

Comparison of fall risk and risk factors between inpatients aged under 65 years and above in an internal medicine clinic

İç hastalıkları servisinde yatan 65 yaş altı ve üstü hastaların düşme riski ve risk faktörlerinin karşılaştırılması

Aslı Kılavuz ¹

Selahattin Fehmi Akçiçek ¹

Ege University, Division of Geriatrics, Department of Internal Medicine, Izmir, Turkey

ABSTRACT

Aim: The aim of this study is to retrospectively evaluate and compare fall risk and risk factors inpatients aged under 65 years and above in an internal medicine clinic.

Materials and Methods: The study is retrospective and descriptive. The study included 224 patients who were hospitalized for any complaint in the internal medicine clinic of a university hospital between June 2019 and August 2019, and whose data on falls were fully recorded. The sociodemographic variables of the patients, chronic diseases, the number of drugs and the number of risky drugs for falls, and the data of the Itaki fall risk scale were recorded.

Results: The mean age of the patients was 63.18 ± 17.66 (23-95) years. A statistically significant difference was found between inpatients aged under 65 years and above in terms of itaki fall risk score, number of chronic diseases, hypertension, diabetes mellitus, heart disease, neurological diseases and number of drugs, number of risky drugs, antidiabetic and antiarrhythmic drugs. A statistically significant difference was found between inpatients aged under 65 years and above in terms of fall risk according to the Itaki fall risk scale ($p = 0.038$).

A statistically significant difference was found between inpatients aged under 65 years and above with a high risk of falling in terms of the number of chronic diseases ($p = 0.001$), presence of diabetes mellitus ($p = 0.007$), presence of hypertension ($p = 0.001$), presence of heart disease ($p = 0.002$), presence of neurological disease ($p = 0.03$), and number of risky drugs ($p = 0.01$).

Conclusion: Falls are an important problem in all age groups. Although fall risk is higher inpatients aged 65 years and above, care should be taken in terms of precautions to be taken to prevent falls in all patients. All risk factors associated with falls should be questioned in all hospitalized patients.

Keywords: Elderly, young, fall, fall risk, hospitalized patient.

ÖZ

Amaç: Bu araştırmanın amacı, bir üniversite hastanesi iç hastalıkları kliniğinde yatan 65 yaş altı ve üstü hastalarda düşme riski ve risk faktörlerinin retrospektif olarak değerlendirilmesi ve karşılaştırılmasıdır.

Gereç ve Yöntem: Araştırma retrospektif, tanımlayıcı tipte olup, araştırmaya Haziran 2019 - Ağustos 2019 tarihleri arasında bir üniversite hastanesinin iç hastalıkları kliniğinde herhangi bir yakınma nedeniyle yatarak tedavi görmüş dosyasında düşme ile ilgili verileri eksiksiz olarak kaydedilmiş olan 224 hasta dahil edilmiştir. Hastaların sosyo-demografik değişkenleri, kronik hastalıkları, hastaneye yatış sırasında kullanılan ilaç sayısı ve düşme için riskli ilaç sayısı gibi klinik verileri ve Itaki düşme riski ölçeği verileri kaydedilmiştir.

Corresponding author: Aslı Kılavuz
Ege University, Division of Geriatrics, Department of Internal
Medicine, Izmir, Turkey
E-mail: asli.kilavuz@ege.edu.tr

Bulgular: Hastaların yaş ortalaması $63,18 \pm 17,66$ (23-95) yıldır. 65 yaş altı ve 65 yaş ve üstü hastalar arasında İtali düşme skoru, kronik hastalık sayısı, kronik hastalık varlığı, hipertansiyon, diabetes mellitus, kalp hastalığı, nörolojik hastalıklar, kullanılan ilaç ve riskli ilaç sayısı, düşme için riskli ilaçlardan antidiyabetik ve antiaritmik ilaçlar açısından istatistiksel olarak anlamlı fark bulunmuştur. İtali düşme riski ölçeğine göre düşme riski açısından 65 yaş altı ve 65 yaş ve üstü hastalar arasında istatistiksel olarak anlamlı fark bulunmuştur ($p = 0,038$). Yüksek düşme riski olan <65 yaş ve ≥ 65 yaş gruplar karşılaştırıldığında kronik hastalık sayısı ($p = 0,001$), DM varlığı ($p = 0,007$), HT varlığı ($p = 0,001$), kalp hastalığı varlığı ($p = 0,002$), nörolojik hastalık varlığı ($p = 0,03$) ve riskli ilaç sayısı ($p = 0,01$) açısından iki grup arasında istatistiksel olarak anlamlı fark bulunmuştur.

