RESEARCH ARTICLE

Investigation of the History of Distal Radius Fractures in Patients Over 55 Years Old Suffering from Hip Fractures

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Abstract

Objectives: This study aimed to examine the incidence of distal radius fractures in patients aged 55 and above who had also experienced hip fractures. Osteoporosis-associated fractures, particularly hip fractures, are common and serious in older individuals with reduced bone density. Previous research has suggested a relationship between hip fractures and distal radius fractures.

Methods: The study included patients over 55 years old who had presented with hip fractures at Akhtar Hospital in the past five years. Patients with a history of hip fractures more than five years before experiencing the distal radius fracture were excluded. Personal information was extracted from medical records, and the collected data were analyzed in SPSS software using statistical methods, such as t-tests and paired t-tests.

Results: This study involved 1,745 patients with hip fractures and 183 individuals without fractures. The average age of the patients was 75.8±10.4 years old, with the majority being female (59.6%). Among the hip fractures, 59.6%, 34.5%, and 5.9% were intertrochanteric fractures, neck of femur fractures, and subtrochanteric fractures, respectively. Overall, 15.8% of individuals with hip fractures also had distal radius fractures. The average age and gender distribution of the patients were similar in both groups, with no significant difference. However, the prevalence of distal radius fractures was significantly higher in the hip fracture group, compared to the control group.

Conclusion: It was found that individuals over the age of 55 with distal radius fractures, especially females, are more susceptible to hip fractures. Distal radius fractures have a significant impact on the occurrence of hip fractures in patients. Therefore, older individuals with osteoporosis should be cautious and avoid high-risk activities that could lead to falls and fractures.

Level of evidence: III

Keywords: Distal radius fracture, Hip, Hip fracture, Osteoporosis, Radius

Introduction

Fractures and dislocations involving the hip joint and its surrounding areas are common reasons why patients seek orthopedic clinics and emergency departments.[1] these fractures typically occur in young individuals following severe trauma and older individuals following minor trauma. In fact, over 86% of hip fractures occur in individuals over 65 years of age, and these fractures are increasing globally.[2]

Hip fractures are significant causes of morbidity and mortality among older individuals, with reported rates ranging from 14% to 36%.[3,4] An investigation found that the mortality rate within the first year following a hip fracture is 20%, compared to a mortality rate of 0.9% in other orthopedic conditions.[5,6] Hip fractures are also the leading cause of hospitalization in orthopedic departments, with approximately 20% of orthopedic beds allocated to hip fracture patients in many countries.[7] Additionally, only 54% of patients hospitalized for hip fractures are able to walk independently one year after surgery.[8] These fractures often occur due to a combination of bone fragility and falling

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to the ground.[9] Risk factors associated with fractures include advanced age, gender, previous fracture history, hyperthyroidism, diabetes mellitus, antibiotic use, high caffeine consumption, living alone, corticosteroid treatment, renal insufficiency, and liver diseases.[10]

On average, patients with hip fractures are over 80 years old, and the majority of them (80%) are female.[9] Elderly individuals with hip fractures often have coexisting conditions, particularly heart diseases, and require medications for heart and blood pressure management. Risk factors shared between heart failure and hip fractures include smoking, low levels of 25-hydroxyvitamin D, thiazide diuretics, aldactone, angiotensin-converting enzyme inhibitors, and beta-blockers.[11]

It is clear that hip fractures in older and middle-aged individuals primarily result from decreased bone resistance, especially in the context of osteoporosis.[12] among fractures related to osteoporosis, hip fractures are known for their higher morbidity, mortality rates, and substantial healthcare costs.[13] Incidence of hip fractures has been increasing among both males and females in recent years.[14]

Previous studies have shown an association between hip fractures and distal radius fractures.[13] Distal radius fractures, which occur due to minor trauma, are also associated with osteoporosis.[12] Therefore, distal radius fractures can serve as a predictive factor for future hip fractures.[15] Implementation of preventive measures to treat osteoporosis and prevent its progression has been shown to effectively reduce the occurrence of subsequent hip fractures.[15] However, it is crucial to identify the at-risk population and establish a relationship between these fracture types in order to achieve this goal.[12] In this regard, the objective of this study was to examine the history of distal radius fractures in patients over 55 years of age who experienced hip fractures.

