ORIGINAL ARTICLE

AHI EVRAN MEDICAL JOURNAL
E-ISSN: 2619 - 9203

Decision-making for Postoperative Care in Geriatric Patients Undergoing Minor Surgeries using Mini Mental State Examination, Barthel Index of Activities of Daily Living and CSHA-Clinical Frailty Scale

Minör Cerrahi Geçiren Geriatrik Hastalarda Mini Mental Durum Muayenesi, Barthel Günlük Yaşam Aktiviteleri İndeksi ve CSHA-Klinik Kırılganlık Ölçeği ile Postoperatif Bakım Kararı Verme

Fatma Nur ARSLAN[1] *Filiz ÜZÜMCÜGİL*[2] *Basak AKCA*[2]

ÖZ

Amaç: Yaşlı hastalardaki majör cerrahileri takiben postoperatif sonucun tahmini, bilişsel işlev, işlevsel durum ve kırılganlıkla ilgili verilere dayanan bir karar verme süreci gerektirir. Bu çalışmada söz konusu parametrelerin minör cerrahiler için prediktif değerlerini değerlendirmeyi amaçladık.
Araçlar ve Yöntem: Elektif minör cerrahi planlanan American society of Anesthesiologists (ASA) skoru 1-3'e sahip ≥65 yaş hastalar çalışmaya alındı. Hastaneye yatıştaki kognitif fonksiyonu, fonksiyonel durumu ve kırılganlığı değerlendirmek için Mini Mental Test (MMSE), Barthel İndeksi (BI) ve Clinical Frailty Scale (CSHA-CFS) kullanıldı. Bu parametrelerin ameliyat sonrası yatış durumu ile ilişkileri değerlendirildi.
Bulgular: Doksan dokuz hasta çalışmaya dahil edildi. MMSE puanları, Barthel Indeksleri ve CSHA-CFS puanları tüm gruplarda benzerdi. Yatan hasta sayısı tek başına MMSE <24 (n=49 (%66.2)) veya MMSE<24 ve ASA>2 (n=19 (%82.6)) olan hastalarda daha fazlaydı. Kırılganlık skoru CSHA-CFS≥4 (n=33 (%75)) (p=0.025) veya ASA >2 (n=20 (%83.3)) (p=0.023) olan hastalarda yatan hasta sayısı daha yüksekti. ASA>2 olan hastalarda kırılganlık skorundan bağımsız olarak >1 gün yatış süresi (LOS) (p=0,036) ve yoğun bakım (PACU) kalış olasılığı (p=0.042) daha yüksekti. 30 gün içinde yeniden kabul ile parametreler arasında korelasyon yoktu.
Sonuç: ASA>2 ve MMSE<24 yatarak tedavi durumu ile korelasyon göstermektedir ve minör cerrahilerden sonra yaşlılarda kalış süresinin bir günden fazla olması için bağımsız bir prediktif faktördür. CSHA-CFS ≥4 olması ayrıca bağımsız olarak yatış verilmesi ile ilişkili bulunmuştur.

Anahtar Kelimeler: barthel indeksi; kırılganlık, minor cerrahi girişimler, MMSE; yatış süresi

ABSTRACT

Purpose: Prediction of postoperative outcome following major surgery in elderly patients requires a decision-making process based on data on cognitive function, functional status and frailty. In this study, we aimed to evaluate the predictive value of these parameters for minor surgeries.
Materials and Methods: Patients aged ≥65 years with American society of Anesthesiologists (ASA) score 1-3 scheduled for elective minor surgery were included in the study. Mini Mental Test (MMSE), Barthel Index (BI) and Clinical Frailty Scale (CSHA-CFS) were used to assess cognitive function, functional status and frailty at hospitalization. The associations of these parameters with postoperative hospitalization status were evaluated.
Results: Ninety-nine patients were included in the study. MMSE scores, Barthel Indices and CSHA-CFS scores were similar in all groups. The number of inpatients was higher in patients with MMSE<24 alone (n=49 (66.2%)) or MMSE<24 and ASA>2 (n=19 (82.6%)). The number of inpatients was higher in patients with a frailty score of CSHA-CFS≥4 (n=33 (75%)) (p=0.025) or ASA >2 (n=20 (83.3%)) (p=0.023). Patients with ASA>2 were more likely to have >1 day length of stay (LOS) (p=0.036) and intensive care unit (PACU) stay (p=0.042), independent of the frailty score. Readmission within 30 days was not correlated with the parameters.
Conclusion: ASA>2 and MMSE<24 correlate with inpatient status and are independent predictive factors for length of stay of more than one day in the elderly after minor surgery. CSHA-CFS ≥4 was also independently associated with hospitalization.

