

Would the first fragility fracture be the last one - a physiotherapeutic perspective

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Osteoporosis and fragility fractures are major world-wide public health problems [1]. Osteoporosis is defined as “a disease characterized by low bone mass and microarchitectural deterioration of bone tissue, leading to enhanced bone fragility and a consequent increase in fracture risk” [2]. Osteoporosis is known as the silent disease because there are no apparent early symptoms. For most people, the first indication that they have osteoporosis is a fracture or maybe severe back pain caused by a vertebral compression fracture [3]. An osteoporotic fracture is usually caused by a mild to moderate trauma such as a fall from standing height or less. However, osteoporotic vertebral compression fractures may also occur after lifting an object or bending forward [4]. The International Osteoporosis Foundation (IOF) believes that the prevention of a secondary fracture is the single most important thing that can be done to directly improve patient care and reduce increasing fracture related healthcare costs worldwide. IOF's Capture the Fracture® (<http://capturethefracture.org/>) is a global campaign to facilitate the implementation of coordinated, multi-disciplinary models of care for secondary fracture prevention. Fracture Liaison Services (FLS) are these coordinator-based secondary fracture prevention services implemented by health care systems for the treatment of osteoporotic patients [5].

The 10-year fracture probability of a hip or a major osteoporotic fracture in persons aged 40-90 years may be calculated by the FRAX® tool (<https://www.shef.ac.uk/FRAX/>), which integrates the weight of patient-derived clinical risk factors, with or without the inclusion of femoral neck bone mineral density (BMD). The introduction of FRAX® into physiotherapist practice is a rather new activity that should be highlighted. A prior clinical low-energy vertebral fracture or a hip fracture is an especially strong risk factor for achieving another osteoporotic fracture. Women with preexisting vertebral fractures have approximately four times greater risk of subsequent vertebral fractures than those without prior fractures and the risk increases with the number of prior vertebral fractures [3]. However, fracture probability may be underestimated as the FRAX questionnaire asks for any fracture in adult life and does not consider multiple fractures. Other fracture risk factors such as physical inactivity, propensity to fall and height loss since young adulthood (severe height loss may indicate vertebral fractures) are not either included in the FRAX algorithm model and thus should be asked for by the physiotherapist [6]. A fall is defined by the Prevention of Falls Network Europe (ProFaNE) as an unexpected event in which a person comes to rest on the ground, floor, or lower level. A person should be asked, “In the past month, have you had any fall including a slip or trip in which you lost your balance and landed on the floor or ground or lower level?” [7]. Balance performance, in

specific the ability to stand on one leg with the eyes open, is age-related and deteriorates after the age of 60 years [8]. Elderly women who did not manage to stand 10 seconds on one leg with the eyes open had an almost three-fold higher age-adjusted risk of hip fracture compared to those who managed this [9]. Women with osteoporosis often have weak back extensor muscles and also increased thoracic kyphosis that may influence balance performance [10]. The presence of osteoporotic vertebral fracture usually means worse health-related quality of life and pain [11,12].

Supervised individually tailored multicomponent exercise training program with progressive resistance training for all major muscle groups at least two times per week combined with 15-20 min daily balance exercises should be included in training programs for people with osteoporosis or osteoporotic fractures to prevent future falls and fractures [13,14]. Advice on fall prevention measures should also be communicated by the physiotherapist [15].

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