



Comparison of the effects of general and regional anesthesia on postoperative quality of life in elderly patients after transurethral prostate resection

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Abstract

Comparison of the effects of general and regional anesthesia on postoperative quality of life in elderly patients after transurethral prostate resection

Objective: In our study, it was investigated whether the anesthesia method applied to patients with lower urinary tract symptoms due to benign prostatic hypertrophy and who will undergo transurethral resection of the prostate has effects on postoperative quality of life.

Method: A total of 60 patients scheduled for TUR-P were included in the study. The patients were divided into two groups as those receiving spinal anesthesia and those receiving general anesthesia. We recorded demographic data and preoperative and perioperative parameters. We evaluated the postoperative quality of life and satisfaction of the patients using the Short Form-36 scale.

Results: There was no statistically significant difference between the two groups in terms of demographic data and hemodynamic changes. There was a higher rate of patients who consumed alcohol and smoked in the general anesthesia group ($p<0.05$). The perioperative hemodynamic findings of the patients were similar in both groups ($p>0.05$). The preoperative and postoperative SF-36 subdomain scores were compared within the spinal anesthesia group, there was a statistically significant difference in all parameters ($p<0.001$). The preoperative and postoperative SF-36 subdomain scores were compared within the general anesthesia group, statistically significant differences were observed in vitality, mental health, and social functioning ($p<0.05$). There was no statistically significant difference between the preoperative SF-36 subdomain scores of the spinal and general anesthesia group ($p>0.05$). In the spinal anesthesia group, the postoperative first month scores were statistically significantly higher in the sub-areas, except for the vitality scores, compared to the general anesthesia group ($p<0.05$).

Conclusion: It is important to ensure that geriatric patients return to their daily life activities in the early period after TUR-P. According to our results, spinal anesthesia was found to be superior to general anesthesia in terms of the quality of life of the patients.

Keywords: Anesthesia, Prostate, Quality of Life, Transurethral Resection

Öz

Transüretal prostat rezeksiyonu olan yaşlı hastalarda genel ve rejyonel anestezi uygulamalarının ameliyat sonrası yaşam kalitesine etkilerinin karşılaştırılması

Amaç: Çalışmamızda benign prostat hipertrofisi nedeniyle alt üriner sistem semptomları olan ve transüretal prostat rezeksiyonu uygulanacak hastalara uygulanan anestezi yönteminin postoperatif yaşam kalitesi üzerinde etkisinin olup olmadığı araştırıldı.

Yöntem: Çalışmaya transüretal prostat rezeksiyonu planlanan 60 hasta dahil edildi. 1. gruba spinal anestezi, 2. gruba genel anestezi uygulandı. Demografik veriler, preoperatif ve perioperatif parametreler kaydedildi. Postoperatif yaşam kalitesi ve hasta memnuniyeti Kısa form-36 (SF-36) kullanılarak değerlendirildi.

Bulgular: Demografik veriler ve hemodinamik değişiklikler açısından gruplar arasında fark yoktu. Alkol ve sigara kullananların sigara içmeyenlere göre genel anestezi tercihi daha yüksekti ($p<0.05$). Hastaların perioperatif hemodinamik bulguları her iki grupta benzerdi ($p>0.005$). Spinal anestezi grubunda preoperatif ve postoperatif SF-36 alt alan skorları karşılaştırıldığında, tüm parametrelerde istatistiksel olarak anlamlı fark vardı ($p<0.001$). Ameliyat öncesi ve sonrası SF-36 alt alan skorları genel anestezi grubu içinde karşılaştırıldığında, vitalite, mental sağlık ve sosyal işlevsellik açısından istatistiksel olarak anlamlı farklılıklar gözlemlendi ($p<0.05$). Spinal ve genel anestezi grubunun ameliyat öncesi SF-36 alt alan puanları arasında istatistiksel olarak anlamlı fark yoktu ($p>0.05$). Spinal anestezi grubunda postoperatif birinci ay skorları genel anestezi grubuna göre vitalite skorları dışında alt alanlarda istatistiksel olarak anlamlı derecede yüksekti ($p<0.05$).

