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ORIGINAL ARTICLE

Falls in Geriatric Cases

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Abstract

Introduction: The aim of this study is to examine the causes of falls and the clinical consequences of falling in elderly patients in fall-related emergency department admission.

Methods: This study was conducted retrospectively on patients aged 65 and over, presenting with a fall to Health Sciences University Haydarpaşa Numune Training and Research Hospital Emergency Medicine Clinic between 01.01.2019 and 01.08.2019. Data such as demographic characteristics of the patients, systemic diseases, drug use, reason for falling, place of fall, diagnosis in the hospital were determined and these data were analyzed comparatively with each other.

Results: Of the 443 patients aged 65 and over who applied to the emergency department due to falls, 246 patients who met the criteria were included in the study. One hundred forty-four (58.5%) of these patients were female. The mean age was 71.4+4.7 years. Of the patients, 104 (42.3%) fell indoors, 129 (52.4%) fell outside, and 13 (5.4%) fell on the stairs. One hundred and eighty-eight patients (77.7%) fell due to dizziness and loss of balance. Falls were more common in people with systemic disease (p=0.043). The most common diagnoses were soft tissue trauma (STT) (20.1%), fracture (14.7%) and head trauma (4.9%), respectively. There was a statistically significant correlation between the number of falls and age (p<0.001).

Discussion and Conclusion: It has been reported that the annual fall rate per capita in healthy people aged 65 and over is around 30-40%; this rate increases with age, and the biggest risk factor for falls is a previous fall history. Similarly, in this study, the annual fall rate was calculated as 31.7% and the rate of multiple falls as 11.4%. Evans et al. reported head trauma as the most common diagnosis of falling in this age group (26.8%). However, in our study, the diagnosis of soft tissue trauma was in the first place with a rate of 20.5%. The second most common diagnosis was fracture (14.7%). The reason for this difference may be that we consider soft tissue traumas as a separate category.

Keywords: Emergency department; fall; 65 years and older; fracture; clinical outcome

Conventionally, "elderly" has been defined as an age of 65 years old or older. Today, the elderly population is increasing in parallel with the rise in living standards, advances in technology and medicine. According to the United Nations reports, there are 617.1 million people aged 65 and over in the world in 2015, and this number constitutes 8.5% of the entire world population;and the elderly population will increase by more than 60% in 15 years, reaching 1 billion in 2030, constituting 12% of the total population [1]. In Turkey, the rate of elderly population has increased from 4.4% to 8% in the last 50 years [2].

With aging, body functions begin to deteriorate and the ability to adapt to environmental factors decreases. With increasing age, deterioration in walking, balance, vision,

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hearing and all other systems' functions occurs. In addition to these deteriorations, factors such as chronic diseases and drugs pave the way for falls [3]. In addition, due to age-related changes in the body, falls can easily cause injuries, loss of function and even death [4,5]. Koyuncu G et al.,[6] in a study they conducted in patients who did not describe balance disorder, found that there was a significant balance disorder and tendency to fall.

Fall can be defined as a person reaches a lower level than he or she is, without an internal event, such as syncope, or an external force, such as being pushed or hit by a car [7]. Falls are common in the elderly. In healthy people aged 65 and over, the annual fall rate per capita is around 30–40%, and this rate increases with age [8]. In a study conducted in the United States (USA), it was determined that 28.7% of individuals aged 65 and over fell in the last year. According to age groups, the fall rates in the last year was 26.7% in the population aged 65-74, 29.8% in the age group of 75-84, while it was reported as 36.5% in the elderly who are 85 and over [8,9].

2/3 of the deaths due to accidents in the elderly occur after falling [9]. Falls cause loss of mobility and independence in 20-30% of these individuals, and serious injuries in 10% [10]. Falls cause 10% of emergency service admissions and 6% of emergency hospitalization in persons 65 years of age and older, and 5-10% of these hospitalizations are due to fractures due to falling [11,12].

When the falls at home are examined, it is seen that environmental factors play a role in the majority of falls. Factors such as improperly placed items, thresholds, slippery floors (especially bathroom and toilet), poorly lit environment and use of inappropriate shoes are among the leading causes of falls in the elderly [12]. Studies show that the majority of homes have internal risks and these factors increase the risk of falling by 3-4 times [13,14].

Falls in the elderly cause more mortality and morbidity, as well as a decrease in general functions, preventing the elderly from living an independent life. This situation requires long-term care and increases the risk of premature death [15].

In a study conducted in the USA, the most common diagnoses related to falls in the population aged 65 and over were head trauma (26.8%), rib fractures (8.5%), spinal cord injuries (7.7%), upper extremity fractures (5.5%) and lower extremity fractures (2.9%), respectively [16]. In a study examining the clinical status of patients aged 65 and over who applied to the emergency department due to falls in our country, it was found that the most common reason for falling was tripping, and the rate of fractures due to falling increased with age [17].

