Altmış Beş Yaş Üstü Geriatrik Vakalarımızın Peroperatif Değerlendirmesi ve Postoperatif Erken Dönem Sonuçları; Retrospektif Analiz

Peroperative Evaluation and Postoperative Early Period Results of Geriatric Cases Over 65 Years Old: Retrospective Analysis

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Özet

Amaç: Geriatrik hastalarda anestezi uygulaması mortalite ve morbiditenin yüksek olması nedeniyle önem arz eder. Bu çalışmada geriatrik hasta grubundaki anestezi uygulamalarımızı ve erken dönem sonuçlarımızı değerlendirip sunmayı amaçladık.

Gereç ve Yöntem: Ocak 2013–Aralık 2013 tarihleri arasında nonkardiyak cerrahi geçiren toplam 357 hastanın dosyası retrospektif olarak taranarak; demografik özellikler, ASA sınıfı, eşlik eden hastalıklar, kullandıkları ilaçlar, ameliyatın aciliyet durumu ve türü, anestezi türü ve süresi, intraoperatif ve postoperatif komplikasyonlar ile yoğun bakım ünitesine çıkış şeklindeki bilgilere ulaşıldı.

Bulgular: Hastaların %82,6'sı 65-79 yaş aralığında, %17,4'ü ise 80 yaş ve üzeri grupta idi. 65-79 yaş grubunda hastaların %76,3'ü, 80 yaş ve üzerinin ise %50'si ASA II (American Society of Anesthesiologists Classification) idi. 80 yaş ve üzerinde kardiyovasküler sistem hastalığı eşlik etme durumu 2,11 kat (P=0,012), hipertansiyon 1,81 kat (P=0,05), nörolojik hastalık ise 2,42 kat (P=0,045) daha fazla idi. Hastaların antihipertansif ilaç kullanım oranı 80 yaş ve üzeri grupta 3,31 kat daha fazlaydı (P<0.001). Tüm vakaların %7,6'sı acil, %92,4'ü ise acil olmayan vakalardan oluşmaktaydı (P<0,001). Operasyon türleri açısından; 65-79 yaş grubunda ürolojik girişimler birinci sırada iken, 80 yaş ve üzeri grupta ortopedik cerrahi ilk sırada yer almakta idi (P=0,017). Cerrahi sonrası yoğun bakım ünitesine çıkma durumu 80 yaş ve üzerinde 3,31 kat fazla idi (P<0.001).

Sonuç: Geriatrik yaş grubunda ayrıntılı peroperatif değerlendirme ve optimal anestezi hazırlığı önemlidir, yandaş hastalığı olan veuzun sürebilecek vakalar gözönüne alınarak yoğun bakım yataklarının da ihtiyaca uygun biçimde planlanması gerekir.

Anahtar kelimeler: Geriatrik hasta, perioperatif değerlendirme, anestezi

Abstract

Aim: Anesthetic administration in geriatric patients is of great importance due to high mortality and morbidity. In this study we aim to assess and present our anesthetic administration and short-term results in the geriatric patient group.

Material and Methods: The files of 357 patients who underwent non-cardiac surgeries between January 2013 and December 2013 were retrospectively scanned. Information relating to demographic characteristics, ASA class, accompanying diseases, medications used, type of surgery and degree of urgency, type and duration of anesthesia, intraoperative and postoperative complications and entry to the intensive care unit was reached.

Results: Of patients 82.6% were between 65-79 years of age while 17.4% were 80 years and older. In the patients in the 65-79 year age group 76.3% and in the group 80 years and older 50% were ASA II (American Society of Anesthesiologists classification). In the group 80 years and older, accompanying cardiovascular system diseases were 2.11 times greater (P=0.012), hypertension was 1.81 times greater (P=0.05) and neurological diseases were 2.42 times greater (P=0.045). The use of antihypertensive medication was 3.31 times greater in the group aged 80 years and above (P<0.001). Of all cases, 7.6% were emergency and 92.4% were non-emergency cases (P<0.001). In terms of type of operation, in the 65-79 age group urological interventions were in first place, while in the group aged 80 years and above orthopedic surgery was first place (P=0.017). In both age groups spinal anesthesia was chosen most often (P=0.040). After surgery the entry into the intensive care unit was 3.31 times greater in the group aged 80 years and older (P<0.001).