Sonuç: Düşmeler tüm yaş gruplarında önemli bir sorundur. Özellikle 65 yaş ve üstü grupta düşme riski daha yüksek saptanmasına rağmen tüm hastalarda düşmelerin engellenmesi için alınacak önlemler açısından dikkatli olunmalıdır. Hastaneye yatan tüm hastalarda düşmeler ile ilişkili tüm risk faktörleri sorgulanmalıdır.

Anahtar Sözcükler: Yaşlı, genç, düşme, düşme riski, yatan hasta.

INTRODUCTION

A fall is defined as an individual becoming immobile at a lower level than the current level not led by a force, syncope or a stroke but due to lack of attention and loss of balance (1, 2). In order to prevent one of the most frequently observed accidents throughout the world which is falling, safe environments have to be provided (3, 4). It is not possible to clear the fall risk of inpatients however; with the assessment of the fall risk, an efficient prevention program can be constituted which can minimize the risk (5, 6). It is indicated that physiological changes and chronic diseases caused by aging increase the risk of falls (7, 8). It is also stated that 2.9 to 13 of 1000 hospitalized patients fall (4). More than 80% of the falls that occur in hospitals are observed in the individuals aged 65 years and above (9). In a study conducted in Turkey, the fall rate of hospitalized patients aged 65 years and above is stated as 10% (10). Even though falls are common in the older adults, every hospitalized patient encounters the fall risk regardless of their age.

Falls might lead to injuries such as skull fractures, subdural hematoma and massive bleeding as well as delayed recovery, prolonged hospital stay, increased care costs, decreased quality of life, fear of falling, mortality, morbidity, immobility, and early placement in nursing home (11, 12).

Intrinsic risk factors for falling include a history of falling, gait and balance disorder, peripheral neuropathy, vestibular impairment, muscle weakness, hearing and vision impairment, incontinence and nocturia, advanced age, orthostatic hypotension, dementia, depression anxiety, polypharmacy, and risky medication use.

Environmental factors, unsuitable footwear and obstacles are also extrinsic risk factors (4, 13).

The aim of this study is to retrospectively evaluate and compare fall risk and risk factors inpatients aged under 65 years and above in an internal medicine clinic.

MATERIALS AND METHODS

The study has been retrospective and descriptive with the sample being 269 patients admitted to and treated by an internal diseases clinic of a university hospital between the dates of June-August 2019 with any type of complaints. Patient files have been scanned retrospectively. Afterwards, 224 patients whose data on falls were fully recorded have been included to the study. The research protocol was approved by the local ethics committee on January 01, 2020 (Approval Number: 22.01.2020/20-1.1T/56). Patients' sociodemographic variables such as age and gender; their clinical data such as chronic diseases, the number of drugs, and risky drugs (psychotropic drugs, sedative hypnotic drugs, antipsychotics, neuroleptics, antidepressants, diuretics, antidiabetics, antiarrhythmics, antihypertensives, chemotherapeutics, laxatives, corticosteroids) they used on the first day of hospitalization and and İtali fall risk scale scores which is performed on every inpatient have been recorded.

İtali fall risk scale has been prepared for patients aged 17 years and above. It includes patients' demographics, the reason why the assessment is being administered and lastly the minor and major risk factors. The scale includes a total of 19 risk factor questions; 11 minor and 8 major ones that cause patients to fall. Minor risk factors count

as 1 point while major risk factors count as 5 points. If the total score of a patient is between 0-4, the risk is considered as low and if it is 5 or above, the risk is considered as high. Itaki fall risk scale has been published in 2011 by Turkish Health Ministry Head of Performance Administration and Quality Improvement Department (14).

Statistical analyses

SPSS Statistics Version 22.0 program was used for all statistical analyses and calculations. During the analysis process; percentages, averages, chi square analysis, Fisher's Exact test and Mann Whitney U test have been employed. Kolmogorov-Smirnov test was used to evaluate the normal distribution. Values with a p value <0.05 were considered statistically significant.