Objective

The aim of this study is to examine the demographic characteristics, causes of falls, frequency of falls, systemic diseases, systemic drug use, habits, and clinical outcomes related to falls in patients aged 65 and over who applied to the emergency department due to falling.

Materials and Methods

This study was conducted retrospectively on patients, presenting with a fall to Health Sciences University Haydarpaşa Numune Training and Research Hospital Emergency Medicine Clinic in a 8-month period between 01.01.2019 and 01.08.2019, who met the inclusion critertia.

The data of the patients were obtained by using the ICD 10 diagnostic coding system. Demographic data of the patient, reason for falling, clinical findings, diagnosis, history of systemic disease, drug use, and smoking habits were noted in the pre-prepared data collection form. The existence of a condition such as tripping and dizziness that may have caused the fall was questioned. In addition, diagnoses such as fracture due to falling and hospitalization or discharge status of the patient were noted.

The participants who were included in the study were 65 years of age or older, reported that the incident happened indoors, outdoors or on the stairs, had sufficient medical records, with no external force such as an accident involved, and the reason for the fall was not due to a cause such as acute coronary syndrome (ACS), hypoglycemia, cerebrovascular accident (CVA), in whom the cause of the fall could be clearly explained by themselves or the person next to them and who did not develop cardiac arrest during emergency admission were included. and who did not develop cardiac arrest at the time of emergency admission.

Patients under the age of sixty-five, those who fell due to an external force such as being pushed by someone else, patients whose fall was due to a reason such as CVA or ACS, patients who stayed outside of their home such as a nursing home, and patients who developed cardiac arrest during emergency admission were excluded from the study. In addition, the patients with missing data were not included in the study.

The data of the cases included in the study were entered into the SPSS program and were analyzed comparatively. Descriptive statistics were used for continuous variables (mean, standard deviation, minimum, median, maximum). The comparison of independent and normally distributed more than two continuous variables was made with the Kruskal-Wallis test, and the comparison of two indepen-

dent and normally distributed variables was made with the Mann-Whitney U test. Statistical significance level was determined as 0.05. MedCalc Statistical Software version 12.7.7 (MedCalc Software bvba, Ostend, Belgium; http://www.medcalc.org; 2013) was used in analyzes.

Results

A total of 443 patients aged 65 and over applied to the Health Sciences University Haydarpaşa Numune Training and Research Hospital Emergency Medicine Clinic due to falling indoors, outdoors and on the stairs in the 8-month period between 01.01.2019 and 01.08.2019. It was determined that 28 patients lived outside the home such as a nursing home, 67 patients fell due to a condition such as CVA or ACS, 54 patients had insufficient medical records, and 48 patients died as a result of accident. As a result, a total of 197 patients were excluded from the study and 246 patients who met the criteria were included in the study.

One hundred forty-four (58.5%) of the patients included in the study were female. The mean age was 71.4+4.7 years (range: 65-90). There was no statistically significant difference in the number of falls between men and women (Student t p=0.552). One hundred eighty-seven (76%) of the patients fell between 06.00 and 18.00, which we considered as daytime hours. Others had fallen at night. One hundred four (42.3%) of the patients gave a history of falling indoors, 129 (52.4%) outdoors, and 13 (5.4%) on the stairs. When the hospitalization rates were examined according to the location of falling, it was found that the hospitalization rate was 21.2% for the patients who fell indoors, 30.2% for those who fell outdoors, and 30.8% for those who fell on the stairs. There was no statistically significant correlation between hospitalization rates according to the location of fall (Chi-square p=0.276).

Considering the habits of the patients, 68 patients (27.9%) were regular smokers. Ten patients (4.1%) were drinking alcohol regularly. No correlation was found between these habits and the frequency of falls and the diagnosis they received.

One hundred and sixty patients (66%) had a history of at least one systemic disease. 62.8% of the patients were using at least one systemic drug. Falls were more common in patients with systemic disease, which was statistically significant (p=0.043). Similarly, as the number of drug use increased, the number of falls also increased in parallel (Kruskal-Wallis p=0.002).

In the last year, 78 patients (31.7%) gave a history of at least one fall. Twenty-eight patients (11.4%) stated that they fell more than once. When the age of the patients who stated that they fell at least once was analyzed, there were 42 patients (22.1%) between 65-74, 32 patients between 75-84 (62.7%), and 4 patients (100%) aged 85 and over. There was a statistically significant correlation between the number of falls and age (p<0.001).

When looking at the cause of falling according to the falling location, the most important reason for falling on the stairs (46.2%) was tripping. Dizziness and inability to maintain balance (77.7%) were the most common causes of falls in patients who fell indoors and outdoors (p<0.001).