Conclusion: Detailed peroperative assessment and optimal anesthesia preparation is important in the geriatric age group. It is necessary to plan requirements for beds in the intensive care unit taking account of those with accompanying diseases and cases that may require long stays.

Key words: Geriatric patient, peroperative evaluation, anesthesia.

Introduction

Related to the increase in life expectancies, more patients in the geriatric age group are encountering surgical and anesthetic risks (1). In this patient group, in addition to age, the incidence of accompanying diseases is increased, and nutritional disorders and organ dysfunction are frequently observed (2). Additionally, these patients are sensitive to respiratory, cardiovascular and mental changes (3). Positive postoperative results of patients with advanced age are closely related to the type of surgery, anesthetic method and postoperative care. Detailed evaluation before anesthesia is another important factor necessary for the safety of surgery and anesthetic administration in the geriatric patient group. In addition to appropriate anesthetic method, good postoperative care and analgesia planning are important steps to ensure good postoperative results. Again recovery from anesthesia is one of the most critical periods for elderly patients (3,4). Significant steps should be taken to create new care and treatment protocols with branches serving geriatric patients with

many accompanying diseases. The aim of our study is to assess the anesthetic administration and the short term results in the geriatric patient group, and create a clinical database of the patient potential in this group.

Material and Methods

The study obtained permission from the ethics committee (Medical Research Ethics Committee of Ordu University; 2015/07) and retrospectively scanned the files of 357 adult patients who underwent non-cardiac surgery between 01/01/2013 and 31/12/2013. Information relating to demographic characteristics, ASA class, accompanying diseases, medications used, urgency of surgery, type of surgery, type of anesthesia, duration of anesthesia, intraoperative cardiovascular complications, and postoperative cardiovascular and respiratory complications and entry to the intensive care unit (ICU) was reached. Cases with information missing from their files in terms of this data were excluded from the study.

Statistical Analysis; this study was designed as one-year time period.Normally distributed continuous data was expressed as sample size and mean values with standard deviation and analyzed by using two independent samples t test according to sex. Categorical data were expressed as sample size and proportions. Cross-tabulated data (contingency tables) were analyzed by Chi-Square tests or Fisher's exact test. The estimates of the association were expressed as odds ratios (OR). All data analyses were performed using the SPSS version 15.0. $P<0.05$ probability Values Were Considered As Significant.

Results

The distribution of patients in terms of age and gender is given in Table 1, while distribution in terms of ASA classification is given in Table 2. The rate of accompanying systemic diseases in groups are shown in Table 3. In those aged 80 years and older the rate of accompanying cardiovascular system diseases (CVS) was 2.11 times greater ($P=0.012$) and hypertension (HT) was 1.81 times greater ($P=0.050$). There was a change in the incidence of neurological diseases according to age; it was 2.42 times greater in patients 80 years and older ($P=0.045$). There was no significant change in the incidence of diabetes mellitus (DM) ($P=0.314$), chronic renal failure (CRF) ($P=0.083$), respiratory diseases ($P=0.925$) and goitre ($P=0.936$) in terms of age group. In two groups, the distribution of medications frequently used by patients are shown in Table 4 with anti-hypertensive medication use 3.31 times greater in patients above the age of 80 ($P<0.001$). There was no change identified with age for use of antidiabetic ($P=0.519$), anticoagulant ($P=0.158$) and respiratory system medications ($P=0.831$). When assessed in terms of type of operations, 7.6% of all cases were emergency and 92.4% were non-emergency cases ($P<0.01$) and the incidence of emergency surgery was 3.76 times greater in patients 80 years and older ($P=0.001$). The distribution of type of operation with age is given in Table 5 with urological interventions first place in the 65-79 year age group and orthopedic surgeries first place in the group aged 80 years and older ($P=0.017$). The anesthesia types administered to patients are listed in Table 6 with spinal anesthesia first place in both