Sonuç: Geriatrik hasta popülasyonunda yapılan TUR-P ameliyatında anestezi sonrası erken yaşama katılmanın önemi yüksektir. Çalışmamız, hasta yaşam kalitesi ve hasta memnuniyeti açısından spinal anestezinin genel anesteziden üstün olduğunu destekledi.

Anahtar Kelimeler: Anestezi, Prostat, Yaşam Kalitesi, Transüretal Rezeksiyon

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INTRODUCTION

Benign prostatic hyperplasia (BPH) is the leading cause of urinary tract symptoms in aging men. While the prevalence rate of symptomatic BPH in men aged 45-49 years is 2.7%, this rate increases to 24% at the age of 80 (1). Transurethral resection of the prostate (TUR-P) has become the gold standard in the surgical treatment of patients who have developed acute urinary retention due to BPH (2, 3). Geriatric anesthesia has become an entire field in modern anesthesia practice and perioperative care. Anesthesia in elderly patients requires a special approach with consideration of aging-related physiological and psychological changes. During the preoperative evaluation of geriatric cases, patients should be addressed formally, those with visual and auditory losses should be allocated more time and attention in terms of their needs, patients should be well informed about the anesthesia application and what they should expect in the perioperative period, and they should be given the opportunity to choose the premedication and anesthesia method. In order for the aging population to lead an active life without disability, it is necessary to determine risk factors that reduce their quality of life and associated functional losses. In a study examining the quality of life of elderly individuals, it was observed that reasons such as educational status, marital status, occupational characteristics, concomitant diseases, the presence of many regularly used drugs and the gradual deterioration of cognitive functions lead to many negativities in old age. This situation affects the implementation and treatment of health services and causes a decrease in the quality of life of the individual. In order for the aging population to lead an active life without disability, it is necessary to determine risk factors that reduce their quality of life and associated functional losses. Therefore, a better understanding of preoperative and postoperative anesthesia problems in elderly patients may help improve patient satisfaction and quality of life in the postoperative period (4, 5).

The Short Form-36 (SF-36) is a scale developed by Ware in 1987 to examine the health status and quality of life of individuals (6). This scale measures the quality of life in different functional areas and is available in many cultures and languages, including Turkish, and the validity and reliability of the Turkish version have been confirmed (7). The scale is completed by the patient over approximately 10-15 minutes.

This study aimed to compare the effects of general and regional anesthesia applications on postoperative quality of life and patient satisfaction using the SF-36 scale in elderly patients who were scheduled for TUR-P.

METHOD

Sixty patients aged 60-80 years who were scheduled for TUR-P between June 2019 and September 2019 were included in the study. Patients under 60 and over 80 years, those with malignancy or suspected malignancy, those with psychiatric problems, those with chronic pain problems, those with a history of cerebrovascular disease or bleeding diathesis, and those in the risk class of IV or above according to the American Society of Anesthesiologists (ASA) risk classification were excluded from the study.

Depending on their anesthesia preference, the patients were divided into two groups as spinal anesthesia and general anesthesia. All patients were informed about the procedure and possible complications, and their consent was obtained for both anesthesia and participation in the study. Age, body weight, marital status, employment status, comorbidities, smoking and alcohol use, duration of operation, duration of anesthesia, hemodynamic parameters during anesthesia (mean arterial pressure, heart rate, and oxygen saturation), where the patients were followed up in the postoperative period (ward/intensive care unit), and length of hospital stay were recorded for all the patients. The SF-36 scale was completed by the patients during the preoperative evaluation and the face-to-face interview at the postoperative first month to assess their quality of life. The Short Form-36 (SF-36) is a scale developed by Ware in 1987 to examine the health status and quality of life of individuals (6). This scale measures the quality of life in different functional areas and is available in many languages (7). The scale consists of 36 items presented under two main domains (physical and mental health) covering eight concepts (physical functioning, role-physical health problems, bodily pain, social functioning, overall mental health including psychological distress, role-emotional problems, vitality, and general health perception). Positive scoring is used, and the scores of range from 0 to 100.