Materials and Methods

This study included 1,754 patients aged 55 and above who were admitted to Akhtar Hospital, Tehran, Iran with hip fractures (inter-trochanteric and femoral neck fractures) in the past five years. It should be mentioned that the patients who had a prior history of hip fracture before the distal radius fracture were excluded from the study.

Demographic information, such as age, gender, distal radius fracture, and type of hip fracture, was extracted from the medical records of patients. Informed consent was obtained from all patients and there were no additional costs imposed on them. A routine treatment protocol was followed for all patients. The researchers adhered to the principles outlined in the Helsinki Declaration throughout the research.

The data was analyzed in SPSS software (version 22) using descriptive statistics (mean and standard deviation for quantitative data, count and percentage for qualitative data). The significance level for all tests was set at $P < 0.05$.

Results

In this study, a total of 1,745 patients with hip fractures and 183 normal individuals were examined. The patients with hip fractures had an average age of 75.8 years (ranging from 55 to 105 years). Regarding gender, 744 of these patients were male (42.4%) and 1,010 were female (57.6%). Specifically, among the hip fracture patients, 1,045 (59.6%), 605 (34.5%), and 104 (5.9%) individuals had intertrochanteric fractures, neck of femur fractures, and subtrochanteric fractures, respectively. Furthermore, it was found that 277 individuals (15.8%) with hip fractures also had distal radius fractures. The frequency of distal radius fractures among patients with different types of hip fractures is depicted in [Figure 1].

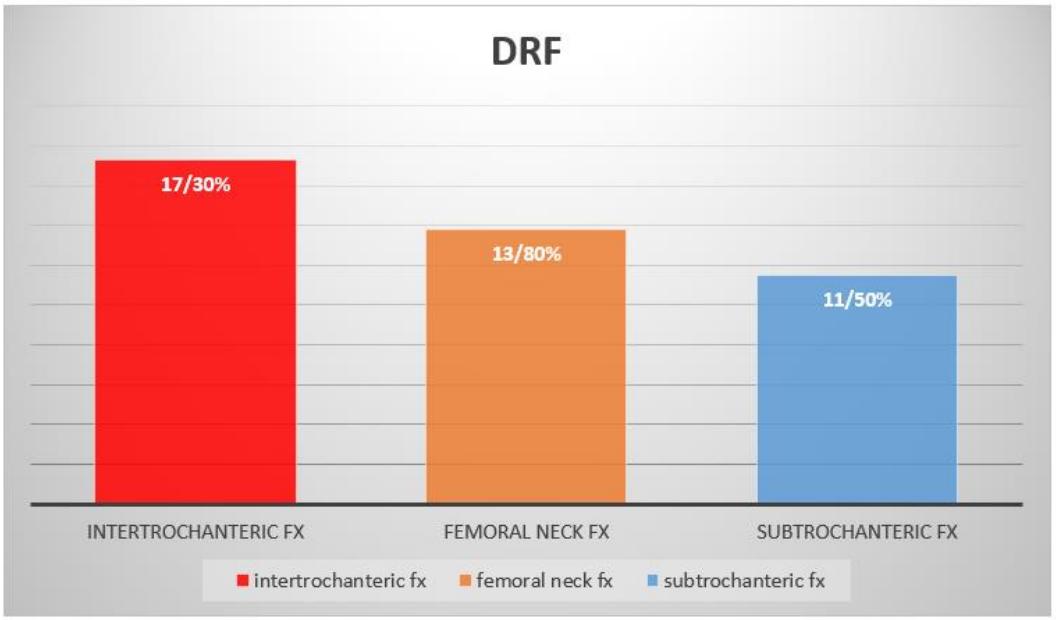

Figure 1. Frequency of distal radius fractures among patients with different types of hip fractures

The control group had an average age of 73.7 years (ranging from 52 to 96 years) and consisted of 85 male (46.4%) and 98 female (53.6%) participants. Additionally, five individuals (2.7%) in the control group had a history of distal radius fractures. A comparison of the average age, gender distribution, and prevalence of distal radius fractures between patients with hip fractures and the control group is presented in [Table 1]. As observed, there were no significant differences in terms of average age and gender distribution between the two groups. The average age and gender distribution were statistically similar in both groups, with no significant difference. However, the prevalence of distal radius fractures was significantly higher in the hip fracture group, compared to the control group.

