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Research Article

Social Determinants of Hip Fractures in Elderly Patients–A Case-Control Study

Mumin Karahan[1], Mehmet Sah Sakci[2]

[1]Kafkas University, Faculty of Medicine, Department of Orthopedics and Traumatology, Kars, Türkiye
[2]Batman Training and Research Hospital, Department of Orthopedics and Traumatology, Batman, Türkiye

Abstract

Aim: Hip fractures are common orthopedic traumas and are known as a problem in terms of public health, particularly among the elderly. Preventing fractures and determining risk factors are critical in reducing morbidity, mortality, and social and economic burden. The purpose of this study was to examine the social determinants affecting hip fractures.

Material and Methods: This case-control study was conducted with a case group of 108 (36.1%) patients and a control group of 191 (63.9%). Hip fracture status was selected as the dependent variable in the study. The independent variables were marital status, place of residence, single-story or multi-story residence, use of stairs, use of assistive devices, cohabitants, working status, chronic disease status, education status, fixed income status, health insurance, family history of hip fractures, fractures in the last five years, getting help in daily work, smoking, fear of falling, and perception of general health status.

Results: Marital status, cohabitants, chronic disease status, having a fixed income, having health insurance, fear of falling, and perception of general health differed to a significant extent between the case and control groups. Nonetheless, no statistically significant difference was found between the groups regarding their places of residence, living in whether single-story or multi-story residences, the use of stairs, assistive device usage, active employment status, education status, family history of hip fractures, fractures in the last five years, getting help in daily work, and smoking.

Conclusion: Social factors affect the risk of hip fracture. Clinicians should be alert to the importance of this issue and raise the awareness of elderly patients.

Keywords: Hip fractures; orthopedics; risk factors; social determinants; elderly patients

INTRODUCTION

Hip fractures, a global public health problem, are generally seen in the elderly and have gained more importance with the increasing average age expectation of society with the advancing medical developments. Hip fractures include neck, trochanteric, and subtrochanteric regions proximal to the femur. While it is predicted to affect approximately 18% of women and 6% of men, the number of hip fractures, which was 1.66 million in 1990, is expected to reach 6.26 million in 2050 (1,2). Ninety percent of hip fractures cases in the geriatric population occur after a simple fall (3). The incidence of these fractures, often a consequence of low-energy trauma, increases with age. It constitutes approximately 20% of the workload in orthopedic traumas (4). Studies on risk factors have shown that factors such as racial differences, gender, decrease in bone mass and related fracture history, low activity, family history of hip fracture, smoking, and corticosteroid use increase the risk (5,6). In addition, patients may have substantial comorbidities and impaired cognitive functions (7). Hip fractures are usually treated surgically to return to daily life early and experience minimal complications, except for patients with poor general condition who cannot handle anesthesia. Nevertheless, hip fractures cause severe morbidity and mortality (8). Post-surgical mortality increases even more among patients with comorbidities. It was shown that the mortality after fracture rises to 20-

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Corresponding Author: Mumin Karahan, Kafkas University, Faculty of Medicine, Department of Orthopedics and Traumatology, Kars, Türkiye
E-mail: karahanli_190@hotmail.com

24%; 40% of the patients cannot walk unaided, 60% need help, and 33% are entirely dependent (9). Patients who have experienced hip fractures have a doubled likelihood of mortality within one year following the development of these fractures development compared to age-matched control groups (10).

Treatments developed in recent years to prevent osteoporosis and treat age-related diseases, reduced body mass index, healthier elderly populations, improved functional ability, and various fall prevention measures have contributed to reducing the incidence of age-related hip fractures (11). Despite this, medical, psychosocial, and mechanical complications cause hospitalization, treatment process prolongation, and rehabilitation delay. The long treatment, care, and rehabilitation process puts a severe economic burden on the patients' families and the countries' health systems. Due to all these effects, studies are carried out on hip fracture prevention, treatment, postoperative care, and rehabilitation processes. In the present study, that researchers aimed to identify the risk factors associated with hip fractures among patients who are older than 65 years old. Since studies on the social determinants of hip fractures are limited, this study is expected to make a contribution to the relevant literature.

