

A prospective study on osteoporotic fractures and falls in postmenopausal women

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Introduction

Fractures are the most important problem in osteoporosis. A lifetime risk of any fracture in 50-year-old woman is 39.7%. It is estimated that 1.5 mln of fractures occur during 1 year in USA, including: 700 000 spinal fractures, 300 000 proximal femur fractures, 250 000 distal radius fractures and 300 000 other fractures. A fracture is the result of force action overcoming mechanical strength of a bone. 90-100 % of non-spinal fractures and up to 50% of spinal fractures are caused by falls. The aim of this study is to evaluate frequency of fractures and their relation with susceptibility to falls in postmenopausal women.

Material

Amongst 76.000 patients of Krakow Medical Centre we selected 500 women aged 50 years and above who underwent at least 2 examinations in our centre within at least 1 year follow-up. This group of women visited our centre first time in 1995-2003, and later in 2004-2005. The age of examined patients ranged 50 to 80 yrs (average 65.8 yrs; SD=15.1). The follow-up period ranged 1 – 10.1 yrs (average 7.2 yrs; SD 4.91). Detailed interview according to prepared special questionnaire was collected in every case. The questionnaire covered data about falls and following fractures occurrence: spine, distal radius, other upper limb fractures, proximal femur, lower leg, ankle, foot and other lower limb fractures.

Data about falls was categorised as: “never”, “1-2 times a year”, “3 or more times a year”.

Bone mineral density measurements were performed in one or more regions: forearm (DTX200), spine or proximal femur (Lunar DPX IQ, Hologic Delphi W).

We calculated frequency of specific fractures which occurred in the first and the follow-up visit and we analyzed their relation to falls.

Results

Among all women seen at the first visit 195 (39.2%) reported fractures. There were total 268 different fractures, including distal radius 129 (25.9%), foot fractures 38 (7.6%), humerus fractures 23 (4.6%), spinal fractures 21 (4.2%), lower leg fractures 19 (3.8%), ankle fractures 12 (2.4%), clavicle fractures 4 (2.8%), ribs fractures 14 (0.8%) and proximal femur fractures 8 (1.6%).

At the follow-up visits after average 7.2 years there were 233 (46.9%) women who sustained any fracture. The total number of fractures increased to 404. Distribution of fractures in different localisations was: distal radius 165 (33.2%), foot fractures 58 (11.6%), humerus fractures 41 (8.2%), lower leg fractures 35 (7.0%), spinal fractures 30 (6.0%), ribs fractures 28 (5.63%), ankle fractures 23 (4.6%), clavicle fractures 8 (1.6%) and proximal femur fractures 16 (3.2%).

Data about falls was available in 432 women. Majority of them - 269 (62.3%) never fell down. Total 163 (37.7%) women experienced any fall within a year. Among these 1-2 falls were reported by 140 (32.4%) women, and 3 times and more falls were reported by 23 (5.3%) women.

In the group of women who fell 102 (63%) women sustained fractures, whilst in the group of non-fallers there were 121 (45%) women with fractures.

Frequency of fractures was significantly higher ($p=0.002$) in women who were prone to falls as compared to non-fallers. Falls were found to be the main factor increasing fracture risk.

Conclusions

39.2% of the investigated women reported fracture at the first time visit and 46,9% at the follow-up visit after 7.2 years of observation (increase 7.7%). 136 new fractures occurred in the follow-up time (increase 50.8%). Fractures were significantly more frequent in women prone to falls as compared to non-fallers (63% vs 45%, $p=0.002$). Falls were found to be the major risk factor of osteoporotic fractures.