Statistical Analysis

A preliminary study was performed in ten patients from each group in our clinic. The mean \pm standard

deviation postoperative general health perception was 80.00 ± 10.5 in the spinal anesthesia group and 70.00 ± 11.5 in the general anesthesia group. The sample size was calculated at a power of 93% and a significance level of 5% by using the G*Power software (version 3.1.9.4, Kiel University, Kiel, Germany), and it was determined that effect size was 0.90 and it would be necessary to have approximately 30 patients per group to obtain significant statistical value.

Statistical analysis was performed using the statistical package IBM SPSS v. 22.0 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) When performing SF-36 scoring, Microsoft Office Excel 2016 was utilized, and then the score calculations of the eight sub-domains of the scale were transferred to the SPSS system. Descriptive statistics were shown with mean and standard deviation values for normally distributed quantitative data and with median, minimum and maximum values for the data that were not normally distributed, while frequency and percentage values were used for qualitative data. Continuous variables were analyzed using Student's t-test, and the Mann-Whitney U test was used for the data that did not show a normal distribution. The conformity of the variables to a normal distribution was analyzed with the Kolmogorov-Smirnov and histogram tests. Data obtained before and after the evaluation in the group that did not comply with a normal distribution were analyzed using the Wilcoxon signed-rank test. The Pearson chi-square test and Fisher's exact chi-square test were conducted in the analysis of categorical data. The significance level was selected as $\alpha = 0.05$.

RESULTS

The demographic data of the patients are given in Table 1. There was no significant difference between the spinal anesthesia and general anesthesia groups in terms of age, duration of operation, and duration of anesthesia, body weight, presence of comorbidities, and length of hospital stay ($p=0.641$, $p=0.444$, $p=0.557$, $p=0.748$, and $p=0.497$, respectively). However, smoking and/or alcohol use was significantly higher in the general anesthesia group than in the spinal anesthesia group ($p=0.005$). There was no significant difference between the two groups in relation to hemodynamic follow-up parameters, namely intraoperative mean heart rate, mean arterial pressure, and oxygen saturation ($p>0.05$) (Table 2).

Table 1: Demographic data

		Spinal anesthesia (n=30)		General anesthesia (n=30)		p
Age (years)		67.43 ± 8.04		68.40 ± 7.92		0.641 ^α
Weight (kg)		82.57 ± 10.72		79.90 ± 11.03		0.444 ^α
Duration of operation (min)		38.50 ± 16.03		36.17 ± 0.65		0.557 ^α
Duration of anesthesia (min)		43.17 ± 16.99		41.83 ± 16.42		0.758 ^α
Length of hospital stay (days)		1.13 ± 0.34		1.20 ± 0.40		0.497 ^α
		n	%	n	%	
Marital status	Single	3	10	3	10	1.000 ^α
	Married	27	90	27	90	
Comorbidity	None	13	43.33	18	60	0.784 ^β
	CAD	1	3.33	1	3.33	
	HT	10	33.33	7	23.33	
	COPD	3	10	2	6.66	
	DM	3	10	2	6.66	
Smoking or alcohol consumption	Absent	30	100	22	66.66	0.005 ^γ
	Present	0	0	8	33.33	

Values given as mean ± standard deviation or number
kg; kilogram, CAD; Coronary artery disease, HT; Hypertension, COPD; Chronic obstructive pulmonary disease, DM; Diabetes mellitus

When the preoperative and postoperative SF-36 subdomain scores were compared within the spinal anesthesia group, there was a statistically significant difference in all parameters (physical functioning, $p<0.001$; role-physical, $p=0.001$; role-emotional, $p<0.001$; vitality, $p<0.001$; mental health, $p<0.001$; social functioning, $p<0.001$; bodily pain, $p<0.001$; and general health perception, $p<0.001$) (Table 3). When the preoperative and postoperative SF-36 subdomain scores were compared within the general anesthesia group, statistically significant differences were observed in vitality ($p=0.006$), mental health ($p=0.002$), and social functioning ($p=0.007$) (Table 4).