Keywords: barthel index; frailty; length of stay; minor surgical procedures; MMSE

Received: 31.07.2023; Accepted: 02.11.2023

[1]Kırşehir Ahi Evran University Faculty of Medicine Anesthesiology and Reanimation Department, Kırşehir, Türkiye.
[2]Hacettepe University Faculty of Medicine Anesthesiology and Reanimation Department, Ankara, Türkiye.

Corresponding Author: Fatma Nur Arslan, Kırşehir Ahi Evran University Faculty of Medicine Anesthesiology and Reanimation Department, Kırşehir, Türkiye.
e-mail: fatma.arlan@ahievran.edu.tr

How to cite: Arslan FN, Üzümcügil F, Akca B. Decision-making for postoperative care in geriatric patients undergoing minor surgeries using mini mental state examination, barthel index of activities of daily living and CSHA-clinical frailty scale. Ahi Evran Med J. 2024;8(1):69-76. DOI: 10.46332/aemj.1335000

INTRODUCTION

As the aging population grows, several pathologies which may benefit from surgery require a decision-making process regarding the postoperative outcome in these elderly patients. The functional status pertaining to activities of daily living (ADL) and cognitive functions have gained interest in the last decades, as aging or the presence of comorbidities alone were not found sufficient to predict postoperative outcome.[1-4] In addition to the individual assessments of functional status and cognitive functions, the concept of frailty has provided beneficial for the decision-making process of elderly patients scheduled for surgery.[1,2,5]

Cognitive disorders have been shown to be an important factor to predict the outcome of hospitalized older patients, especially with comorbidities.[3,6,7] The Mini Mental State Evaluation (MMSE) is a cognitive function test which has been recommended to be used for the preoperative evaluation of elderly patients to determine the level of cognitive disorder, as the presence of dementia and cognitive impairment was reported to be related with length of stay and 30-day unscheduled readmissions in these patients.[3] The MMSE scores in elderly patients were also reported to be correlated with the functional status, which also declines with aging.[3,4] The ADL assessment using Barthel Index (BI) has been suggested to be a reliable scoring system to evaluate the functional status, as the patients with higher BI scores were found to more evidently survive their postoperative ICU stay after major abdominal surgeries.[4] Aside from these two parameters individually assessing the cognitive function and functional status, frailty, which defines the vulnerability of an individual to have more tendency to develop mortality or dependency after exposing to a physical or phycological stress, has been recommended to be used for predicting clinical outcome of elderly patients.[2,5] Clinical Frailty Scale (CFS) developed by Canadian Study of Health and Aging (CSHA) was recommended to guide patient care through decision-making process determining which intervention will be either more likely to be beneficial or harmful for the individual, as it has been reported to be a significant predictor for several clinical outcomes including mortality, disability, length of stay in hospital, readmission, and functional and cognitive decline.[8-14] Current data support the impact of these scales for decision-making after major surgeries, however, there is limited data pertaining to its impact on minor surgeries.[10-12]

As minor surgeries are expected to result in lower complication rates related to the procedure itself in the postoperative period; the cognitive functions, functional status, and frailty assessment may provide more beneficial for decision-making in terms of postoperative care compared to major surgeries. In our study, we aimed to find out the impact of frailty parameters on the outcomes to lead decision-making regarding postoperative care in geriatric patients undergoing minor surgeries. For this purpose, the cognitive functions, the functional status and the frailty were evaluated using, MMSE, Barthel Index and CSHA-CFS, respectively in geriatric patients undergoing minor surgeries.

