Risk factors for second hip fractures

Evaluation of: Mitani S, Shimizu M, Abo M, Hagino H, Kurozawa Y: Risk factors for second hip fractures among elderly patients. *J. Orthop. Sci.* 15, 192–197 (2010). Hip fractures are frequent and have severe consequences, such as pain and reduced function level, but also an increased risk of death. These factors also have a significant economic impact on the society. Once a hip fracture has occurred, the risk of a second hip fracture is high, with the same devastating consequences. It is thus important to know the risk factors in order to target prevention. A Japanese study has shown that respiratory disease and dementia are both risk factors for a second hip fracture. Preventive measures could include drugs against osteoporosis and hip protectors.

KEYWORDS: bisphosphonate ■ dementia ■ hip fracture ■ hip protector ■ osteoporosis ■ respiratory disease ■ second hip fracture

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Summary of methods & results

In a group of 384 men and women over the age of 50 years, with an incident hip fracture, Mitani *et al.* studied risk factors for sustaining a second hip fracture [1]. The group had a mean age of 83.1 ± 9.0 years (range: 51–102 years) and the incident hip fractures took place between 2001 and 2007. Mitani *et al.* followed their cohort for 3 ± 1.4 years and observed 49 second hip fractures. They confirmed prior findings that most second hip fractures took place early after the first hip fracture, with 86% of second hip fractures taking place within 3 years following the first hip fracture, and most taking place within the first 1.5 years.

Due to the low number of patients and the fact that gender was a weak risk factor, they could not confirm gender as a significant risk factor. They identified respiratory disease and dementia as significant risk factors for a second hip fracture. In particular, respiratory disease was associated with a high risk of second hip fractures (relative risk [RR]: 4.41; 2.33–8.34), while the RR for a second hip fracture associated with dementia was somewhat lower (RR: 1.87; 95% confidence interval [CI]: 1.02–3.41). Neurological disease, diabetes, hypertension, cardiac disease, osteoporosis and bone and joint problems were not significantly associated with the risk of second hip fractures. Furthermore, no difference in body mass index was present.

Discussion

Hip fractures are very frequent events [2], with very severe consequences primarily related to mortality, which is significantly increased compared with the general population [3]. Other consequences are a loss of function, with many patients being admitted to nursing homes following a fracture [4]. The economic consequences are also severe in most societies [5]. In general, patients with a prior fracture are at an increased risk of suffering new fractures [6], and this holds especially true for hip fractures [7]. There is a significantly increased risk of new hip fractures within the first year following the incident hip fracture [7]. The mortality following a hip fracture is particularly related to the trauma from the hip fracture [7]. In order to be able to prevent new hip fractures, knowledge of risk factors is essential so that prevention may be targeted at those who are at the highest risk.

Prior studies have suggested age as a strong risk factor for a second hip fracture [7]. Gender is also a risk factor, with women suffering more fractures than men, although gender is a weak risk factor (RR: 1.36; 95% CI: 1.32–1.40 for women suffering a second hip fracture compared with men). Also, a diagnosis of alcoholism is a risk factor for suffering a second hip fracture [7].

It is surprising that osteoporosis was not a risk factor for a second hip fracture. It is not clear how osteoporosis was defined, but if many patients had not received a bone scan, osteoporosis may have gone unnoticed. On the other hand, most hip fractures are related to osteoporosis [8], and it may be difficult to identify osteoporosis as an independent risk factor in a group who is already osteoporotic.

Dementia is most likely related to the risk of second hip fractures through the risk of falls associated with cognitive impairment.

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However, decreased vitamin D levels from insufficient intake or sunlight exposure may also play a role [9]. Preventive measures may include supplements with calcium and vitamin D [10], antiresorptive [11] or even anabolic drugs [12] against osteoporosis and hip protectors to prevent the consequences of falls [13]. In the use of calcium and vitamin D, is should be observed that a significant effect has been shown only for combinations of calcium and vitamin D [10], and the effect is only evident with the use of more than 1200 mg of calcium and 800 IU (20 µg) of vitamin D per day [10]. Dementia is in most cases a nonmodifiable risk factor; it cannot be cured and the cause thus removed. Only by preventing fractures through the prevention of falls, strengthening of the skeleton and prevention of the consequences of a fall can fractures be prevented.

For respiratory disease, many risk factors play a role. Patients with respiratory disease are often underweight, have a low food intake and are thus deficient in calcium and vitamin D. They are often also immobilized from lack of breath contributing to disuse osteoporosis [14]. The accumulation of carbon dioxide from reduced pulmonary function may contribute to loss of calcium from the skeleton [15]. Most inhaled drugs for lung disease are not associated with any risk of fractures [14]. The major risk factor for fractures in patients with lung diseases is the use of corticosteroids [16], especially as prolonged use of oral corticosteroids [16]. Even doses as low as 2.5 mg per day may be associated with an increased risk of fractures [17].

Thus, prevention may be aimed at several factors, primarily reducing the exposure to oral corticosteroids (e.g., by replacing these with inhaled corticosteroids) [16]. As mentioned previously, the use of drugs against osteoporosis is also important.

The main findings of the study by Mitani *et al.* are thus the identification of dementia and respiratory diseases as significant risk factors for new hip fractures, as well as the confirmation of the high risk of second hip fractures early after the first. Prevention must therefore be started early after a hip fracture. Recent studies have pointed at intravenous zoledronate as perhaps being a good treatment, which not only prevents new fractures [18], but perhaps also reduces the risk of death [19].

Future perspective

More research is needed regarding risk factors for a second hip fracture in order to better direct prevention. Not only nonmodifiable risk factors, but also potentially modifiable risk factors should be targeted. Effective prevention against future hip fractures should be administered to patients with a hip fracture because they are at a high risk of future hip fractures.

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Executive summary

- The risk of second hip fracture is high among patients who have already suffered a hip fracture.
- Respiratory disease and dementia seem to be risk factors for future hip fractures.
- Special focus is needed in patients with these conditions to prevent future hip fractures.
- It is important to start prevention against future hip fractures among patients who have suffered a hip fracture. Drugs against osteoporosis give protection against other types of fractures.

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