There was no statistically significant difference between the preoperative SF-36 subdomain scores of the spinal and general anesthesia group ($p>0.05$ for all) (Table 5). Additionally, in the postoperative first-month scores, the physical functioning ($p<0.001$), role-physical ($p=0.004$), role-emotional ($p=0.003$), mental health ($p=0.025$), social functioning ($p=0.037$), bodily pain ($p=0.003$) and general health perception ($p=0.002$) subdomains were

Table 2: Comparison of hemodynamic parameters between the spinal and general anesthesia groups

	Spinal anesthesia (n=30)	General anesthesia (n=30)	p
BP at min 0 (mmHg)	99.33 ± 12.12	103.97 ± 12.24	0.146
BP at min 5 (mmHg)	96.20 ± 15.5	100.27 ± 14.48	0.298
BP at min 10 (mmHg)	95.43 ± 14.21	99.33 ± 11.18	0.242
BP at min 15 (mmHg)	92.37 ± 12.74	97.97 ± 12.34	0.089
BP at min 30 (mmHg)	92.93 ± 13.95	98.47 ± 14.04	0.131
BP at min 45 (mmHg)	92.50 ± 13.78	96.97 ± 11.83	0.183
BP at min 60 (mmHg)	91.83 ± 13.6	96.13 ± 12.94	0.215
CAB at min 0 (/min)	77.63 ± 14.88	80.73 ± 18.8	0.482
CAB at min 5 (/min)	75.07 ± 14.03	80.97 ± 17.92	0.161
CAB at min 10 (/min)	72.37 ± 11.51	79.13 ± 17.33	0.080
CAB at min 15 (/min)	71.57 ± 12.18	75.87 ± 17.21	0.269
CAB at min 30 (/min)	68.70 ± 11.73	74.8 ± 15.84	0.095
CAB at min 45 (/min)	67.37 ± 11.4	73.23 ± 15.2	0.096
SO ₂ at min 0 (%)	98.03 ± 1.45	97.50 ± 2.31	0.055
SO ₂ at min 5 (%)	97.73 ± 1.79	97.97 ± 1.58	0.289
SO ₂ at min 10 (%)	98.07 ± 1.46	97.80 ± 1.29	0.596
SO ₂ at min 15 (%)	98.10 ± 1.95	97.75 ± 1.73	0.780
SO ₂ at min 30 (%)	98.63 ± 1.27	98.47 ± 1.10	0.781
SO ₂ at min 45 (%)	98.53 ± 1.35	98.83 ± 0.59	0.590
SO ₂ at min 60 (%)	98.90 ± 0.48	98.87 ± 0.57	0.272

Values given as mean ± standard deviation or number, p>0.05 Student's t-test. BP; Blood pressure, CAB; Cardiac apex beat, SO₂; Saturation

statistically significantly higher in the spinal anesthesia group compared to the general anesthesia group. There was no significant difference between the two groups in terms of the vitality scores (p=0.066) (Table 6).

DISCUSSION

In this study, we found that spinal anesthesia had a lower negative effect on quality-of-life compared to general anesthesia in geriatric patients who underwent TUR-P.

