Epidemiology of Osteoporotic Fractures

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Osteoporosis is being increasingly recognized as a common condition associated with significant morbidity and mortality. Men are less likely than women to be diagnosed with osteoporosis or to receive adequate therapy. In women over 50, the lifetime risk of a hip fracture is 12.1%[1]. Approximately 23.5% of women with a hip fracture and 15.7% of women with an incident vertebral fracture die within five years following the fracture[2]. Mortality rates are higher in men at approximately 40% following a hip fracture in comparison to women.

The incidence of fracture is bimodal. There is a peak in the adolescent years with boys having more fractures then girls. These fractures usually occur in the long bones and are associated with trauma. There is a second peak in older adults occurring in the 55 to 80 year age group. In this population women have more fractures than men and these fractures are low trauma fractures. When all fractures are considered, the incidence in women climbs steeply and the rates of fracture are twice as high in women than in men.

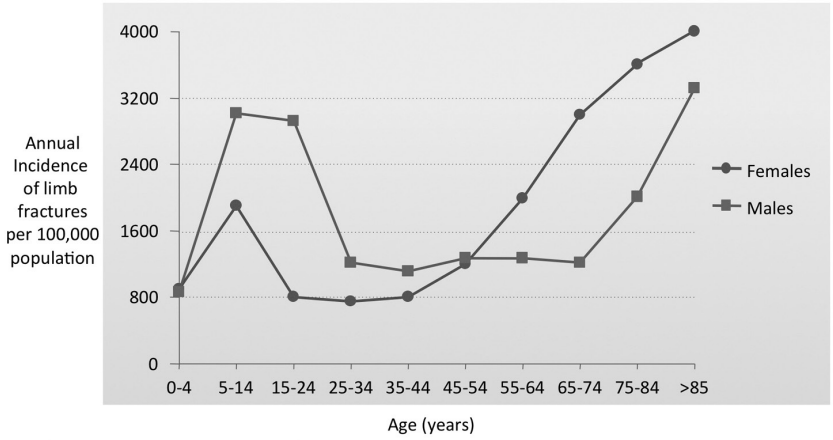
Prior fractures increase future fracture risk

	Relative Risk of Future Fractures		
Prior Fracture	**Wrist**	**Vertebra**	**Hip**
Wrist	3.3	1.7	1.9
Vertebra	1.4	4.4	2.5
Hip	–	2.5	2.3

Klotzbuecher CM et al. J Bone Miner Res. 2000;15:721.

Hip fracture
The incidence of hip fracture increases exponentially with age[4]. After the age of 50 women have twice as many hip fractures as men. The majority of the hip fractures occur after a fall from standing height and 90% occur in people over the age of 50[5]. Hip fractures appear to be associated with a sideways fall rather than a forward fall[6]. The incidence of hip fracture varies significantly from country to country. Sweden has the highest rate of hip fracture globally followed by the USA and Canada. China, Korea, and Chile have one of the lowest rates of hip fracture globally. There are a number of factors which impact fracture risk and include genetic as well as environmental factors.

Bimodal peak in limb fractures:



Garraway WN et al. Mayo Clin Proc 1979; 54:701-707

Vertebral fracture
The European Vertebral Osteoporosis Study (EVOS) demonstrated that the prevalence of vertebral fracture was similar in men and women between the ages of 50 and 79 at 12.2% for men and 12.0% for women[7]. It is most probable that the higher than expected incidence of vertebral fracture in men is in association with trauma. Vertebral fractures in elderly women usually occur with normal daily activities such as lifting, pushing or pulling. They can also occur with simple falls. Approximately, 2/3 of vertebral fractures are silent and are identified on plain films with only 1/3 of vertebral fractures actually coming to medical attention.

Vertebral fractures both clinical and morphometric are powerful predictors of future fracture risk and are associated with increased morbidity and mortality[11].

