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RESEARCH

ONE-YEAR RETROSPECTIVE EVALUATION OF HIP FRACTURE PATIENTS AGED MORE THAN 80 YEARS AND POSTOPERATIVELY MONITORED IN THE INTENSIVE CARE UNIT

ABSTRACT

Introduction: As in all the world, expected life time has extended in our country as well which increases yearly operated elderly patient rate. Surgical intervention for hip fracture is one of the most common operations among them

Materials and Method: This study was done between 2014 and 2015 at Karabük Education and Research Hospital ICU. Who were older than age of 80, operated for hip surgery and monitored at ICU postoperatively included to study.

Results: The mean age of our patients was 84.65±3.36 years, and 50 of them were female (69.44%). 40 patients showed trochanteric femur fracture and 32 showed femoral neck fracture. Proximal femoral nail was implanted in 38 patients and partial hip prosthesis in 34. Regional anesthesia was administered to 57 patients and general anesthesia to 15. The hospital mortality rate was 16.6%. When we grouped the patients as surviving (60) or died (12), we found that the time before surgery was significantly longer for the died patients than for the surviving ones. The need for MV, duration of MV, and the need for inotropic agents were higher in died patients. The duration of ICU follow-up and hospital stay were longer for died patients. Other parameters showed no significant differences.

Conclusion: In our study, mental status of our patients and post-discharge conditions could not be evaluated. Not describing the cause of delay to the surgery and not recording patient satisfaction was other limitations. Therefore, we have decided to form a new research protocol for evaluating patient satisfaction and causes of delay to the surgery.

Keywords: Aged; Hip fractures; Mortality; Risk factors; Intensive care units

ARAŞTIRMA

POSTOPERATİF YOĞUN BAKIM ÜNİTESİNDE TAKİP EDİLEN 80 YAŞ ÜSTÜ KALÇA KIRIKLI HASTALARIN BİR YILLIK RETROSPEKTİF DEĞERLENDİRİLMESİ

Öz

Giriş: Tüm dünyada olduğu gibi ülkemizde de beklenen yaşam süresinin uzaması yıllık opere edilen yaşlı hasta yüzdesini artırmaktadır. Bu operasyonlar arasında en sık yapılanlardan biri kalça kırıklarına bağlı cerrahi girişimlerdir.

Gereç ve Yöntem: Bu araştırma, 2014-2015 yılları arasında Karabük Eğitim ve Araştırma Hastanesi Yoğun Bakım Ünitesinde yapılmıştır. Çalışmamıza, 80 yaş üzerinde, kalça kırığı nedeniyle operasyon geçirmiş olan ve postoperatif Yoğun Bakım Ünitesinde takibi yapılan hastalar alındı.

Bulgular: Hastaların yaş ortalaması 84.65±3.36 yıl idi ve bunların 50 si kadındı. 40 hastada trokanterik femur kırığı ve 32 hastada femur boyun kırığı vardı. Proksimal femur çivisi 38 ve parsiyel kalça protezi 34 hastaya uygulandı. 57 hastaya rejyonel anestezi 15 hastaya genel anestezi verildi. Hastane mortalitesi %16.6 idi. Hastalar yaşayan (60) ve ölenler (12) olarak gruplandırıldığında; ameliyat öncesi süre ölenlere yaşayanlara göre uzundu. Mekanik ventilatör ihtiyacı ve mekanik ventilatör süresi ve inotrop ihtiyacı ölen hastalarda yüksekti. Yoğun bakım ünitesi ve hastanede yatış süreleri de ölen hastalarda uzundu. Diğer parametrelerde anlamlı bir fark yoktu.

Sonuç: Çalışmamızda hastalarımızın mental değerlendirmeleri ve taburcu edildikten sonraki değerlendirmeleri yapılamamıştır. Operasyon gecikme nedenlerinin tanımlanmamış ve hastamemnuniyetinin kaydedilmemiş olması diğer bir kısıtlılıklarıdır. Bununla beraber operasyon gecikmedenlerini ve hasta memnuniyetini değerlendirmek için yeni bir araştırmaprotokolü oluşturmaya karar verdik.

Anahtar sözcükler: Yaşlı; Kalça kırıkları; Mortalite; Risk faktörleri; Yoğun bakım üniteleri

INTRODUCTION

As observed worldwide, life expectancy has been increasing in our country with a resultant increase in the annual rate of elderly patients who are operated. Surgical intervention for hip fracture is one of the most common surgeries among these patients (1,2).

Elderly patients with cardiovascular and respiratory comorbid diseases experience increased complications and mortality rates (3-6). Previous national and international studies have investigated risk factors that affect morbidity and mortality in these patients, including age, sex, ASA score, present comorbid diseases, drug usage, type of fracture, surgical interventions, method of anesthesia, duration of surgery, patients' referral time to the emergency ward (IWH, in working hours; OWH, out of working hours), time before surgery, and intensive care unit (ICU) and hospital stay durations. However, the results were controversial. Some studies suggested ASA score as the primary factor to predict complications and mortality rate (7,8). Age and male sex (9) and general anesthesia and time before surgery (10) were suggested as the primary factors causing high mortality rates. However, some other studies have reported contrasting results (11-13).