MATERIAL AND METHOD

This case-control study was carried out at Kafkas University Faculty of Medicine Hospital Hospital Orthopedics and Traumatology Clinic. The case group consisted of patients over 65 with a history of hip fractures. Those with no history of hip fracture at a similar age were selected for the control group. The control group was formed for each case at a ratio of 1:2. The sample of this study excluded individuals younger than 65 years old, those staying in a nursing home, and those who refused to participate. One hundred and ninety-one (63.9%) people in the control group and 108 (36.1%) in the case group were reached. The study was performed using a data collection form created by screening the literature. The form was administered in person to the patients in both groups.

The study's independent variables are marital status, place of residence, single-story or multi-story residence, use of ladders, use of assistive devices, cohabitants, active working status, presence of chronic disease, education, fixed income, health insurance, first-degree hip fracture history, any fracture in the last five years, assistance in daily work, smoking, fear of falling, and perception of general health status. The ethics of the study were obtained from the Ethics Committee of the Faculty of Medicine of Kafkas University with the protocol number 80576354-050-99/244 on 23/11/2021. Both verbal and written (informed consent) consent was obtained from the study participants. The study was conducted per the Declaration of Helsinki.

Data were analyzed using the SPSS version 21.0 program (IBM Corp. Armonk, NY, USA). Descriptive statistics were evaluated as frequency and percentage values, and the categorical variables were analyzed using the Chi-squared test. Numeric variables were tested for normality assumptions using the Kolmogorov-Smirnov test. Median, largest, and smallest values, and 1st and 3rd quartiles and variables were evaluated. The Mann Whitney U test was applied to analyze the significance of differences between two groups of numeric variables. The statistical significance value was taken as 0.05.

RESULTS

In the study, there were 108 (36.1%) people in the case group and 191 (63.9%) in the control group (Table 1). The median age, 1st and 3rd quartile values, and the largest and smallest values in the case and control group patients were determined as 76 (71-81.50) (min 66-max 92) and 75 (71-81) (min 66-max 95). When the median ages of the patients in the two groups were examined, they had no statistically significant difference (p=0.568). In addition, when the two groups were analyzed in terms of their gender distributions, no statistically significant difference was revealed (p=0.315). Therefore, case and control groups were matched in age and gender.

While the rate of widowed and unmarried was 41.7% in the case group, it was 24.1% in this control group. A statistically significant difference was identified between the marital status distributions of the case and control groups (p=0.002). When the place of residence, type of house, use of stairs, and use of assistive devices were examined, no significant variation was observed between the participants in the two groups (p=0.162; p=0.938; p=0.480; p=0.372, respectively). While the rate of those living alone in the case group was 8.3%, it was 4.7% in the control group. In the examination of the patients in the two groups regarding the people they lived with, a significant difference was found (p =0.002). While the presence of chronic disease was 63.9% in the case group, it was 46.1% in the control group, and this difference was found significant (p=0.003). While the rate of those with fixed income was 79.6% in the case group, this rate was 88.0% in the control group, and this difference was significant (p=0.047). While the rate of those with health insurance in the case group was 79.6%, it was 88.5% in the control group; this result revealed a statistically significant difference between the groups (p=0.038). While the rate of those with a fear of falling was 50.0% in the case group, this rate was 34.0 in the control group, and this difference was statistically significant (p=0.007). When people were asked how they found their general health status, the rate of those who expressed themselves as bad in the case group was 33.3%, while this rate was 19.9 in the control group. According to the analysis outcomes, this difference was statistically significant (p=0.003). No significant difference was determined between the two groups when the participants were examined regarding active employment status, education status, presence of a hip fracture near the first degree, fracture in the last five years, getting help in daily work, and smoking.

DISCUSSION

Risk factors of hip fractures, which become more critical with increasing aging, are also being investigated in all

aspects. Among these, social, cultural, and economic determinants are essential. In addition, the relationship between patient-specific factors such as comorbidity, familial conditions, and smoking with hip fractures has recently increased its importance. In our study, significant differences were found between the case group and the control group in terms of some determinants. Marital status, cohabitation, chronic disease status, having a stable income, having health insurance, fear of falling and general health perception were significantly different between the case and control groups.

