Neuraxial anesthesia has physiological advantages such as reducing post-operative hypercoagulability in elderly patients, reducing the risk of respiratory depression, and suppressing the response to surgical stress (9). General anesthesia should be preferred to control blood pressure in elderly people with severe cardiovascular disease (17).

In the study of Li et al. (18) in which they examined anesthesia-induced mortality rates, it has been suggested that the mortality rate due to anesthesia is high starting from the age of 75. In the study conducted by Kojima et al. on 406 patients aged 80 and over, the independent risk factors that reduced survival were male gender, bed ridden life, and abdominal surgery (19). In our study, the highest mortality was seen in general surgery operated patients. We think that the reason is due to the fact that it took the highest place in the population included in the study, and the number of higher emergency operations. In addition, ERCP operations constitute a large proportion of general surgery operations and ERCP procedures performed in outpatient surgery clinic are a riskier group of procedures.

In the meta-analysis conducted by Parker et al. with 2305 patients, it was concluded that regional anesthesia reduced the mortality rates in the first 30 days, but there was no difference between them when compared with general anesthesia in terms of long-term mortality rate such as 3 months (20). Again, in the study of Şahin et al. they compared spinal, general and epidural anesthesia techniques and stated that there was no significant difference between these groups in terms of mortality rates on the 7th and 30th days of the patients (21). In our study, no significant difference was found on mortality in terms of gender and emergency or elective surgery type. However significant differences were found in terms of the distribution of surgeries according to departments, anesthesia management and postoperative intensive care needs. Mortality rates were higher in patients who underwent general anesthesia and admit-

ted to the postoperative intensive care unit. General anesthesia may have been preferred more due to the prevalence of cardiovascular diseases and the high rate of emergency operations.

Reasons such as susceptibility to hypovolemia due to advanced age and anemia make it more difficult to maintain hemodynamic stability during intraoperative bleeding. It is expected that fewer hypertensive episodes will occur due to the suppression of the stress response with neuraxial anesthesia, and therefore less bleeding during surgery (22). In the literature, studies comparing general anesthesia and neuraxial anesthesia have reported that neuraxial anesthesia reduces bleeding and there is no significant relationship (23 - 26). In current study, while there was no significant relationship between the use of blood products and the anesthesia method, ASA classification of the patients, a significant relationship was found between the type of surgery and mortality. It has been observed that mortality increases as the use of blood products increases.

When the distribution of patients who received blood products according to the operations performed was analyzed, 63.3% of the patients underwent orthopedic surgery, 20% general surgery, 10% neurosurgery and 6.7% urology operations. And when these operations were classified as emergency/elective, 90.5% of the patients undergoing emergency operations were general surgery patients and 3.2% were orthopedic operations. Therefore, it was observed that blood and blood product use was higher in patients undergoing elective and orthopedic surgery. We believe that we should be more careful in elective orthopedic surgery patients in terms of patient blood management.

The most important limitation of our study was that it was a retrospective study. Some surgeries are inherently not suitable for spinal anesthesia and sedation anesthesia. Lack of standardization in terms of operations can lead to inconsistency of outputs. Therefore, the fact that our study included a wide variety of surgeries may have an effect on the results. The incomplete data such as the postoperative mortality reasons, irregular record keeping, and not being able to access the patients' hemodynamic data during the case were the limiting factors.

We concluded that blood product usage is associated with mortality and type of surgery.

On the other hand, anesthesia type does not affect mortality. In conclusion, prospective studies are needed to optimize surgical and anesthesia methods in elderly patients over 85 years of age, as these patients will be encountered more frequently in the coming years.

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