age groups (*P*=0.040). There was no change in CVS complications in the intraoperative period (*P*=0.874) and CVS (*P*=0.663) and respiratory (*P*=0.529) complications observed in the recovery unit in the postoperative period according to age. After surgery the entry rates into the ICU were 9.5% in the 65-79 age group and 25.8% in the 80 years and older age group (*P*<0.001). The mean anesthesia duration in patients entering the ICU was 131.48±79.21 min, while for patients who did not enter the ICU this duration was 79.65±53.51 minutes and as the duration of anesthesia lengthened, the chances of entering ICU increased (*P*<0.001). While the probability of entering the ICU increased for patients with accompanying CVS (*P*=0.001), respiratory (*P*=0.001) and neurological diseases (*P*<0.011), this rate was not significant in those with HT (*P*=0.533), DM (*P*=0.276), CRF (*P*=0.451) and goitre (*P*=0.190).

Table 1. Distribution of patients according to gender and age.

Gender	Age Range	N	%	Mean	Std. Deviation
Male	65-79 years	206	86,6	71,33	4,49
	80 and older	32	13,4	81,43	3,26
	Total	238	100,0	72,69	5,55
Female	65-79 years	89	74,8	70,37	4,23
	80 and older	30	25,2	84,27	2,43
	Total	119	100	73,87	7,71
Total	65-79 years	295	82,6	71,04	4,43
	80 and older	62	17,4	82,80	3,20

Table 2. Distribution of patients accordingto ASA.

ASA*	65–79 years (n=295)		80 and older (n=62)		Total (n=357)		P- value
	n	%	N	(%)	n	(%)	
ASA I	14	4,7	0	0,0	14	3,9	< 0,001
ASA II	225	76,3	31	50,0	256	71,7	
ASA III	51	17,3	28	45,2	79	22,1	
ASA IV	5	1,7	3	4,8	8	2,2	

*: American Society of Anesthesiologists classification

Table 3. The rate of comorbiditiesaccording to age groups.

Comorbidities*	65 – 79 years (n=295)		80 and older (n=62)		Total (n=357)		*P*-value
	n	%	n	(%)	n	(%)	
CVS	61	20,7	22	35,5	83	23,2	0,012
HT	175	59,3	45	72,6	220	61,6	0,050
Neurological	17	5,8	8	12,9	25	7,0	0,045
DM	59	20,1	16	25,8	75	21,1	0,314
CRF	2	0,7	2	3,2	4	1,1	0,083
Respiratory	65	22,1	14	22,6	79	22,1	0,925
Goitre	15	5,1	3	4,8	18	5,0	0,936

***:** CVS: Cardiovascular system diseases
HT:Hypertension
DM:Diabetes mellitus
CRF: Chronic renal failure

Table 4. The rate of systemic medications according to age groups.

Medications	65 – 79 years (n=295)		80 and older (n=62)		Total (n=357)		P- value
	n	%	n	(%)	n	(%)	
Antihypertensive	150	50,8	48	77,4	198	55,5	0,001
Antidiabetic	65	22	16	25,8	81	22,7	0,519
Anticoagulant	41	13,9	13	21	54	15,1	0,158
Respiratory	63	21,4	14	22,6	77	21,6	0,831

Table 5. Distribution of patients according to operation types.

Operation types	65–79 years (n=295)		80 and older (n=62)		Total (n=357)		*P*-value
	n	%	n	(%)	N	(%)	
General Surgery	64	21,7	11	17,7	75	21,0	
Minor Surgery	12	4,1	1	1,6	13	3,6	
Urology	119	40,3	22	35,5	141	39,5	
Orthopedics	50	16,9	23	37,1	73	20,4	0,017
Neurosurgery	18	6,1	3	4,8	21	5,9	
Eye Surgery	13	4,4	2	3,2	15	4,2	
Head and Neck	19	6,4	0	0,0	19	5,3	

Table 6. Distribution of anesthesia types according to age groups.