In this study, we aimed to analyze specific patients who were aged >80 years, classified as ASA III or IV, and postoperatively monitored at the ICU, and conduct a descriptive research on the factors that affect the prognosis of patients at our clinic in our newly built hospital.

MATERIALS AND METHOD

This descriptive study was performed between 2014 and 2015 at the ICU of the Karabük Education and Research Hospital. Using our hospital's digital data bank and patient files, data were collected for patients who were aged >80 years, who underwent a hip surgery, and who were postoperatively

monitored at the ICU. Patients who were aged <80 years, who did not require ICU care, and who died before the operation were excluded from the study.

A total of 72 patients were analyzed during the stated study period. The following patient characteristics and surgical parameters were recorded: age, sex, present comorbid diseases, time of referral to the emergency room (IWH/OWH), ASA score, fracture type [femoral neck fracture (FNF) or trochanteric femur fracture (TFF)], time before surgery, surgical intervention method [proximal femoral nail (PFN) or partial hip prosthesis (PHP)], anesthesia method [regional anesthesia (RA) or general anesthesia (GA)], duration of surgery, and the need for blood transfusion.

The following parameters were recorded during ICU follow-ups: need for mechanical ventilation (MV), dialysis, or inotropic agents and the durations of MV and ICU stay. Duration of hospitalization and hospital mortality were also evaluated.

Statistical analysis: Statistical analysis were performed using SPSS 14.0. Data were presented as the mean and standard deviation or number and percentage. The mean data were compared using the Student's *t*-test. Categorical data were compared using chi-square test or Fisher's exact test upon compatibility. *P*-values of <0.05 and <0.001 were considered significant.

RESULTS

The mean age of the patients was 84.65 ± 3.36 years, and there were 50 female patients (69.44%). The numbers of patients admitted to the emergency room IWH and OWH were 41 and 31, respectively. Sixteen patients had three or more comorbid diseases such as hypertension, diabetes, congestive heart disease, Alzheimer's disease, dementia, and cerebrovascular disease. The mean waiting time at the emergency room was 74.86 ± 35.77 minutes, and the mean time before surgery was 3.09 ± 1.33 days.



Regarding the fracture type, 40 patients showed TFF and 32 showed FNF. PFN was implanted in 38 patients and PHP in 34. RA was administered to 57 patients and GA to 15. The mean duration of surgery was 60.04±8.81 minutes.

Arterial catheterization was applied in 91% of the patients and central venous catheterization in 76%, intraoperatively or postoperatively. MV

was used during ICU follow-up in 18 patients, and the mean MV duration was 0.93±2.72 days. Eight patients underwent dialysis treatment and 19 required inotropic treatment. Preoperative blood transfusion was performed in 56 patients. The mean duration of ICU follow-up was 3.41±3.48 days and that of hospital stay was 8.34±5.19 days. The hospital mortality rate was 16.6% (Table 1).

Table 1. Demographics and other examined parameters of the patients.

Variables	
Age (years), mean±sd	84.65±3.36
Sex (female/male), n (%)	50/22 (69.44/30.56)
Time of referral to hospital (IWH/OWH), n (%)	41/31 (56.94/43.05)
Duration of waiting at emergency room (minutes), mean±sd	74.86±35.77
Time before surgery (days), mean±sd	3.09±1.33
Three or more comorbid diseases, n (%)	16 (22.22)
ASA (III/IV), n (%)	45/27 (62.5/37.5)
Type of fracture (TFF/FNF), n (%)	40/32 (55.56/44.44)
Anesthesia method (RA/GA), n (%)	57/15 (79.17/20.83)
Surgery method (PFN/PHP), n (%)	38/34 (52.77/47.23)
Duration of surgery (minutes), mean±sd	60.04±8.81
Duration of ICU follow-up (days), mean±sd	3.41±3.48
Duration of hospitalization (days), mean±sd	8.41±5.19
Need for MV, n (%)	18 (25)
Duration of MV (days), mean±sd	0.92±2.72
Artery catheter, n (%)	66 (91.66)
Central venous catheter, n (%)	55 (76.38)
Need for inotropics, n (%)	19 (26.38)
Need for blood transfusion, n (%)	56 (77.78)
Need for dialysis, n (%)	8 (11.11)
Mortality, n (%)	12 (16.67)

Data are stated as mean±standard deviation (mean±sd) or patient number and percentage (n, %).

TFF:trochanteric femur fracture, FNF:femoral neck fracture, GA:general anesthesia, RA:regional anesthesia, PHP:partial hip prosthesis, PFN:proximal femoral nail, ICU:intensive care unit, MV:mechanical ventilation.