BPH causes the symptomatic obstruction of the bladder neck in men over 60 years of age. It is the most common benign tumor of the prostate (8). As a less invasive method, TUR-P is considered as the gold standard surgical treatment option (9). This surgical intervention is performed under general or regional

Table 3: Comparison of the preoperative and postoperative quality of life scores in the spinal anesthesia group

	Preoperative (n=30)	Median [25%-75%]	Postoperative (n=30)	Median [25%-75%]	p
Physical functioning	45	35-60	73	55-95	<0.001*
Role-physical	25	0-56	50	50-100	<0.001*
Role-emotional	33	0-100	100	67-100	<0.001*
Vitality	45	40-60	73	60-80	<0.001*
Mental health	52	44-57	68	60-84	<0.001*
Social functioning	38	25-53	75	50-87	<0.001*
Bodily pain	55	40-65	77	65-87	<0.001*
General health perception	53	45-60	70	65-90	<0.001*

*p<0.05 Wilcoxon's signed-rank test

anesthesia, and the superiority of these two techniques over each other remains controversial (10). Anesthesia management and its complications may raise questions and result in anxiety in patients. Anesthesia-related fears have been basically described as not being able to wake up from anesthesia, inexperience of the anesthesiologist, and feeling pain during surgery (11). Patients' first questions concerning anesthesia include whether they will experience pain after surgery and when they will be able to walk and eat after anesthesia (12). It is a specific pathological condition accompanied by a feeling of fear and somatic symptoms related to the hyperactivity of the autonomic nervous system. The incidence of anxiety symptoms in patients treated in hospital for any reason is reported to be 10-30% (11). Preoperative anxiety is seen at a rate of 60-80% in patients who have been scheduled for a surgical intervention, which adversely affects surgery, anesthesia, and postoperative recovery (13, 14).

Spinal anesthesia is the most preferred regional anesthesia method in surgical procedures below the umbilical level, especially in the elderly patient population (15). Compared to general anesthesia, spinal anesthesia is associated with less postoperative analgesic requirement and lower complication rates (16). In a randomized controlled study conducted by Luger et al., a total of 18,715 elderly patients who underwent total hip replacement were evaluated, and spinal anesthesia was found to be safer than general anesthesia in terms of

Table 4: Comparison of the preoperative and postoperative quality of life scores in the general anesthesia group

	Preoperative (n=30)	Median [25%-75%]	Postoperative (n=30)	Median [25%-75%]	p
Physical functioning	55	45-60	50	35-60	0.450
Role-physical	25	0-25	38	0-100	0.090
Role-emotional	33	0-67	67	0-100	0.173
Vitality	50	35-55	60	50-70	0.006*
Mental health	42	36-52	56	52-72	0.002*
Social functioning	38	25-50	62	37-75	0.007*
Bodily pain	58	45-77	67	55-77	0.475
General health perception	50	45-65	55	45-75	0.530

*p<0.05 Wilcoxon's signed-rank test

Table 5: Comparison of the preoperative quality of life scores between the spinal and general anesthesia groups

	Spinal anesthesia preoperative (n=30)	Median [25%-75%]	General anesthesia preoperative (n=30)	Median [25%-75%]	p
Physical functioning	45	35-60	55	45-60	0.098
Role-physical	25	0-50	25	0-25	0.277
Role-emotional	33	0-100	33	0-67	0.963
Vitality	45	40-60	50	35-55	0.795
Mental health	52	44-56	42	36-52	0.061
Social functioning	38	25-50	38	25-50	0.586
Bodily pain	55	43-65	58	45-78	0.204
General health perception	53	45-60	50	45-65	0.952

p>0.05 Mann-Whitney U test

Table 6: Comparison of the postoperative 1st month quality of life scores between the spinal and general anesthesia groups

	Spinal anesthesia postoperative (n=30)	Median [25%-75%]	General anesthesia postoperative (n=30)	Median [25%-75%]	p
Physical functioning	73	55-95	50	35-60	<0.001*
Role-physical	50	50-100	38	0-100	0.006*
Role-emotional	100	67-100	67	0-100	0.013*
Vitality	73	60-80	60	50-70	0.066
Mental health	68	60-84	56	52-72	0.013*
Social functioning	75	50-87	62	37-75	0.046*
Bodily pain	77	65-87	67	55-77	0.019*
General health perception	70	65-90	55	45-75	0.002*