RESULTS

224 patients hospitalized in internal diseases clinic have been included in our study. 104

(46.4%) of the patients were aged under 65 years and 120 (53.6%) of them were aged 65 and above. The mean age of the patients was 63.18 ± 17.66 years (23-95) (aged under 65 years 47.08 ± 11.07; 65 and aged above 65 years 77.13 ± 7.47). Sociodemographic and clinically descriptive characteristics of the inpatients were shown in Table 1. 97.8% of the patients had at least one chronic disease. The most frequently observed chronic diseases were hypertension (55.8%), chronic renal failure (45.5%) and diabetes mellitus (33.9%).

A statistically significant difference was found between the two age groups in terms of Itaki fall risk scale score, the number of chronic diseases; the presence of chronic disease, hypertension (HT), diabetes mellitus (DM), heart disease, neurological diseases and other diseases; the number of drugs and risky drugs used, anti-diabetic and antiarrhythmic drugs from risky drugs for falls (Table-1-2).

Table-1. Sociodemographic and clinically descriptive characteristics of the inpatients.

Characteristic	Total n = 224	Aged <65 n = 104	Aged ≥65 n = 120	p
Gender, n (%)				0.40 ^a
Female	108 (48.2)	47 (43.5)	61 (56.5)	
Male	116 (51.8)	57 (49.1)	59 (50.9)	
Itaki fall risk scale score[*]	10.6 ± 4.16	8.63 ± 4.0	11.3 ± 3.92	0.001^b
Number of chronic diseases^{**}	2 (1-6)	2 (1-5)	3 (1-6)	0.001^b
Presence of chronic diseases, n (%)	207 (92.4)	85 (42.5)	115 (57.5)	0.001[*]
Chronic Diseases, n[†] (%)^{††}				
HT	125 (55.8)	41 (39.4)	84 (70)	0.001^a
DM	76 (33.9)	24 (23.1)	52 (43.3)	0.001^a
Heart Disease	53 (23.7)	13 (12.5)	40 (33.3)	0.001^a
CRF	102 (45.5)	51 (49)	51 (42.5)	0.327 ^a
Malignancy	47 (21)	23 (22.1)	24 (20)	0.70 ^a
Neurological diseases	31 (13.8)	9 (8.7)	22 (18.3)	0.036^a
Others	86 (38.4)	43 (41.4)	43 (35.8)	0.008^a
Number of drugs^{**}	5 (0-16)	4 (0-16)	5 (0-13)	0.014^c
Number of risky drugs^{**}	2 (0-8)	1 (0-7)	2 (0-8)	0.002^c

^a Chi square test, ^b Mann-Whitney U test, ^c Fisher's Exact test, ^{*} Mean ± Standard deviation, ^{**} Median (minimum-maximum), [†] There has been given more than one answer, ^{††} Percentages has been calculated for the number of people who have chronic disease diagnosis. HT, hypertension; DM, diabetes mellitus; CRF, chronic renal failure; Others, muscle skeletal system diseases, psychiatric disorders.

Table-2. The relationship between the risky drugs and age groups.

Risky drugs	Total n (%)	<65 age n (%)	≥65 age n (%)	p*
Psychotropic drugs	68 (30.4)	29 (27.9)	39 (32.5)	0.45
Anticoagulant drugs	85 (37.9)	33 (31.7)	52 (43.3)	0.74
Diuretic drugs	69 (30.8)	28 (26.9)	41 (34.2)	0.24
Antidiabetic drugs	62 (27.7)	22 (21.2)	40 (33.3)	0.04
Antihypertensive drugs	69 (30.8)	29 (27.9)	40 (33.3)	0.38
Antiarrhythmic drugs	25 (11.2)	5 (4.8)	20 (16.7)	0.005
Narcotic analgesic drugs	33 (14.7)	16 (15.4)	17 (14.2)	0.80

* Chi square test has been used.

Table-3. The relationship between age groups and Itaki fall risk scale scores.

	Aged <65 n (%)	Aged ≥65 n (%)	p
Fall risk, n (%)			0.038
Low Risk	12 (70.6)	5 (29.4)	
High Risk	92 (44.4)	115 (55.6)	

Table-4. The relationship of patients at high risk of falling with risk factors.