MATERIALS and METHODS

This study was designed as prospective clinical trial. The ethical guidelines outlined in the 1964 Declaration of Helsinki and its later revisions have been followed in the conduct of this investigation. After obtaining Hacettepe University Non-Interventional Clinical Research Ethics Committee approval (GO-18/1123, 2019/01-08), the patients ≥ 65 years of age with ASA score 1-3, who were scheduled to undergo elective minor surgeries (eye surgery, urological surgery, general surgery) under general anaesthesia between 10th January-10th June 2019 were enrolled.

All patients were informed, and consent was obtained from each to perform three separate preoperative assessments for cognitive function, functional capacity and frailty. The cognitive functions were assessed using Mini Mental State Evaluation (MMSE) (Score: 0-30).[15] A cut-off score of 24 was used, as it has been suggested to differentiate MMSE≥24, normal cognition; from MMSE<24, cognitive impairment to some degree.[16] The functional status was assessed using Barthel Index (BI) of Activities of Daily Living (ADL) to determine the disability and functional dependency of the patients revealing scores of < 20, 20-39, 40-59, 60-79 and 80-100 interpreted as total dependence, very dependent, partially dependent, minimally dependent

and live independently, respectively.[17] The frailty was assessed using Canadian Study of Health and Aging-Clinical Frailty Scale (CSHA-CFS) in order to determine the severity of frailty with 7-point scale. CSHA-CFS≥4 (frail to some degree) has been suggested as the cut-off score strictly correlated with postoperative outcome, determining 'apparently vulnerable' (CFS 4), 'mildly frail' (CFS 5), 'moderately frail' (CFS 6) and 'severely frail' (CFS 7) patients, discriminating the 'very fit' (CFS 1), 'well' (CFS 2) and 'well with treated comorbid disease' (CFS 3) patients (Table 1).[1,2] Data regarding comorbidity and demographics, as well as, the parameters such as unanticipated weight loss, falling accidents, depression and drug use was obtained. Albumin and haematocrit levels were obtained from records, which were within at least 1 month prior to surgery.

In our hospital, the status of the patients in terms of postoperative care as either outpatient or inpatient following elective minor surgery was decided by a multidisciplinary team including the geriatrist, anaesthesiologist and surgeon prior to surgery considering age, co-morbidities and anticipated postoperative complications. The length of stay (LOS) in inpatient status was at the initiative of the same multidisciplinary team, as well. In this study, the primary outcome was the relationship between the cognitive functions, functional capacity and frailty with the decision-making regarding the postoperative status of the patient as being either outpatient or inpatient and also for need of Post Anaesthesia Care Unit (PACU), as well as, the length of stay and readmission within 30-days after surgery. Age, ASA scores, unanticipated weight loss, falling accidents, depression, albumin and haematocrit levels, polypharmacy were evaluated as secondary outcome parameters in terms of their impact on the decision-making regarding the postoperative status of the patient as being either outpatient or inpatient and also for need of Post Anaesthesia Care Unit (PACU), as well as, the length of stay and readmission within 30-days after surgery.

The LOS was defined by < 1 day if the patient was admitted to hospital for an overnight stay postoperatively. PACU stay was included in the inpatient group for the correlation analysis, hence, the inpatient group represented all patients other than outpatients, unless otherwise stated.

Statistical Analysis

The data was analysed by IBM SPSS statistics 17.0 (IBM Corporation, Armonk, NY, USA). The distribution of continuous numerical variables was examined by using Kolmogorov-Smirnov test, while the assumption of homogeneity of variances were investigated by Levene's test. Descriptive statistics were shown by mean ± SD or median (1^{st} quartile-3^{rd} quartile) for continuous numeric variables and by number cases and % for categorical variables.

The significance of the differences between groups in term of continuous numeric variables was evaluated using Student's t test, whereas, the significance of the differences between independent groups more than two was evaluated using One-Way ANOVA where the assumptions for parametric test were met. The significance of the differences between groups in term of continuous numeric variables was evaluated using Mann Whitney U test when the number of groups was two, whereas, the significance of the differences between independent groups of more than two was evaluated using Kruskal Wallis test where the assumptions for parametric test were not met.

