ACTA
ORTHOPAEDICA
et
TRAUMATOLOGICA
TURCICA

Author's translation
Acta Orthop Traumatol Turc 2005;39(4):295-299

Risk factors for osteoporosis in women having hip fractures after 60 years of age

Kalça kırıklı 60 yaş üstü kadınlarda osteoporoz risk faktörleri

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Amaç: Yaşlı kadınlarda kalça bölgesi kırıklarına yaklaşım sadece kırık sonrası yapılacak cerrahi girişim ve rehabilitasyon ile sınırlı kalmamalı, hastayı kırıktan koruyucu girişim ve önlemleri de içermelidir. Kliniğimizde kalça kırığı geçirmiş kadın hastalarda kırık risk faktörlerini ve sosyal profillerini ortaya koymak için bir anket çalışması yapıldı.

Çalışma planı: Kalça kırığı nedeniyle yatırılan 60 yaş üstü 107 kadın hastaya (ort. yaş 74; dağılım 63-100), fiziksel ve sosyal özellikleri, tıbbi durumları ve geçmişleri, beslenme alışkanlıklarına yönelik bir anket uygulandı. Ayrıca, kalça grafilerinden kırık tiplemesi ve Singh indeksi belirlendi. Femur boynu kırıklarında Garden, intertrokanterik kırıklarda modifiye Evans sınıflaması kullanıldı. Elli bir hastada (%47.7) femur boynu kırığı, 56'sında (%52.3) intertrokanterik kırık vardı.

Sonuçlar: Vücut kütle indeksi ortalaması 23 kg/m^2 bulundu. Singh indeksi hastaların %70.1'inde grade 3, %26.2'sinde grade 2, %2.8'inde grade 4, %0.9'unda grade 1 idi. Kırk dört hastanın (%41.1) okuma-yazması yoktu; 31 hasta (%29) okuryazar ya da ilkokul mezunu idi; %29.9'unda ortalama 30.7 yıl sigara içme öyküsü vardı. Hastaların %67.3'ü sınırlı hareket eden kişilerdi; %63.6'sı ise daha önce herhangi bir işte çalışmamıştı. Düzenli spor yapan hasta yoktu. Sadece iki hasta (%1.9) menopoza yönelik düzensiz ve kısa süreli ilaç kullanmıştı. Günlük ortalama süt tüketimi 0.7 bardak (125-150 ml/gün) idi. Sadece %5.6'sı ek kalsiyum preparatı kullanmıştı; %9.3'ünde daha önce kalça, vertebra veya distal radius kırığı öyküsü vardı. Hipertansiyon (%50) ve diyabet (%29) en yaygın görülen sistemik hastalıklardı. Hiçbir hastada daha önce kemik yoğunluğu ölçümü yapılmamıştı.

Çıkarımlar: Anket sonucunda hastalarımızdaki osteoporoz risk faktörlerinin sıklığı göze çarparken osteoporoz tanı veya tedavisine yönelik girişim az bulundu. Bu hasta grubuna koruyucu hekimlik çalışmalarının yeterince ulaşamadığı görüldü.

Anahtar sözcükler: Yaşlılık; egzersiz; kadın; kalça kırığı/cerrahi; osteoporoz, menopoz sonrası/etyoloji; anket; risk faktörü.

Objectives: Management of hip fractures in elderly women should not be confined to surgical treatment and rehabilitation, but also encompass interventions and measures to protect them from hip fractures. We administered a questionnaire to female patients with hip fractures to determine their social profiles and risk factors.

Methods: A total of 107 female patients (mean age 74 years; range 63 to 100 years) who experienced hip fractures after the age of 60 years were administered a questionnaire to determine their physical and social characteristics, medical conditions , and nutritional status. In addition, the types of fractures and the Singh index were determined on hip radiographs. Femoral neck (n=51, 47.7%) and intertrochanteric (n=56, 52.3%) fractures were classified according to the Garden and modified Evans classifications, respectively.