Anesthesia	65–79 years (n=295)		80 and older (n=62)		Total (n=357)		P- value
	n	%	n	(%)	n	(%)	
General	126	42,7	22	35,5	148	41,5	
Spinal	151	51,2	31	50	182	51	0,040
Sedoanalgesia	15	5,1	5	8,1	20	5,6	
CSE*	3	1,0	4	6,5	7	2,0	

*: Combined spinal-epidural anesthesia

Discussion

Aging is a natural process and during this process progressive atrophy of organs and tissues, fibrosis and loss of elasticity occur. Structural and functional changes develop in many organs. Currently individuals above the age of 65 are accepted as elderly and the elderly are different to youth in physiological, pharmacological and psychological ways (1,4). It is estimated that in 2050, 30% of the population with comprise individuals above the age of 65. These individuals may require up to four times greater rates of surgery in the remaining years of life (5). In our research, in the geriatric patient group we investigated 82.6% were in the 65-79 year age interval with 17.4% aged 80 years or older. The incidence of emergency surgery was identified to be greater in patients 80 years and older. In the geriatric age group both

surgery and anesthesia applications change linked to age. The high postoperative mortality and morbidity is closely related to accompanying cardiovascular diseases, cerebrovascular diseases, renal dysfunction and respiratory diseases. The preoperative evaluation of geriatric patients should be completed with great care (4,6). In a study of mortality related to anesthesia, Li et al. reported that the mortality linked to anesthesia was higher from the age of 75 onward (7). The patient's functional capacity should be evaluated well, especially related to cardiovascular diseases. While the risk related to anesthesia in elderly patients increases with ASA risk, postoperative results are affected by many factors including type of surgery, anesthetic method and postoperative care (5,8). Brunt et al. in a study of elderly and very elderly patients undergoing laparoscopic cholecystectomy reported a higher ASA classification in the group aged 80 years and older (9). In our patients when we examine the ASA classification, while ASA II was observed at a rate of 76.3% in the 65-79 age group the rate of ASA II in the group aged 80 years and older reduced. However, the ASA III rate increased in this group. The appropriate anesthetic method in terms of mortality and results in elderly patients is still a controversial topic. Peroperative risk factors should be carefully determined and postoperative rehabilitation must be included in this evaluation (8). In the elderly population cardiac conduction defects, HT and DM are frequent and changes in fluid balance are not tolerated well (10,11). In our patients, when accompanying systemic diseases are investigated, in those 80 years and older the CVS disease rate was 2.11 times greater, and the incidence of HT was 1.81 times greater. Advanced age and accompanying pulmonary complications are among the significant causes increasing postoperative morbidity (11,12). COPD, pneumonia and sleep apnea are more common in the elderly population, postoperative respiratory complications are encountered more frequently and transfer to the ICU in the postoperative period is frequently recommended for this group of patients (10). In our patients when the incidence of respiratory diseases is examined, there was no significant difference found between the 65-79 year age group and 80 years and older group. When other accompanying diseases are assessed, while there was no change in DM and goitre incidence with age, the incidence of neurological disease in those 80 years and older was 2.42 times greater. While there was no statistically significant difference in the incidence of CRF in both age groups, it must be remembered that in elderly patients there may be a reduction in renal blood flow and postoperative renal failure may develop. Additionally these patients are susceptible in terms of the central nervous system, the requirements for local and general anesthetic doses reduces, rousing from general anesthesia may be delayed and in the postoperative period varying degrees of delirium may be encountered (10). Just as the physiological reserves of elderly patients should be known on preanesthetic evaluation, depression, malnutrition, dehydration and immobilization situations must be considered. Cognitive dysfunction is closely related to high perioperative morbidity and poor outcomes. Advanced age may affect choice of anesthesia, however it does not form a contraindication for general or regional anesthesia (1,10). In terms of type of surgery of our patients, urological interventions were first in the 65-70 year age group while orthopedic surgery was first in