The categorical data was evaluated using Fisher's exact probability test or Continuity Chi-Square test according to the expected frequency in 2 x 2 crosstabs was below 5 in least ¼ of the cells or between 5-25, respectively. Otherwise, Pearson's Chi-square test was used.

The combined effect of the parameters that may contribute to the status of the patient either as outpatient or inpatient, the length of hospital stays either < 1 day or >1 day, estimation of PACU stay and unscheduled readmission within 30-days was evaluated using multivariate logistic regression analysis. The variables revealing $p<0.25$ as a result of univariate statistical analysis were included in the regression models as candidate factors. Haematocrit levels and diagnosed depression were included in the regression model for unscheduled readmission within 30-days, in which neither of these parameters were found predictive. The only factor that can be predictive for the LOS and estimation of PACU stay was ASA, hence, multiple regression analysis was not performed. The odds ratio, 95% con-

fidence interval and Wald statistics were calculated pertaining to each variable. p<0.05 was accepted statistically significant.

RESULTS

Ninety-nine patients ≥ 65 years of age were included. The demographics and the data regarding outpatient and inpatient, as well as, the patients with postoperative PACU stay were presented in Table 1. The primary and secondary parameters related to postoperative outcomes were presented in Table 2.

Table 1. The demographics and the data regarding outpatient and inpatient status, as well as, the PACU stay postoperatively.

Variables	N=99
Age (years)	72.1 ± 5.9
Gender	
Female	59 (59.6%)
Male	40 (40.4%)
Weight (kg)	76.7 ± 15.8
BMI	27.4 (24.9-31.2)
BMI Groups (n)	
<25 kg/m2	25 (25.3%)
25.0-29.99 kg/m2	39 (39.4%)
30.0-40.0 kg/m2	30 (30.3%)
>40 kg/m2	5 (5.1%)
Outpatient group (n (%))	38 (38.4%)
Inpatient group (Including PACU stay) (n (%))	61 (61.6%)
PACU stay (n (%))	5 (5.1%)
Length of hospital stay (day)	1 (0-2)
<1 day (n (%))	25 (25.2 %)
>1 day (including PACU) (n (%))	36 (36.3%)

BMI: Body Mass Index, PACU: Post Anesthesia Care Unit (Intensive Care)

The MMSE scores, BIs and CSHA-CFS scores were similar in patients who were decided either to be at outpatient or inpatient status after minor surgery. Considering the cut-off value of 24 for MMSE, among the patients with MMSE < 24 (n=74), 23 (31%) had ASA > 2 and 82.6% (n=19) of these were inpatients (Table 3). Considering the cut-off value for CFS of ≥ 4, the number of patients revealing a score of ≥ 4 interpreted as 'frail to some degree' was higher in inpatient group (p=0.025). The number of patients who stayed > 1 day were higher among patients with CFS≥4, despite statistical insignificance (Table 3).

Table 2. The primary and secondary parameters of the study evaluated for their impact on postoperative outcome.

Parameters	
Albumin (g/dl)	4.1 (3.9-4.3)*
Haematocrit (%)	39.5* ± 4.8
	Patients (n)
Weight loss	9 (9.1%)
Falling accidents (number of events)	
0	89 (89.9%)
1	6 (6.1%)
>1	4 (4.0%)
Depression	
None	82 (82.8%)
Without diagnosis	13 (13.1%)
With diagnosis	4 (4.0%)
Polypharmacy (≥5 drugs)	18 (18.2%)
ASA physical status	
1	10 (10.1%)
2	65 (65.6%)
3	24 (24.3%)
Scores (min-max)	
MMSE Score	21.0 (16.0-24.0)*
MMSE	Patients (n)
<24	78 (79%)
≥24	21 (21%)
Barthel Score of ADL	100.0 (95.0-100.0)
CSHA-CFS	3.0 (3.0-5.0)
CSHA-CFS	Patients (n)
<4	55 (55.6%)
≥4	44 (44.4%)

*Mean (min-max), ASA: American Society of Anesthesiologists, MMSE: Mini Mental Scor-ing Examination, ADL: Activities of Daily Living, CHSA-CSF: Canadian Study of Health and Aging (CSHA) - Clinical Frailty Scale (CFS)

The secondary parameters including age, gender, BMI, albumin and haematocrit levels, weight loss, the history of falling accidents, depression and polypharmacy were similar in all patients pertaining to outpatient and inpatient status, as well as, in patients with the LOS either < 1 or > 1 day (Table 3).