Results: The mean body mass index was 23 kg/m^2. The Singh index was grade 3 in 70.1%, grade 2 in 26.2%, grade 4 in 2.8%, and grade 1 in 0.9%. Forty-four patients (41.1%) were illeterate, and 31 patients (29%) were only literate or could finish primary school. A history of smoking was found in 29.9% for a mean duration of 30.7 years. The majority of patients (67.3%) had limited activity and 63.6% had no outdoor work at all. None of them had a regular sport activity. Only two patients (1.9%) received inadequate and short-term postmenopausal therapy. The mean daily milk consumption was less than a glass (125-150 ml). Calcium supplements were used in only 5.6%. A history of previous fractures (hip, vertebra, distal radius) was detected in 9.3%. The most common coexistent diseases were hypertension (50%) and diabetes (29%). None of the patients had bone mineral density measurements.

Conclusion: Our study showed that, despite the high incidence of risk factors for osteoporosis, few patients received medical care for the diagnosis and treatment of osteoporosis, and that preventive health care measures were not as available as it should have been for this patient group.

Key words: Aged; exercise; female; hip fractures/surgery; osteoporosis, postmenopausal/etiology; questionnaires; risk factors.

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Received: 10.04.2004 **Accepted:** 02.06.2005

Hip fractures are one of the major health problems at present, with a higher incidence rate in women than men, which also increases by age in women. The gender difference is mainly determined by osteoporosis following menopause. Systemic conditions increasing by age are accompanied by some other problems in patients with hip fracture. It may take some time to present to a hospital following the occurrence of fracture for patients with a restricted range of motion due to arthrosis, cerebrovascular event and similar conditions. It presents a multidisciplinary challenge to stabilize such patients and get ready for interventions. The objective is to ambulate the patient as soon as possible. Immobilization will contribute to the present conditions. The mortality rate during the first year following the hip fracture has been reported to range between 20 to 25%.[1]

We have found out that female patients admitted to our clinic due to hip fracture have common in their social and cultural background, habits and diseases. The objective of the present study is to find out these common characteristics of such patients.

Patients and methods

A total of 107 out of 127 female patients (mean age 74 years; range 63 to 100 years) who experienced hip fractures (femoral neck and intertrochanteric fractures) after the age of 60 years and admitted to our service between June 2000 and 2002 were administered a questionnaire to determine their physical and social characteristics, medical conditions, and nutritional status. Three patients passed away before administrating the questionnaire; and 17 patients were excluded because their overall status was not good during the hospitalization or their responses were suspective or incomplete depending on their mental/emotional problems. Information from the questionnairre were classified; means were obtained; and type of fracture and the Singh index were determined. For femoral neck fractures, the Garden classification,[2] and for intertrochanteric fractures the Evans classification as modified by Jensen and Michaelsen[3] were used. The distribution of cases by these classifications is provided in Table 1.

The questions in the questionnaire were asked by the same physician. In case the patient couldn't remember well, information was obtained from his/her relatives depending upon the request by patient and the response was recorded after getting the patient's approval.

Results

The mean age was 74 years (range 63 to 100 years). The mean body mass index was 23 kg/m2 . The Singh index was Grade 3 in 70.1%, Grade 2 in 26.2%, Grade 4 in 2.8%, and Grade 1 in 0.9% of patients. No Grade 5 or 6 was found.

Fiftyone patients (47.7%) had femoral neck fractures, and 56 (52.3%) had intertrochanteric fractures. The mean age was 68 years (range 63 to 79 years) for patients with femoral neck fractures and 77.5 years (range 66 to 100 years) for patients with intertrochanteric fractures.