Most of the vertebral fractures occur below T6 as noted in the Rotterdam Study[8]. Not all vertebral fractures are due to osteoporosis and a bone scan or an MRI should be completed if there is concern of a pathologic fracture. The presence of a low trauma vertebral fracture, whether it is clinical or simply

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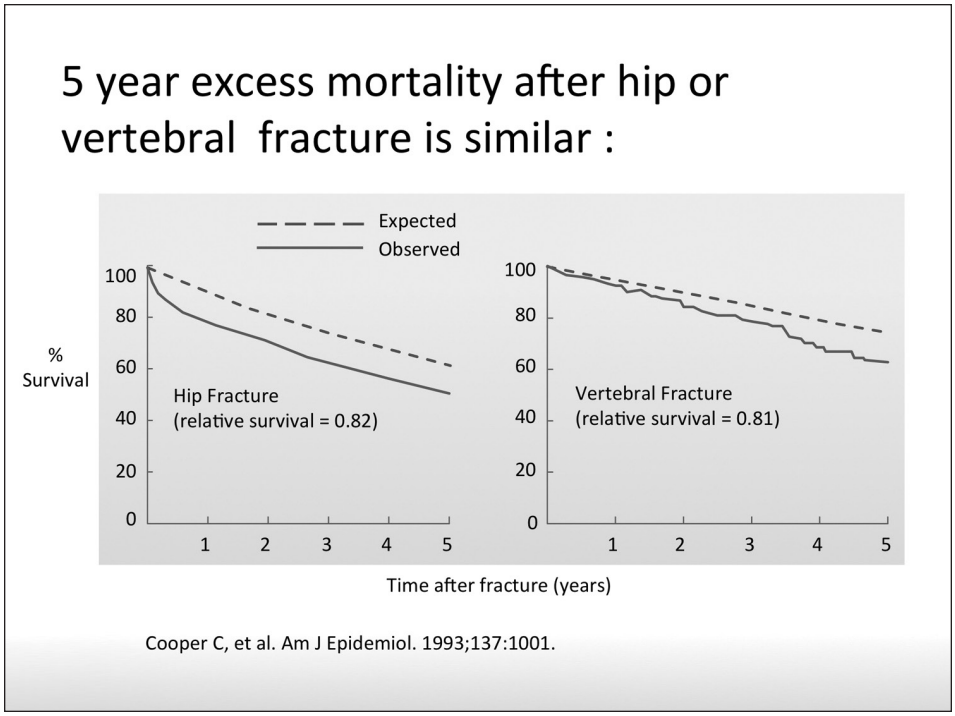
morphometric, is an indication for pharmacologic intervention. Vertebral fractures are a strong marker of fragility. The presence of a vertebral fracture is associated with a greatly increased risk of future fracture, particularly in the spine and also at other skeletal sites. The higher the number and grade of prevalent vertebral fracture, the greater the risk of future fracture[9].

Forearm fractures

The incidence of forearm fractures increases between the ages of 45 and 60 in women, although the risk above age 60 remains stable. A women's lifetime risk of a wrist fracture at the age of 50 is 16.6% and it decreases to 10.4% at 70 years. In men, the incidence of a forearm fracture does not rise with age, and the lifetime risk of fracture is 2.9% at the age of 50 and 1.4% at the age of 70[10].



In summary, osteoporosis is a common condition associated with significant morbidity and mortality. It is essential to identify the presence of osteoporosis following a fragility fracture. Intervention can significantly reduce the risk of further vertebral, non-vertebral, and hip fractures.

Unfortunately, today, the majority of patients who have had a fragility fracture are not treated for their underlying osteoporosis. In 2008 the Recognizing Osteoporosis and its Consequences in Quebec (ROCQ) study showed that only 15% of women receive drug therapy eight months after a fragility fracture[12].

At our hospital we have a Geriatric Hip Fracture Program. All patients who have been admitted to the hospital with a hip fracture are seen by Geriatric Medicine and the underlying osteoporosis is evaluated and therapy is implemented prior to discharge from the hospital. We have implemented a nurse in the Fracture Clinic with funding from the Ontario Osteoporosis Strategy and Osteoporosis Canada. This nurse identifies individuals who have had a fragility fracture and ensures that appropriate investigation and implementation of appropriate pharmacologic therapy takes place.

By focusing on identification of skeletal fragility and treating the underlying osteoporosis, we will be able to make a significant impact and reduce the risk of further fractures.

We all need to support Osteoporosis Canada's goal of making the first fracture the last fracture[13].

References

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