Risk factors	<65 yaş n (%)	≥65 yaş n (%)	p
Number of chronic diseases*	2 (0-5)	3 (0-6)	0.001^a
Presence of chronic diseases	80 (42.1)	110 (57.9)	0.024^b
Chronic diseases			
DM	24 (32)	51 (68)	0.007^b
HT	38 (31.4)	83 (68.6)	0.001^b
Heart disease	13 (25.5)	38 (74.5)	0.002^b
Neurological disease	8 (26.7)	22 (73.3)	0.03^b
Number of risky drugs	76 (44.2)	96 (55.8)	0.01^a

*The values were given as median (minimum-maximum). ^aMann-Whitney U Test; ^b Chi-square Test

According to the Itaki fall risk scale scores, 88.5% of the patients who were aged under 65 years and 95.8% of the patients who were aged 65 and above were considered in the high-risk group. A statistically significant difference was found between the two age groups in terms of fall risk according to the Itaki fall risk scale ($p = 0.038$) (Table-3).

When two age groups with high-risk of falling are compared; a statistically significant difference was found between the two age groups in terms

of the number of chronic diseases ($p = 0.001$), presence of DM ($p = 0.007$), HT ($p = 0.001$), heart disease ($p = 0.002$), neurological disease ($p = 0.03$), and number of risky drugs ($p = 0.01$) (Table-4).

A statistically significant difference was found between the two age groups in terms of consciousness open / not cooperative, visual impairment, need for physical support and chronic diseases (Table-5).

Table-5. The relationship between the risk factors in the Itaki fall risk scale and the age groups.

Risk Factors	<65 yaş n = 104	≥65 yaş n = 120	p
Consciousness open, not cooperative	2 (14.3)	12 (85.7)	0.013*
History of falls in the last month	3 (30)	7 (70)	0.35*
Vision			
Poor vision	11 (26.8)	30 (73.2)	0.005*
Visual impairment	2 (50)	2 (50)	1.00**
Need for physical support	9 (28.1)	23 (71.9)	0.02*
Urinary / Fecal incontinence	2 (28.6)	5 (71.4)	0.45*
Use of risky drugs in the last week	85 (45.2)	103 (54.8)	0.40*
Medical equipment maintenance			
Three and more	45 (45)	55 (55)	0.70*
Less than three	32 (50)	32 (50)	0.50*
Orthostatic hypotension	0	1	1.00*
Dizziness	0	3	0.25*
Loss of balance	10 (34.5)	19 (65.5)	0.17*
Use of more than four drugs	15 (44.1)	19 (55.9)	0.77*
Presence of chronic diseases	85 (42.5)	115 (57.5)	0.001*
Physical disability	1 (16.7)	5 (83.3)	0.22**

*Chi square test, **Fisher's Exact Test

DISCUSSION

Falls are a serious problem that increase mortality and morbidity and lead to a decrease in physical, psychological and social life satisfaction due to complications. Most of the factors that lead to falls can be prevented. Therefore, describing falls and identifying, eliminating or preventing risk factors would decrease the frequency of falling.

The literature indicates that falls are the most frequently observed in physical treatment and rehabilitation, internal diseases, geriatrics and neurology clinics (10, 15-17). In the studies conducted by Kerzman et al. (16), Krauss et al. (18) and Fischer et al. (19), among inpatients, the ages between 50-70 have been determined to be risky. The literature has also indicated the age of 65 and above to be a risk factor for falling (17, 18, 20-23). In a study conducted with a group of patients hospitalized in an internal diseases' clinic have found a statistically significant relationship between old age and fall risk (24) as we have found in our study. In a study conducted with inpatients from neurology and neurosurgery clinics have found that risk of falling is higher for

patients aged 60 and above than for patients below 60, even though the difference is not statistically significant (10). Coherent with this study, we have observed that the fall risk inpatients aged 65 and above is higher and found a statistically significant difference between the two age groups in their fall risk. Difference between the results can be explained by the characteristics of the patients included in the study and the scales used to measure fall risk.

When two genders are compared in terms of their fall risk, some studies have reported a difference while some studies have not (16, 25-31). Difference between the results can be explained with the difference in the proportion of each gender observed in the samples of the studies. In a study, it has been found that among a high-risk of falling inpatients, 56.7% are men (32). In our study, among patients at a high-risk of falling, 50.7% have found to be men. Apart from that, we have found that among the patients aged under 65, men have a higher risk of falling while among the patients aged 65 and above women have a higher risk of falling. However, there has not been found a statistically significant difference between the two age groups.