The evaluation of the combined effect of ASA and CSHA-CFS revealed that patients with ASA score of > 2 had 4.9 times (95% CI: 1.108-21.614) more probability of LOS < 1 day and 3.7 times (95% CI: 1.066-13.126) more probability of LOS > 1 day irrespective of CFS (p=0.036).

PACU stay was not found to be related with any of the primary and secondary parameters. However, the parameters which revealed p<0.25 were included in regression model as a result of univariate analysis. The most predictive parameter of PACU stay was ASA score > 2. The patients with ASA score > 2 had 13.9 times (95% CI: 1.095-176.132) more probability to need PACU stay after minor surgery compared to patients with ASA score 1 - 2 irrespective of other parameters (p=0.042).

The readmission within 30-days (n=13 (13.1%)) were mostly related to surgical complications (n=8 (8.1%)), while the other related causes were cardiac (n=3 (3.0%)), respiratory (n=1 (1.0%)) and renal (n=1 (1.0%)) without any need for further intervention and none of the primary or secondary parameters were found to be related with these causes (p>0.05).

Table 3. The relationships between the primary and secondary parameters with postoperative outcomes regarding outpatient and inpatient status of the patients after minor surgery, as well as, the length of stay.

Parameters	**Outpatient (n=38)**	**Inpatient (n=61)**		**p**
		<1 day (n=25)	**>1 day (n=36) (Including PACU stay)**	
Albumin (g/dL) (min-max)	4.2 (3.9-4.3)	4.1 (3.8-4.2)	4.1 (3.8-4.2)	0.298†
Haematocrit (%) (mean±SD)	40.2 ± 5.2	39.5 ± 4.8	38.8 ± 4.4	0.447¥
Weight loss (n)	2 (5.3%)	3 (12.0%)	4 (11.1%)	0.553¶
Falling accidents (n)	3 (7.9%)	3 (12.0%)	4 (11.1%)	0.839¶
Depression (n)	1 (2.6%)	2 (8%)	1 (2.8%)	0.554¶
Polypharmacy (≥5)	5 (13.2%)	4 (16.0%)	9 (25%)	0.397‡
ASA>2	4 (10.5%) a, b, c		20 (32.8%) c	0.023#
		9 (36.0%) a	11 (30.6%) b	0.038‡
Scores (min-max)				
MMSE Score	21.0 (16.0-26.0)	20.0 (15.0-24.0)	20.0 (16.0-22.0)	0.434†
MMSE				0.167†
<24 (n=74)	25 (33.8%)		49 (66.2%)	0.082†
Barthel Score of ADL	100.0 (98.7-100.0)	100.0 (95.0-100.0)	100.0 (95.0-100.0)	0.847†
ASA ≤2 (n=51)	21 (41.2%)		30 (58.8%)	
		9 (29%)	21 (71%)	
ASA >2 (n=23)	4 (17.4%)		19 (82.6%)	
		9 (47.4%)	10 (52.6%)	
≥24 (n=25)	13 (52%)		12 (48%)	0.480‡
ASA ≤2 (n=24)	13 (54.2%)		11 (45.8%)	
		6 (60%)	4 (40%)	
ASA >2 (n=1)	0		1	
		0 (0%)	1 (100%)	
CSHA-CFS	3.0 (3.0-4.3)	4.0 (3.0-5.0)	4.0 (3.0-5.0)	0.343†
CSHA-CFS				
<4 (n)	27 (49%)		28 (51%)	
		12 (42.9%)	16 (57.1%)	0.990#
≥4 (n)	11 (25%)		33 (75%)	0.025#
		13 (39.4%)	20 (60.6%)	0.990#

Likelihood ratio, † Kruskal Wallis test, ¥One-Way Anova, ‡Pearson's chi-square test #Continu-ity correction chi-square. ASA: American Society of Anesthesiol-ogists, MMSE: Mini Mental Scoring Examination, ADL: Activities of Daily Living, CHSA-CSF: Canadian Study of Health and Aging (CSHA) - Clinical Frailty Scale (CFS)

DISCUSSION

In our study, the patients admitted to hospital at inpatient status for a LOS > 1 day postoperatively after elective minor surgeries were found to have CSHA-CFS of ≥ 4. Thus, frailty defined by CSHA-CFS revealed that it may provide useful data in decision-making regarding postoperative care in geriatric patients undergoing minor surgeries.