When the clinical diagnoses due to falls were examined, 49 (20.1%) of the cases had STT and 23 (19.5%) had more severe clinical outcomes such as fractures and head trauma. Fracture stood out as the second most common diagnosis after STT. Fractures were detected in 35 patients (14.7%) in total. Fractures were extremity fractures in 15 (6.1%) patients, hip fractures in 10 (4.1%) patients, rib fractures in 8 (3.3%) patients, and vertebral fractures in 3 (1.2%) patients. The third most common diagnosis due to falling was head trauma in 12 patients (4.9%).

The rate of being diagnosed with fractures in patients with a history of falling at least once in the last year was statistically significantly higher than those without a fall history (32.3% vs 9.8%) chi-square=6.78, p=0.009).

In falls indoors, the section where the fall occurred was analyzed by dividing into two groups, as those who fell in the wet parts of the house (kitchen and bathroom) and those who fell in other parts of the house. Sixty-two of the patients (59.6%) fell in the wet sections, and 42 of the patients (40.4%) fell in the other sections.

As a result, 177 patients (72%) were discharged, 65 patients (26.4%) were hospitalized, 4 patients (1.6%) were transferred to be operated directly from the emergency department.

Discussion

Falling is a common condition in the elderly [6,7]. It has been reported that the annual fall rate per capita is around 30-40% in healthy people aged 65 and over, and this rate increases with age [6,7]. In a study conducted in the USA, it was reported that 28.7% of individuals aged 65 and over fell in the last year [8,9]. Patel et al., [18] on the other hand, stated that one out of every three elderly people fell every year, and that the biggest risk factor for falling is a previous history of falling. In a study conducted in our country, the frequency of falls in people over 65 years of age was found to be 26.7%-33.3% in the last year [22]. In our study of 246 patients, similarly, we found that 78 patients (31.7%) fell at

least once and 28 patients (11.4%) fell more than once in the last year.

In the literature, female gender, visual impairment and loss of proprioception in the lower extremities have been associated with especially recurrent falls. There are studies reporting that balance problems are more common in women than men, and therefore falls are more common in women [6,21]. In our study, although falls were more common in women, no statistically significant difference was found between the two sexes.

In the studies performed, it is reported that fall rates in the last one year according to age groups was 26.7% in the 65-74 age group, 29.8% in the 75-84 age group, and 36.5% in the 85-year-old group [8,9]. When the age of the patients who stated that they fell at least once in our study was examined, it was seen that 22.1% of the patients were between 65-74, 62.7% were between 75-84 and 100% were 85 years old and over. In our study, although the rates of falls between the ages of 65-74 seem consistent with the literature, the rates of falls between the ages of 75-84 were found to be higher. There were only 4 patients aged 85 and older. All of these patients described more than one fall in the past year. Since the number of patients in this age group is only 4, this number is not sufficient to make a general assessment.

Evans et al., [16] reported the most common diagnoses due to falls in the population aged 65 and over as head trauma (26.8%), rib fractures (8.5%), spinal cord injuries (7.7%), upper extremity fractures (5.5%), and lower extremity fractures (2.9%). In our study, fracture rate was 14.7%. The most common fractures were extremity fracture with a rate of 6.1%, 4.1% hip fracture, 3.3% rib fracture and 1.2% vertebral fracture. Head trauma was seen with a rate of 12%. The reason for this difference may be that we consider soft tissue traumas as a separate category.

Patel et al. [18] reported that eliminating visual problems, physical exercises including supporting balance, strength increase and walking exercises, and minimizing sedating drugs greatly reduced the risk of falling. In a systematic review, data was presented that muscle-strengthening and balancing exercises, discontinuation of psychotropic drugs, and cardiac pacemaker implantation when necessary, definitely reduced the risk of falling [19]. In our study, we found that there was a statistically significant correlation between the presence of systemic disease and systemic drug use and falling. Therefore, it is extremely important to keep the systemic diseases and medication intake under strict control in order to reduce the risk of falling.

It has been reported in many studies that there is a high risk of falling in parts that are considered as wet parts of the house, such as bathrooms and toilets [17,20]. These findings are largely consistent with those in our study.

Conclusion

With aging, body functions begin to deteriorate and the ability to adapt to environmental factors decreases. In addition, due to age-related physiological changes in the body, falls can easily cause injuries, loss of function and death. In this study, we found that the risk of falling and the probability of falling again increase with age, and that the probability of developing important clinical outcomes such as fractures increases significantly in recurrent falls. In addition, we have seen that the presence of systemic disease and regular drug use increase the probability of falling, and dizziness and loss of balance indoors and outdoors, and tripping on stairs are the most common causes of falling.

Ethics Committee Approval: This study was conducted retrospectively on patients, presenting with a fall to Health Sciences University Haydarpaşa Numune Training and Research Hospital Emergency Medicine Clinic in a 8-month period between 01.01.2019 and 01.08.2019, who met the inclusion critertia.

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