Table 1. Comparison of the average age, gender distribution, and prevalence of distal radius fractures between patients with hip fractures and the control group

Variable		Hip fracture	Control	*P* value
Age		10.4±75.8 (105-55)	10.2±74.7 (102-54)	0.144
Gender	Male	42.4%	46.4%	0.294
	Female	57.6%	53.6%	
DRF		18.8%	2.7%	<0.001

DRF: distal radius fracture

Discussion

This study aimed to investigate the history of distal radius fractures in patients over the age of 55 years who had also experienced hip fractures. The study assessed the type of hip fractures in these patients and compared their average age and gender distribution to individuals in the control group.

In terms of demographic variables, the average age of patients with hip fractures was 75.8 ± 10.4 years, ranging from 55 to 105 years. According to similar studies performed by Sadeghpour et al. and Geltach et al., patients with hip fractures were generally older adults and the elderly.[16,17] This may be due to the decrease in bone density that occurs with age, potentially indicating osteoporosis.[6]

Additionally, among the patients, 744 were male (42.4%) and 1,010 were female (57.6%). In a similar study conducted by Anguin et al., it was found that individuals with hip fractures were predominantly female, with osteoporosis being a contributing factor.[18] This higher prevalence of fractures and osteoporosis in females can be attributed to the onset of menopause, which significantly decreases bone density.[19] The most common type of hip fracture observed in this study was intertrochanteric fractures, aligning with findings from a similar study conducted by Yoon BH et al.[20]

In the present study, it was observed that a total of 277 individuals (15.8%) with hip fractures also had distal radius fractures. Moreover, the prevalence of distal radius fractures was significantly higher in the hip fracture group, compared to the control group. Chen CW et al. reported similar findings, stating that patients with distal radius fractures had a higher risk of developing hip fractures within one year, especially within the first month after the distal radius fracture.[21] Other studies have also indicated that distal radius fractures can be predictive of subsequent fractures, such as hip fractures, in elderly individuals with osteoporosis.[22,23]

A retrospective study conducted by Owen et al. analyzed 394 patients aged over 35 who had distal radius fractures between 1945 and 1959. The objective was to explore the connection between distal radius fractures and hip fractures later in life. They found that 7 male and 47 female patients developed hip fractures. They concluded that minor trauma resulting in distal radius fractures is associated with an increased risk of hip fractures. However, this increased risk was not observed in individuals under the age of 70. Interestingly, men with distal radius fractures were found to be six times more likely to develop hip fractures, compared to the general population. The aforementioned study highlights the importance of assessing and treating osteoporosis in individuals with distal radius fractures.[15]

Another retrospective study carried out by Daruwalla et al. focused on 572 patients aged over 60 years who had experienced hip fractures. The researchers investigated the history of distal radius fractures in these patients during the 10 years that led to their hip fractures. They found that 5% of the hip fracture patients had a prior history of distal radius fractures, with a higher prevalence among women. They concluded that distal radius fractures could be considered a risk factor for future hip fractures, emphasizing the need for the evaluation and management

of osteoporosis.[13]

Lauritzen et al. conducted a 10-year follow-up study from 1984 to 1996 on females who had experienced either distal radius fractures (1,735 patients) or proximal humerus fractures (747 patients). They examined the occurrence of hip fractures in these females and discovered that those with a history of distal radius fractures had a 9.1 times higher risk of hip fractures if they were within the age range of 60-79 years old. The above-mentioned research underscores the heightened vulnerability of elderly females to subsequent hip fractures following distal radius fractures, emphasizing the importance of education, as well as evaluation, and management of osteoporosis.[24]

In a study performed by Hans Mallmin et al., 1,338 patients who had distal radius fractures between 1968 and 1972 were followed up for 24 years to assess the occurrence of hip fractures. The findings revealed that both male and female individuals who had previously experienced distal radius fractures had an increased susceptibility to subsequent hip fractures. The projected risk was 54.1% for females and 27.2% for males.[14]

Conclusion

Based on the present study, it was discovered that individuals aged 55 and above who experience distal radius fractures, especially females, are at a higher risk of hip fractures. Occurrence of hip fractures in patients is greatly influenced by distal radius fractures. As a result, older individuals with osteoporosis should exercise caution and avoid participation in activities that increase the risk of falls and fractures. It is crucial to enhance clinical intervention to effectively treat osteoporosis and reduce bone density loss among the elderly population.

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