Men and women are complementary to each other. Especially in old age, supporting each other physically, mentally, and socially is essential. Therefore, marital status is vital in terms of health. Previous studies have shown the relationship between marital status as a social determinant and hip fracture risk. In this study, the marital status category of widowed and single women was significantly more frequently found in the case group. In a study conducted in Sweden, the risk of hip fracture was lower in married women (12). A similar study reported that marital status was related to the risk of hip fracture, and hip fracture was less common in married people (13). Marital status may also affect the mean age of hip fracture (14). Considering the cultural norms in the region where the study was conducted, people generally live with their spouses and children. Therefore, the number of patients living alone in the study was small. However, the rate of living alone in the case group was significantly greater than the rate identified in the control group. A previous study demonstrated that living alone is related to an elevated risk of hip fracture (13). At the same time, living alone increases mortality after hip fracture (15).

When the places where the patients lived were evaluated, while those living in rural areas were more frequently encountered in the control group, those living in urban areas were more prevalent among the patients in the case group. However, these differences were insignificant. In a study by Okubo et al., the relationship between hip fracture and urban and rural settlements was evaluated. No difference was found in men, but an increase in the femoral neck and trochanteric fractures was observed at specific age ranges in women living in urban areas (16). Likewise, a systematic review evaluating the relationship between place of residence and hip fracture showed that the risk of hip fracture in rural areas is lower than in urban areas (17). Ladder usage and multi-story homes can pose a risk for hip fractures. Therefore, making a bar to hold onto the sides is essential. In addition, it is helpful to consider factors such as slippery floors, electronic equipment cables, and the placement of furniture that will tend to fall in the house. The study questioned the type of house and the use of stairs among the participants in the two groups. In both the case and control groups, the proportion of those living in a one-story house and those who did not use ladders was higher and similar. This finding may be explained by the geographical and architectural characteristics of the region where the study was conducted. Ladders were shown to cause hip fractures in the home (18).

Assistive device use rates were found comparable between the two groups of patients. Patients using assistive devices were more common than those who did not in both groups. Stolee et al. reported using assistive devices and unbalanced gait as risk factors for hip fracture (19). Most patients in the two groups were not actively working. When the patients who received help in their daily work were questioned, no significant variation was detected between the groups. A large majority of patients did not receive assistance in their daily work. Smoking is a considerable risk factor for healing and complications before and after hip fracture (20, 21). In the study, it was seen that there was no significant difference between the two groups. The patients were questioned about any fracture history within the last five years and hip fracture history in their first-degree relatives. No significant difference was observed between the groups. A study by Kanis stated that having a family history of hip fracture increases the risk (22). The same study showed that hip fracture risks rise after a fracture in any part of the body. It was reported that this risk increases most after hip and spine fractures. The relationship between hip fractures and chronic diseases has been investigated in the past. Many diseases, such as cognitive disorders, osteoporosis, diseases that impair gait (Parkinson's, vertigo, etc.), malnutrition, morbid obesity, etc., increase the risk of hip fracture (19,22,23). Consistent with the literature, the presence of chronic diseases was encountered at a significantly higher rate in the patients in the case group.

Hip fractures mainly occur after a fall. Therefore, it is estimated that the fear of falling, which was determined to be at a significantly higher rate in the case group, is an expected result. Anxiety in patients may also affect this (24). Fear of falling may cause patients to move less and increase morbidities such as muscle wasting and thromboembolism. It can also increase the use of assistive devices and prolong the rehabilitation process. When it was questioned how the patients evaluated their general health status, a significantly higher rate of the patients with hip fractures described their health status as poor compared to those in the control group. This may be related to the post-traumatic psychology of the patients. A hip fracture can affect patients' physical, social, and emotional functions (25).

Economic competence and educational status are social factors that affect human health. Relationships between these determinants and hip fracture are evaluated. It was reported that individuals with higher education have a lower risk of hip fracture than those with lower education (13). This study showed no statistically significant difference between the education level distributions of the two groups. Those with fixed income and health insurance were significantly higher in the control group. On the other hand, the prevalence of these parameters was also relatively high in the case group. This situation

may be related to the social and economic opportunities of the region where the study was conducted. It was reported that those with good economic status have a lower incidence of hip fractures and a relationship with a hip fracture at older ages (14).

The limitation of this study is that its outcomes cannot be generalized to the general population as it is a case-control study. In addition, the answers given by the participants may have been affected by the memory factor.

CONCLUSION

In conclusion, social determinants are important as risk factors in hip fractures. Social determinants are like iceberg phenomenon in the risk factors of hip fractures. Therefore, clinicians should raise awareness of vulnerable patients about hip fractures in this age population.

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