When we grouped the patients as surviving (60) or deceased (12), we found that the time before surgery was significantly longer for the deceased patients than for the surviving ones. Additionally, the need for MV, its duration, and the need for inotropic agents were higher among deceased

patients than among the surviving ones. Also, the duration of ICU follow-up and hospital stay were longer for deceased patients than for the surviving ones. On the contrary, other parameters showed no significant differences between the two groups (Table 2).

Table 2. Comparison of demographic and clinical data of the surviving and deceased patients.

Variable	Surviving (n = 60)	Deceased (n = 12)	p value
Age (years), mean±sd	84.5±3.43	85.41±2.99	NS
Female sex, n (%)	42 (70)	8 (66.67)	NS
Time of referral to hospital, IWH, n (%)	34 (56.67)	7 (58.33)	NS
Time before surgery (days), mean±sd	2.85±1.23	4.33±1.15	< 0.01† *
Three or more comorbid diseases, n (%)	10 (16.67)	6 (50)	< 0.001* *
ASA IV, n (%)	19 (31.66)	8 (66.66)	< 0.001* *
Type of fracture, TFF, n (%)	32 (53.33)	8 (66.66)	NS
Anesthesia method, RA, n (%)	47 (78.33)	10 (83.33)	NS
Surgery method, PFN, n (%)	32 (53.33)	6 (50)	NS
Duration of surgery (minutes), mean±sd	58.14±10.4	62.21±9.2	NS
Duration of ICU follow-up (days), mean±sd	2.4±1.60	8.5±5.53	< 0.01† *
Duration of hospitalization (days), mean±sd	8.08±4.95	10.08±6.25	< 0.01† *
Need for MV, n (%)	8 (13.33)	10 (83.33)	< 0.001* *
Duration of MV (days), mean±sd	0.2±0.54	4.58±5.38	< 0.01† *
Need for inotropics, n (%)	10 (16.66)	9 (75)	< 0.001* *
Need for blood transfusion, n (%)	46 (76.66)	10 (83.33)	NS
Need for dialysis, n (%)	6 (10)	2 (16.66)	NS

Data are stated as mean±standard deviation (mean±sd) or patient number and percentage (n, %). †Student's t-test, *Pearson's chi-square test, *Statistically significant difference between groups

DISCUSSION

Our study revealed that the time before surgery, need and duration of MV, need for inotropic agents, and durations of ICU and hospital stays were significantly greater in the deceased patients than in the surviving ones. In addition, 50% of the

deceased patients had three or more comorbid diseases. We found no significant differences in the time of referral to the hospital, surgery and anesthesia methods, and type of fracture, which were examined and reported as effective, among the two groups.



The presence of comorbid diseases has been reported to affect mortality in elderly hip fracture patients. Meyer et al reported that the presence of two or more comorbid diseases caused a three-fold increase in the mortality rate (14). In a similar study, Roche et al found that the presence of three or more comorbid diseases was a major risk factor for mortality in elderly hip fracture patients (15). Similar to these results, 50% of the deceased patients in our study had three or more comorbid diseases.

Dailiana et al. reported a hospital mortality rate of 6.9%, and male sex, age of ≥ 85 years, presence of three or more comorbid diseases, and time before surgery of >48 hours increased the mortality rates (10). In our study, the deceased patients had waited longer than the surviving ones before undergoing a surgery.

Kannegaard et al. observed that male sex, advanced age, and presence of comorbid diseases were linked to high mortality rates (9). Liu et al found that the ASA score and postoperative complications were linked to mortality rates (8). In our study, we found that 66.66% of the deceased patients had an ASA score of IV.

Daugaard et al stated that ASA score, male sex, advanced age, and TFF increased the mortality rates; however, time of referral to hospital had no effect on the mortality rate (11). Foss et al and Schilling et al showed that patients who were

admitted on weekends and holidays had higher mortality rates (16,17). We found that the time of referral to hospital and duration of waiting at the emergency room did not differ between surviving and deceased patients.

Kilci et al stated that the presence of comorbid diseases, high ASA scores, and usage of prostheses with bone cement increased the mortality rates, but anesthesia method had no effect on mortality rate (12). Kopp et al found that type of fracture, time before surgery, and anesthesia and surgery methods had no effect on mortality rates (13). We found that the methods of surgery and anesthesia had similar effects between the two groups. There are, however, controversies regarding this topic in literature.

Our aim was to analyze a specific patient group with high risk, aged >80 years, classified as ASA III or IV, and postoperatively monitored at the ICU.

The main limitation of our study was its retrospective, single-center design and the absence of data regarding the patients' mental status and post-discharge conditions. In addition, patient satisfaction and the causes for delayed surgical intervention were not recorded. Therefore, in the light of this illustrative study, we have decided to form a new research protocol for a detailed evaluation of patient satisfaction and causes of delay for surgery.

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