The results of the questionairre investigating the social profile of the elder women with hip fractures are summarized in Table 2. The concomitant sys-

Table 1. Classification and distribution of Collum femoris (n=51) and intertrochanteric (n=56) fractures

Collum femoris fractures	Garden classification	Number	Percent
Grade 1	Incomplete, impacted fractures with mild valgus malposition	3	5.9
Grade 2	Complete, but non-displaced fractures	7	13.7
Grade 3	Complete and varus malpositioned fractures	31	60.8
Grade 4	Completely displaced and no contact in fracture tips	10	19.6
Intertorachanteric fractures	Evans classification (as modified by Jensen-Michaelsen)		
Type 1A	Nondisplaced fractures with two fragments	8	14.3
Type 1B	Displaced fractures with two fragments	11	19.6
Type 2A	Fractures with three fragements involving trochanter major	4	7.1
Type 2B	Fractures with three fragements involving trochanter minor	16	28.6
Type 3	Fractures with four fragments involving both trochanters	17	30.4

Table 2. Summary and results of the questionairre for the social profile of the women with hip fractures, who are 60 years old and over at our clinic

		Number	Percent1.
1. Mobilization and activities	a. Bedridden/little or no active	4	3.7
	b. Active at home	72	67.3
	c. Randomly short distance walks	26	24.3
	d. Everyday outside short distance walks	5	4.7
	e. Regular walks for sportive purposes	–	
2. Regularly sportive (at least once a week)	a. Yes	–	
	b. No	107	100.0
3. Daily consumption of milk and/or yoghurt	0.33 cup/day yoghurt or 0.7 glass/day milk		
4. Mean age for menopause	46.3 years (range 40 to 55 years)		
5. Hormone replacement treatment	a. Received (irregular)	2	1.9
	b. Non-received	105	98.1
6. Patients taking medicines for osteoporosis	a. Calcium	6	5.6
	b. None	101	94.4
7. Lives with	a. Alone	11	10.3
	b. Husband	12	11.2
	c. Children and/or husband	81	75.7
	d. Others (e.g, caregiver)	3	2.8
8. Daily social activities	a. Has a job	–	
	b. Involved in charity works	–	
	c. Active in houseworks	1	0.9
	d. None	106	99.1
9. Previous job	a. Never worked	68	63.6
	b. Worker	17	15.9
	c. Officer	20	18.7
	d. Self employment	2	1.9
10. Working which requires carrying heavy things for a long period of time (incl.fieldwork)			
	a. Yes	33	30.8
	b. No	74	69.2
11. Number of children	a. One	5	4.7
	b. Two	16	15.0
	c. Three	17	15.9
	d. Four	41	38.3
	e. Five and over	28	26.2
12. Habits	Smoking: 32 (29.9%); mean 30.7 years		
	Alcohol: No regular consumer		
13. Use of cortizone and duration	6 patients (5.6%) mean 8.5 months		
14. Mean weight and height	59 kg (range 45 to 107 kg); 161 cm (range 152 to 171 cm)		
15. Any history of fracture	a. Vertebra (excl.depression, with little trauma)	3	2.8
	b. Distal radius	3	2.8
	c. Hip	4	3.7
	d. None		
16. Any history of fracture in the family (mother, father, sibling)	a. Vertebra (excl.depression, with little trauma)	1	0.9
	b. Distal radius	4	3.7
	c. Hip	5	4.7
	d. None	97	90.7
17. Body mass index	23 kg/m2 (range 18.5 to 25 kg m2) healthy		

* It is equivalent to a mean calcium intake of 125-150 mg/day

Table 3. Concomitant systemic conditions

	Number	Percent
Hypertension	54	50.5
Chronic obstructive pulmonary disease	13	12.2
Diabetics	31	29.0
Insulin users	9	29.0
Hyperlipidemia	6	5.6
Peptic ulcer/gastritis	27	25.2
Rheumatoid arthritis	3	2.8
Cardiac failure	19	17.8
Colitis	2	1.9
Coronary artery disease	17	15.9
Other	5	4.7

temic conditions are provided in Table 3.

Fortyfour patients (41.1%) were illiterate; 31 patients (29%) were only literate or graduate of primary school; 27 patients (25.2%) were graduate of secondary school, and three patients (2.8%) were graduate of high school; two patients (1.9%) had studied in the university.