*p > 0.05 Mann-Whitney U test

the general anesthesia group, physical functioning, role-physical, bodily pain, and general health perception scores did not show significant improvement. This is a possible anti-inflammatory mechanism after regional anesthesia blocked c-fibers, decreased cytokine production, and sympathetic nerve activity blockade, which limit the inflammatory response after surgery (20, 21). Cytokines also play an important role in the development of postoperative hyperalgesia (22). Anti-inflammatory effects, less postoperative pain, and faster postoperative recovery in regional anesthesia seem to have a greater impact on the improvement of the postoperative quality of life of patients.

Patients' quality of life change is a complex phenomenon that includes perioperative anesthesia management and satisfaction with the surgical procedure. It has been shown that the use of a multi-item scale is superior to a single evaluation (23). In the literature, there is still no consensus on the relationship between age and anxiety. While Shevde et al. argued that the level of anxiety was lower in elderly patients (24), Ramsey reported that anxiety was higher in the middle-aged group (25). In contrast, Aykent et al. reported that anxiety was higher in the group below the age of 30 years, which was attributed to young patients having easier access to information about complications

mortality and morbidity (17). Early study demonstrated that patients' quality of life that was assessed with SF-36 improved after operation. There was no difference between spinal and general anesthesia (18). Additionally, in a study by Bükür et al., the quality of life of patients who underwent TUR-P surgery was evaluated using SF-36, and positive changes were determined in all the subdomains of this scale in the postoperative period (19). Similar to the literature, our study showed that all the SF-36 subdomain scores significantly improved after surgery regardless anesthesia technique. In contrast, in

in the field of health and the belief in fate being higher in elderly patients compared to younger patients (26). There are also publications reporting no relationship between age and anxiety (27). We used the SF-36 scale to assess patient quality of life and determined that subdomains of SF-36 are improved more in spinal anesthesia group. When vitality was evaluated, there was no significant difference between the two groups. We consider that the age range of our patients and the existing advantages of spinal anesthesia, together with a postoperative increase in quality of life contributed to this result.

Studies have reported that patients have certain misconceptions concerning general and regional anesthesia, and concerns about rare complications are common (28, 29). Concerns about general anesthesia include not being able to wake up from anesthesia, brain damage, memory loss, and death, while those related to regional anesthesia are permanent paralysis, injury to the back, and having to watch the procedure. It has been emphasized that the hesitance of patients to undergo regional anesthesia is related to their lack of knowledge in this area, and therefore it is important to inform them well about both anesthesia options (28, 29). There are also publications reporting that informing patients about regional anesthesia increases their satisfaction (30).

Our study has certain limitations. First, it was conducted in a single center with a limited number of patients. Second, the patients were followed up for a short term. Third, postoperative pain was not evaluated with any scale. However, the prospective design and examination of patients' postoperative satisfaction and quality of life are among the strengths of our study.

CONCLUSION

It is very important for geriatric patients to be able to return to performing daily life activities in the early period after anesthesia applied during TUR-P. A positive anesthesia experience increases postoperative quality of life and reduces possible subsequent surgical interventions. The type of anesthesia can determine whether this experience is positive, and our results indicate that spinal anesthesia is superior to general anesthesia in terms of patient quality of life.

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Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article..

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Ethical Declaration

Permission was obtained from the Clinical Research Ethics Committee at the Mersin University (10.07.2019-2019/296) for this study, and Helsinki Declaration rules were followed to conduct this study.

Authorship Contributions

Concept: SGU, FG, SK, Design: SGU, FG, SK, Supervising: SGU, FG, SK, Financing and equipment: SGU, FG, SK, İHT, Data collection and entry: SGU, FG, SK, İHT, Analysis and interpretation: SGU, FG, SK, İHT, Literature search: SGU, FG, SK, İHT, Writing: SGU, FG, SK, Critical review: SGU, FG, SK, İHT

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