The cognitive disorders have been reported to predict worse outcomes in hospitalized older patients.[18,19] In a recent retrospective study by Chao et al., the hospitalized older patients were classified according the MMSE scores, and in the presence of dementia and cognitive impairment. In this study, the number and severity of comorbidities were found to be predictors of LOS and unscheduled readmission within 30-days in hospitalized older patients, whereas, the number of comorbidities was also found to predict the LOS in patients with normal cognitive function

in terms of MMSE.[3] In our study, the MMSE revealed similar scores in all patients. However, we observed that the patients with MMSE<24 were higher in inpatient group, and additionally, the patients with MMSE<24 who had an ASA physical status of > 2 were higher in inpatient group, supporting the study by Chao et al. Moreover, in our study the comorbidities revealing an ASA physical status > 2 was also an independent predictor of inpatient status after minor surgery in elderly patients.

The Activities of Daily Living (ADL), which is widely assessed using Barthel Index (BI) has been reported to reliably reflect the functional status and ability to live independently in older patients.[4] In a study by Kang et al. BI < 30 was reported to constitute a cut-off value to predict ICU-survival in patients ≥ 65 years of age, who underwent elective major abdominal surgery. In our study, the BIs revealed scores > 95 interpreted as live independently, thus it was not expected to cause difference in terms of either outpatient or inpatient status, as well as, the LOS and readmission within 30 days. However, we did not evaluate the BI at discharge, thus, we cannot deduce any relationship pertaining to the change in BI during hospitalization.

In a study by Makary et al. addressing both major and minor surgeries, frailty was found as an independent factor for predicting prolonged hospital stay, while its predictive value increased when combined with ASA assessment.[20] In our study, we used CSHA-CFS for frailty assessment and the threshold for frailty was CSHA-CFS ≥ 4, which has been suggested for being the cut-off value significantly correlated with postoperative outcome.[2,21]

In a study by Cheung et al. the CHSA-CFS revealed a 62% of frailty to some degree (CSHA-CFS ≥ 4) in patients ≥ 65 years admitted to a trauma centre, however, the authors classified the frailty as non-frail, pre-frail and frail, thus frailty incidence revealed 14.2% with patients having CHSA-CFS of 6-7.[22] The incidence of frailty (frailty to some degree according to CSHA-CFS stratification) was found to be 44.4% (n=44) in our patient group similar to 38% in the study by Artiles-Armas et al. and 62% in the study by Cheung et al., all of which constituted higher incidences than the other studies.[2,22-24] In our hospital we performed CSHA-CFS easily and found the stratification according to a threshold of ≥ 4 feasible.

It cannot be denied that major surgeries may have more deleterious effects regarding postoperative care in geriatric patient group.[13,20,25] However, minor surgeries may be expected to result in lower surgery-related postoperative complications; therefore, frailty might become a more leading parameter to decide for postoperative care compared to major surgeries. In our study, frailty was found to be an independent predictor for hospital stay and length of hospital stay after minor surgery. In our study, comorbidity, cognition, fall, haematocrit and albumin levels were not found to be related with these outcomes, individually or in combination. On the other hand, the ASA scores were found to be a factor leading to an impact on LOS in our study. The inpatient numbers were higher in patients with ASA > 2 compared to outpatients. The hospitalization either for < 1 day or > 1 day was higher in patients with ASA > 2 with probability of 4.9 times and 3.7 times compared to patients with ASA 1-2, respectively. However, there was no unanticipated hospitalization in our study, hence ASA scores can be considered safe to use as a predicting factor for hospitalization and LOS.