In a study, it has been found that while 13.7% of the inpatients have experienced 1-2 falls in the last three months; 1.5% have experienced 3 or more falls (32). In the literature, a history of falling is considered as a risk factor in fall risk assessments (17, 21, 33). It has also been found that 20.9% of the inpatients had a history of falling in the last three months and that there was a statistically significant relationship between the high risk of falling and a history of falling in the last three months (10). The same significant relationship has been found in other studies as well (34, 35). We have also found that 4.5% of our patients had a history of falling in the last month and no statistically significant relationship was found between the risk of falling and the history of falling in the last 1 month. The reason for this can be the Itaki fall risk scale asking whether a history of falling in the last month is one of the minor risk factors for falling or not. If it asked whether a history of falling in the last three months or a year rather than a month was one of the minor risk factors, then the results could have been different.

The presence of chronic diseases causes people to lose their moving abilities which creates a risk for falling (36, 37). Chronic diseases increase the risk of falling (13, 37, 38). Also, many studies have found a significant relationship between the presence of chronic diseases in older adults and a high-risk of falling (37, 39-40). We as well have found a statistically significant difference between the two age groups with a high risk of falling in terms of presence and number of chronic diseases.

The frequency of falls in patients with diabetes was 39% and it is observed the most in older adults (41). We have also found a statistically significant difference between the two age groups with a high risk of falling in terms of the presence of DM. It is indicated that the most frequent diagnosis the patients who fall get was hypertension (86%) (18, 25, 42). In our study, we as well have found that the most frequent diagnosis the patients got to be hypertension (55.8%) and that there is a statistically significant relationship between hypertension and a high risk of falling in the group aged 65 and above. The reason for that is thought to be the increasing frequency of incidence of hypertension in the patients with increasing age (43). Heart diseases which is observed frequently in older patients have also been indicated to be related with a high

risk of falling (37, 39). Coherent with this finding, we also have found a statistically significant difference between two age groups with high-risk of falling in the presence of heart diseases.

One of the common side effects of drugs is falls and there has been found a relationship between polypharmacy and falls (44). Kallin (21) and Reifkolh et al. (45) have indicated that use of four or more drugs increase the risk of falling. In some studies polypharmacy has shown to be related with falls (46, 47) while in other studies this relationship has not been observed (37). In our study, there has not been found a significant difference in use of four and more drugs and number of drugs between the two age groups with a high-risk of falling. However, when all the age groups were observed, an increase in the number of drugs used has been found to be related with an increase in the risk of falling. This result leads to the questioning of whether the number of drugs used by a patient influences the risk of falling regardless of age or not.

According to the results of a meta-analysis, it has been indicated that psychotropic drugs are related with the increase in the risk of falling, anticonvulsants and antiarrhythmic drugs can lead to an increase in the risk of falling, chronic use of antihypertension drugs are presumably not related with an increase in the risk of falling and cardiac and narcotic analgesic drugs are not related with an increase in the risk of falling (45, 48, 49). In our study, there was a significant difference in terms of number of high-risk drugs between the two age groups with a high-risk of falling. It has been found that the number of risky drugs used is higher in high risk patients aged 65 years and over. It has been found that the number of risky drugs used was higher inpatients aged 65 years and above with a high-risk of falling.

The using physical support for walking, and poor vision are considered as risk factors for falls in older adults (21). Coherent with this finding, we as well have found that poor vision and the using physical support for walking which both are risk factors have been observed more frequently in older patients in comparison to younger patients. In the literature, the presence of changes in the level of consciousness is also considered as the risk factor for falling (16, 17, 19, 50). We have found that the presence of changes in the level of consciousness which affects the risk of falling is

observed more frequently in the group aged 65 and above.

The limitations of the study include the various individuals who have administered the Itaki fall risk scale to the patients and the lack of sociodemographic data in the files of some patients.

CONCLUSION

As a consequence, with the assessment of the risk factors for falling in the patients aged under and above 65, some differences have been detected however, falls are an important problem in all age groups. Even though the risk of falling has been found to be higher in the group aged 65

and above, precautions for avoiding patients from falls must be taken carefully. Every hospitalized patient must be questioned about their risk factors for falls. Our study was carried out in order to determine the deficiencies in the precautions related to falls that will occur in the patients hospitalized in the internal medicine service and to contribute to the creation of protocols for preventing falls in the hospitals of the patients.

Conflict of Interest: The authors declare that there is no conflict of interest.

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