the 80 years and older age group (P=0.017). Of all cases participating in the research 7.6% were emergency cases and the incidence of emergency surgery was greater in the 80 years and older age group. In research by Brunt et al., they reported that the necessity for emergency surgery was greater in the 80 years and older age group compared to the 65-79 year age group[9]. When differences in anesthetic type according to age were assessed in our patients, spinal anesthesia was observed to be in first place in both age groups. Regional anesthesia may be chosen in appropriate cases for reasons such as reduction in pulmonary complications, fewer effects on hemodynamic changes, deep vein thrombosis prophylaxis and not endangering airway reliability, however anatomic difficulties, increased toxicity of local anesthetics and susceptibility to physiological effects of block may affect the choice of regional anesthesia (10,14). In a study assessing the effects of peripheral nerve block and general anesthesia on mortality and postoperative complication in cases with femur fracture, it was reported that both anesthetic methods had similar effects on these complications (13). Luger et al. in a meta-analysis of hip fracture surgery found that general anesthesia had advantages such as less hypotension, less cerebrovascular damage and reduced duration of surgery, however in terms of respiratory diseases morbidity increased. Again the same research found regional anesthesia causes fewer respiratory and cardiac complications and reported that incidence of early mortality was lower (8). The titration of dose of general anesthetic medications is a very important topic. Elderly patients use more than one medication for chronic diseases and the variety and high doses of these medications used by patients for different clinical diagnoses may create adverse effects during anesthesia administration (15,16). Increased susceptibility to peroperative hypoglycemia, and renal and hepatic functions may be affected by the metabolism and clearance of medications (17). In our research the rate of use of antihypertensive medication in our patient group changed depending on age and the group aged 80 years and older used more of these medications. The use of antidiabetic, anticoagulant and respiratory system medications did not change with age. In elderly patients the metabolism, distribution and clearance of anesthetic medications may be affected. Patients are more sensitive to the central depressive effects of anesthetics and reducing the dose of anesthetic medications becomes important (17). Among the most common causes of postoperative morbidity are atalectasis, heart failure, pneumonia, delirium and myocardial infarctus. Good preoperative assessment of elderly patients, appropriate anesthetic management and postoperative pain control have an important place in anesthetic administration (10,11). Though elderly patients may have chronic health problems, they tolerate non-cardiac surgery well (18). However in the postoperative period they are more susceptible, especially to cardiovascular and respiratory complications. This situation is a significant factor in increasing duration of hospital stay and mortality (19). When the cardiovascular complications in the intraoperative period and the respiratory and cardiovascular complications in the postoperative period are examined in our patients, there was no significant difference found between the age groups. The accompanying respiratory diseases and postoperative respiratory complications in this age group are important indications for

entry to the ICU after surgery (10). ICU entry due to ventilator use increases the duration of hospitalization and as a result, hospital costs (20). The entry rates into ICU for our patients after surgery were different according to age, with the probability of entering ICU higher for those aged 80 years and older. The mean anesthesia duration of patients who entered the ICU was higher than for those who did not enter the ICU and as the duration of anesthesia increased the probability of entering the ICU increased. At the same time the entry into the ICU in the postoperative period of patients with accompanying CVS, respiratory and neurological diseases was found to be higher than patients without these accompanying diseases. There was no difference for patients with diagnoses of accompanying HT, DM, CRF and goitre. Providing effective organization of ICU beds for this type of patient group is very important for effective postoperative care.

Good preoperative assessment, optimal preparation before surgery for elective cases and appropriate anesthetic choice for emergency cases will allow the peroperative period to pass without incident and the effective and productive use of ICU beds. This research has a number of limitations such as being carried out in a single center with relatively low patient numbers, lack of determination of nutritional profiles of patients in the preoperative period and only obtaining early postoperative results. We believe that multi-center studies with detailed preoperative assessment results and investigation of long-term results will provide a beneficial database.

Better medical treatment and care approaches have increased the numbers of geriatric patients through the years and it is clear that each day increasing numbers from this age group require surgical interventions. Detailed preoperative evaluation and optimum preparation is very important in this patient group. The greater complications in elderly patients brings about increases in hospital costs for reasons such as long hospital stays, and requiring treatment and care from more than one department. As a result, elderly patients should be assessed and treated with multidisciplinary approaches. Additionally hospitals should be supported to provide separate assessment of elderly patients and in creation of treatment protocols.