In our study, geriatricians, surgeons and anaesthetists decided together for patients who were admitted to PACU for postoperative care considering age, co-morbidities and anticipated complications. However, none of the parameters regarding frailty assessment including the CSHA-CFS score was found to be related with postoperative PACU stay.

Readmission to hospital within 30 days after surgery was reported to be mostly related to postoperative complications.[26] In our study, the incidence of readmission to hospital within 30 days was 14.1% and the incidence of postoperative complications regarding surgical intervention leading to readmission was 8.1%, without any correlation with any parameters regarding frailty assessment. Postoperative complications are known to be the most important cause of readmission[27] and their correlation with frailty has been reported to be significant,[28] nevertheless this correlation was not found in our study most probably due to the small patient group or the targeted surgical type which included only minor surgeries. However, similar to our study, frailty index was not found to be correlated with postoperative complications and readmission within 30-

days irrespective of the type of surgery, which was suggested to be related with the coordination between the geriatricians and surgical team on decision-making regarding the perioperative care.[29] In our hospital a similar coordination has been handled for these patients, which might constitute a beneficial approach leading to our results, as well.

The limitations of our study include, firstly, the inclusion of mostly eye surgeries and urological minor surgeries. Conducting the study with a wider surgical diversity may eliminate possible differences that may arise from differences between surgical branches. There were five patients admitted to the postoperative intensive care unit throughout the study. Although there is no statistically significant correlation between frailty parameters and intensive care admission, we believe that this finding should be reconsidered with other studies conducted only with intensive care patients, including a larger number of patients, and using other frailty scales.

As conclusion, in our study, the ASA score > 2, MMSE < 24 and the frailty score defined by CSHA-CFS ≥ 4 was found to be correlated with the decision on the postoperative care of geriatric patients after minor surgeries in favour of inpatient status. These preoperative assessments as well as the routine assessments regarding comorbidities may prove beneficial for decision-making regarding postoperative care in geriatric patients undergoing minor surgeries.

Conflict of Interest

The authors declare that there is not any conflict of interest regarding the publication of this manuscript.

Ethics Committee Permission

The study was approved by Hacettepe University Non-Interventional Clinical Research Ethics Committee (2019/01-08 date and GO-18/1123 number).

Authors' Contributions

Concept/Design: FNA, FÜ. Data Collection and/or Processing: FNA, FÜ. Data analysis and interpretation: FNA, FÜ, BA. Literature Search: FNA, FÜ. Drafting manuscript: FNA, FÜ, BA. Critical revision of manuscript: FÜ, BA. Supervisor: FÜ, BA.