Discussion

It has been reported that femoral neck fractures occur in women between a mean age of 72.6 and 79 years in developed countries.[2] However, in the present study femoral neck fractures were found at earlier ages (mean 68 years; range 63 to 79 years). Occurence of hip fracture in earlier ages can be explained by frequency of risk factors in this group. The sampling group in our study indicates that risk factors can not be prevented efficiently in our country.

The major factor increasing the risk for fractures in elderly women is osteoporosis. It is well understood that our patients lacked information on osteoporosis. Only two patients (1.9%) received inadequate and short-term postmenopausal treatment. The mean daily milk consumption was 0.7 glass (125-150 ml/day) in our patients; only 5.6% received additional calcium supplements. The daily milk consumption of our patients was much lesser than both overall consumption for Turkey (400 ml/day), and the western countries (800-930 ml/day).[4,5]

The body mass index was within the normal limits; although it was an indication of a balanced diet, it was not efficient to demonstrate the mineral deficiencies which may affect the bone development.

When it is taken into consideration that the patient group usually consists of çokcocuklu women (64% have 4 or more children), it is normal to expect deficiency of some minerals.

One of the risk factors for osteoporosis is smoking. The risk of fracture decreases 25% in women who quitted smoking prior to menopause.[6] The 29.9% of our patients reported that they smoked for a mean period of 30.7 years. Smoking increases fracture risk as well as increasing the morbidity during the surgery, playing a role in the etiology of other systemic conditions (Table 3).

The rate of patients with a previous fracture of hip, vertebra or distal radius was 9.3%; it was 9.4% in first-degree relatives. It was observed that the daily physical activities of patients were restricted. Performance of all metabolism, circulatory and respiratory systems is associated with the physical activity, not only the maintaintance of the bone structure.

Limited physical activity in women and men is directly associated with hip fractures. The ones with light or moderate physical activity are included in the risk group of hip fractures. Furthermore, it has been found out that the risk is higher in the ones with moderate physical activity;[7] because, in such cases both the risk for osteoporosis is high and the potential for fracture is higher as they are active. The 67.3% of the patients were active at home or in short distances. No patient was involved in regular sports. Majority of them (75.7%) were living with their children and/or their husband, and they were involved in housework together with other family members. The 63.6% of them didn't work. Only 30.9% worked in a job which helped to maintain/improve the body mass.

Of the concomitant conditions, hypertension and diabetics were higher (50% and 29% respectively) compared to the rates in the community. Type I diabetics is one of the causes of the secondary osteoporosis; use of insulin for a long period of time also results in osteoporosis in type 2 diabetics.[4] Nine of the diabetic patients (29.0%) were dependent on insulin.

Use of cortisone for a mean period of 8.5 months in 5.6% of patients was another factor which may have led to osteoporosis. No other conditions were found, potentially resulting in osteoporosis.

None of our patients had a bone density measurement before admission to our clinic; unaffected hips of the patients were evaluated by the Singh index. The fact that the index was grade 3 in 70% and grade 2 in 26% of patients is an indication of the lower bone mineral density. Very small number of patients with grade 1 suggests that the hip was fractured until it becomes more severe. The 70% of patients having hip fractures at grade 3 and sum of grade 1, 2 and 3 being 97.2% demonstrate that progression to grade 3 is a major factor increasing the risk for hip fracture.

There are many studies on the causes of mortality in patients with hip fractures. The studies have shown that advanced age, male gender, intertrochanteric location of fracture and limited motion before the fracture significantly increased the mortality.[8-10]

We continue to monitor our patients in order to evaluate the effect of our parameters on mortality.

Although the rate of illiteracy is around 20% in our country, it was 41.1% in our patient group. Our patients with a very low educational level, only 25.2% being a graduate of secondary schools do not reflect the overall figures of the country. However, it should be kept in mind that there is a group of people in our country, like our patients, who has no idea about the osteoporosis and associated risks for fractures. The present study showed the validity of known risk factors and their effects on the occurence of fractures. Focusing on the education of the society and preventive healthcare is very important in preventing the hip fractures

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