

## Improving the treatment of major osteoporotic fractures

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Mortality is high after hip or vertebral fracture.<sup>1</sup> The cohort study by Ioannidis and colleagues,<sup>1</sup> which involved a large population of unselected Canadian patients, adds valuable information about the prognosis after hip and vertebral fracture. Unfortunately, the news is gloomy. The results tell us that a patient who has a hip fracture has a 1-in-4 chance of dying in the 12 months after the fracture. These patients have about a 3-fold increased risk of death compared with people who have not had a fracture.

People who fall and have a fracture are more likely than people who do not fracture to be unhealthy. In this study, even after adjustment for factors such as comorbid conditions, medications, health-related habits and quality of life, the relation between incident fractures and mortality remained. This suggests that fractures cause excess mortality and that preventing fractures may prevent deaths. What, then, can be done to improve these patients' chances of survival?

One solution is to prevent further fractures. Best practice guidelines include the use of oral bisphosphonates, calcium and vitamin D, and strategies to prevent falls, such as balance and strength training. The annual use of intravenous zoledronate reduced mortality in older adults who had already had a hip fracture.<sup>2</sup> In a randomized controlled trial, the use of zoledronate decreased mortality by 28% (hazard ratio 0.72, 95% confidence interval 0.56–0.93,  $p = 0.01$ ). The underlying mechanism of this effect is unclear because the number of hip fractures was not significantly reduced.

Preventing falls is probably an effective way to prevent fractures.<sup>3</sup> To date, there have been no large randomized controlled trials of strategies to prevent falls including only patients who have had a previous hip fracture. Nevertheless, there is compelling evidence from a Cochrane review that falls can be prevented in frail elderly people by about 30%, particularly in those aged 80 or more years.<sup>4</sup> This is likely also true for those who have fallen already.

Although the results have been somewhat mixed, hip fractures have been reduced in extended care settings by the use of hip protectors that have been tested biomechanically and shown to achieve adequate force attenuation.<sup>5</sup> This is relevant for many patients after hip fracture.

Integrating these best practice guidelines into practice can be challenging, but there is evidence for the use of a fracture liaison service<sup>6</sup> to routinely identify patients who have experienced a fracture. A fracture liaison service consists of a nurse who identifies seniors who have fall-related fractures. These patients can be assessed and given treatment or referred back

### Key points

- Hip fracture and clinical vertebral fracture are not treated as seriously as the results of the study by Ioannidis and colleagues suggest they should be.
- Improvements in management should include fracture liaison services, attention to delivering fall-prevention services and consideration of bisphosphonate therapy.
- Whether there are sex differences in outcome after these fractures remains unclear because the present study was not powered to address this issue.

to their family physician for investigation and treatment. This model has improved the management of osteoporosis after fracture in the United Kingdom and Canada.<sup>6</sup> However, the interventions did not always include fall prevention nor were the studies large enough to be able to report the effect on other outcomes, such as subsequent injury rates or mortality.

In the study by Ioannidis and colleagues,<sup>1</sup> rib and wrist fractures did not appear to contribute to mortality, despite increased mortality after hip and vertebral fractures. This study extends the somewhat mixed findings from previous studies involving vertebral fractures because the study cohort was representative of the general population and the participants were not selected because of high risk of osteoporosis. The findings of excess mortality refer to clinical (i.e., symptomatic) fractures and not to asymptomatic vertebral fractures detected by imaging alone. The clinical challenge remains in consistently identifying vertebral fractures and directing patients to appropriate care. Patients often report "back pain," which may not be investigated further because of the assumption that the symptoms are self-limiting and are because of osteoarthritis or a disc-related injury.

The differences in mortality between men and women that have been previously observed were not found in the study by Ioannidis and colleagues. However, the authors noted that their study was underpowered to detect this difference. Previous investigations noted that, compared with older women, older men had twice the risk of dying after hip<sup>7</sup> or vertebral fracture.<sup>8</sup> Compared with women, men who sustain a first hip fracture tend to be younger and have more chronic diseases at

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the time of their fracture. Fractures may be markers for underlying frailty and account for the almost doubling of risk for mortality among men after a hip fracture compared with women in other studies.<sup>7,8</sup> Another potential explanation for the increased risk could be the low rate of investigation for bone disease in men after fracture.<sup>9</sup>

Cognitive impairment and dementia are major risk factors for fall-related fractures. Patients with these conditions are generally under-represented in cohort studies because of the challenge of recruiting them. If that was the case in this Canadian cohort (and it most likely was), the mortality data may contain “healthy volunteer bias” and the population mortality rates may be even higher than reported by Ioannidis and colleagues. Along these lines, the average age of patients with a hip fracture in this study was 71, while the average age of Canadians with hip fracture is a decade later. We question whether a registry of hip fractures in Canada might find annual mortality rates that are even higher than those reported here.

Despite the clearly catastrophic nature of osteoporotic hip and vertebral fractures, patients often do not receive optimal care. In a small randomized controlled trial to improve community-based care after hip fracture,<sup>10</sup> we noted that less than one-third of patients in the control group received care (bone mineral density assessment, bisphosphonates, vitamin D, calcium or exercise prescription) despite being admitted to a major tertiary facility and having follow-up by a family physician. What systems, resources and strategy are being devoted to a condition that kills at least one-quarter of its victims within 12 months? There is room for improvement.

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