REFERENCES

1. Rockwood K, Song X, MacKnight C, et al. A global clinical measure of fitness and frailty in elderly people. CMAJ. 2005;173(5):489-495.
2. Artiles-Armas M, Roque-Castellano C, Conde-Martel A, et al. The comprehensive complication index is related to frailty in elderly surgical patients. J. Surg. Res. 2019;244:218-224.
3. Chao YT, Kuo FH, Lee YS, et al. Characteristics and Outcome Determinants of Hospitalized Older Patients with Cognitive Dysfunction. Int J Environ Res Public Health. 2022;19(1):584.
4. Kang Y, Zhang G-C, Zhu J-Q, et al. Activities of daily living associated with postoperative intensive care unit survival in elderly patients following elective major abdominal surgery: An observational cohort study. Medicine. 2021;100(22):e26056.
5. Church S, Rogers E, Rockwood K, et al. Scoping review of the Clinical Frailty Scale. BMC geriatrics. 2020;20(1):1-18.
6. Mukadam N, Sampson EL. A systematic review of the prevalence, associations and outcomes of dementia in older general hospital inpatients. Int. Psychogeriatr. 2011;23(3):344-355.
7. Zekry D, Herrmann FR, Grandjean R, et al. Demented versus non-demented very old inpatients: the same comorbidities but poorer functional and nutritional status. Age Ageing. 2008;37(1):83-89.
8. Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: evidence for a phenotype. J Gerontol A Biol Sci Med Sci. 2001;56(3):M146-M156.
9. Fried LP, Ferrucci L, Darer J, et al. Untangling the concepts of disability, frailty, and comorbidity: implications for improved targeting and care. J. Gerontol. A Biol. Sci. Med. Sci. 2004;59(3):M255-M263.
10. Shah R, Borrebach JD, Hodges JC, et al. Validation of the Risk Analysis Index for evaluating frailty in ambulatory patients. J Am Geriatr Soc. 2020;68(8):1818-1824.
11. Varley PR, Borrebach JD, Arya S, et al. Clinical utility of the risk analysis index as a prospective frailty screening tool within a multi-practice, multi-hospital integrated healthcare system. Ann. Surg. 2021;274(6): e1230-e1237.
12. Shinall MC, Arya S, Youk A, et al. Association of preoperative patient frailty and operative stress with postoperative mortality. JAMA surgery. 2020;155(1): e194620-e194620.
13. Andreou A, Lasithiotakis K, Venianaki M, et al. A comparison of two preoperative frailty models in predicting postoperative outcomes in geriatric general surgical patients. World J. Surg. 2018;42:3897-3902.
14. Lee SY, Lee S-H, Tan JH, et al. Factors associated with prolonged length of stay for elective hepatobiliary and neurosurgery patients: a retrospective medical record review. BMC Health Serv. Res. 2018;18(1):1-9.
15. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975;12(3):189-198.
16. Güngen C, Ertan T, Eker E, et al. [Reliability and validity of the standardized Mini Mental State Examination in the diagnosis of mild dementia in Turkish population]. Turk Psikiyatri Derg. 2002;13(4):273-281.
17. Collin C, Wade D, Davies S, et al. The Barthel ADL Index: a reliability study. Int. Disabil. Stud. 1988;10 (2):61-63.

18. Formiga F, Fort I, Robles MJ, et al. Comorbidity and clinical features in elderly patients with dementia: differences according to dementia severity. J Nutr Health Aging. 2009;13(5):423-427.
19. Duthie A, Chew D, Soiza R. Non-psychiatric comorbidity associated with Alzheimer's disease. QJM. 2011;104(11):913-920.
20. Makary MA, Segev DL, Pronovost PJ, et al. Frailty as a predictor of surgical outcomes in older patients. J. Am. Coll. Surg. 2010;210(6):901-908.
21. Okabe H, Ohsaki T, Ogawa K, et al. Frailty predicts severe postoperative complications after elective colorectal surgery. Am J Surg. 2019;217(4):677-681.
22. Cheung A, Haas B, Ringer TJ, et al. Canadian study of health and aging clinical frailty scale: does it predict adverse outcomes among geriatric trauma patients? J. Am. Coll. Surg. 2017;225(5):658-665.
23. Walston J, Hadley EC, Ferrucci L, et al. Research agenda for frailty in older adults: toward a better understanding of physiology and etiology: summary from the American Geriatrics Society/National Institute on Aging Research Conference on Frailty in Older Adults. J Am Geriatr Soc. 2006;54(6):991-1001.
24. Birkelbach O, Mörgeli R, Spies C, et al. Routine frailty assessment predicts postoperative complications in elderly patients across surgical disciplines–a retrospective observational study. BMC Anesthesiol. 2019;19(1):1-10.
25. Robinson TN, Wu DS, Pointer L, et al. Simple frailty score predicts postoperative complications across surgical specialties. Am. J. Surg. 2013;206(4):544-550.
26. Merkow RP, Ju MH, Chung JW, et al. Underlying reasons associated with hospital readmission following surgery in the United States. Jama. 2015;313(5):483-495.
27. Glance LG, Kellermann AL, Osler TM, et al. Hospital readmission after noncardiac surgery: the role of major complications. JAMA Surg. 2014;149(5):439-445.
28. Lin HS, Watts JN, Peel NM, et al. Frailty and postoperative outcomes in older surgical patients: a systematic review. BMC Geriatr. 2016;16(1):157.
29. Shahrokni A, Tin A, Alexander K, et al. Development and evaluation of a new frailty index for older surgical patients with cancer. JAMA Network Open. 2019;2 (5):e193545-e193545.