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References

1. Öztürk L, Erkılıç E, Dal H, Gümüş T, Kanbak O. Altmış Beş Yaş ve Üzeri Ameliyat Olan Hastalarda Cerrahi Bölüm ve Anestezi Yöntemlerinin İncelenmesi.Akad Geriatri. 2010;2:40-4.
2. Uğur M, Benzin F, Tozlu G, Koca YS, Çetin R. Geriatrik hastalarda acil ve elektif şartlarda yapılan inguinal herni onarımı sonuçlarının karşılaştırılması. Ulusal Cerrahi Dergisi. 2012;28:193-6.
3. Hancı V, Pişkin Ö. Geriatrik Anestezide Derlenme ve Postoperatif Bakım. Türkiye Klinikleri J Anest Reanim-Special Topics. 2011;4:52-9.
4. Türkmen A, Turgut N. Geriatrik Anestezi. Turkish Journal of Geriatrics. 2007;10:49-56.
5. Bettelli G. Anaesthesia for the elderly outpatient: preoperative assessment and

evaluation, anaesthetic technique and postoperative pain management. Curr Opin Anaesthesiol. 2010;23:726-31.
6. Kim KI, Park KH, Koo KH, Han HS, Kim CH. Comprehensive geriatric assessment can predict postoperative morbidity and mortality in elderly patients undergoing elective surgery. Arch Gerontol Geriatr. 2013;56:507-12.
7. Li G, Warner M, Lang BH, Huang L, Sun LS. Epidemiology of anesthesia-related mortality in the United States, 1999-2005. Anesthesiology. 2009; 110: 759-65.
8. Luger TJ, Kammerlander C, Luger MF,Kammerlander-Knauer U, Gosch M. Mode of anesthesia, mortality and outcome in geriatric patients. Z Gerontol Geriatr. 2014;47:110-24.
9. Brunt LM, Quasebarth MA, Dunnegan DL, Soper NJ.ÜOutcomes analysis of laparoscopic cholecystectomy in the extremely elderly. Surg Endosc. 2001;15:700-5.
10. Kanonidou Z, Karystianou G. Anesthesia for the elderly. Hippokratia. 2007;11:175-7.
11. Karslı B, Kafalı İH, Mimaroğlu C, Özok U. Geriatrik Anestezi. T Klin Tıp Bilimleri. 1994;14:309-13.
12. Oğurlu M, Şen S, Uğur B, Dişcigil G, Aydın ON, Gürsoy F. 65 yaş üstü hastalarda spinal anesteziye bağlı hipotansiyon gelişiminin değerlendirilmesi. Turkish Journal of Geriatrics. 2006;9:126-9.
13. Liu JL, Wang XL, Gong MW, Mai HX, Pei SJ, Yuan WX et al. Comparative outcomes of peripheral nerve blocks versus general anesthesia for hip fractures in geriatric Chinese patients. Patient preference and Adherence. 2014;8:651-9.
14. Lisa Kunze. Issues in Geriatric Orthopedic Anesthesia. Int Anesthesiol Clin. 2014; 52:126-39.
15. Hartmann S, Barnett S. Geriatric Consultation. Int Anesthesiol Clin. 2014;52:14-25.
16. Hilmer SN, McLachlan AJ, Le Couteur DG. Clinical pharmacology in the geriatric patient. Fundam Clin Pharmacol. 2007;21:217-30.
17. Aurini L, White PF. Anesthesia for the elderly outpatient. Curr Opin Anaesthesiol. 2014;27:563-75.
18. Leung JM, Dzankic S. Relative importance of preoperative health status versus intraoperative factors in predicting postoperative adverse outcomes in geriatric surgical patients. J Am Geriatr Soc. 2001;49:1080-5.
19. Chung JY, Chang WY, Lin TW, Lu JR, Yang MW, Lin CC et al. An analysis of surgical outcomes in patients aged 80 years and older. Acta Anaesthesiol Taiwan. 2014;52:153-8.
20. Le-Wendling L, Bihorac A, Baslanti TO, Lucas S, Sadasivan K, Wendling A et al. Regional anesthesia as compared with general anesthesia for surgery in geriatric patients with hip fracture: does it decrease morbidity, mortality, and health care costs? Results of a single-centered study. Pain Med. 2012;13:948-56.