Osteoporosis in patients with inflammatory bowel disease

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Increased incidence of "fragility" fractures in patients with inflammatory bowel disease

Bernstein CN, Blanchard JF, Leslie W, *et al.* The incidence of fracture among patients with inflammatory bowel disease—a population-based cohort study. *Ann Intern Med* 2000;**133**:795–9.

Background: The clinical significance of the high prevalence of osteopenia in inflammatory bowel disease is unclear.
Objective: To determine whether subjects with inflammatory bowel disease have an increased incidence of hip, spine, wrist/forearm, or rib fractures.
Design: Population based matched cohort study.
Setting: Manitoba, Canada.
Patients: Patients with inflammatory bowel disease in the University of Manitoba inflammatory bowel disease (IBD) database (n=6027) were matched with 10 randomly selected subjects in the general population (1.14 million) without IBD by year, age, sex, and postal area of residence.
Measurements: The incidence of hospitalisation for hip fracture was determined on the basis of hospital discharge records. Outpatient medical billing records and hospital discharge records were used to calculate the incidence of spine, rib, and forearm fractures. Rates were calculated on the basis of person years of follow up for 1984 to 1997.
Results: Patients with IBD had a significantly increased incidence of fractures at the spine (incidence rate ratio (IRR) 1.74 (95% confidence interval (CI) 1.34–2.24); p<0.001), hip (IRR 1.59 (95% CI 1.27–2.00); p<0.001), wrist/forearm (IRR 1.33 (95% CI 1.11–1.58); p=0.001), and rib (IRR 1.25 (95% CI 1.02–1.52); p=0.03), and of any of these fractures (IRR 1.41 (95% CI 1.27–1.56); p<0.001). Patients with ulcerative colitis had similar fracture rates to those with Crohn's disease.
Conclusion: The incidence of these fractures among those with IBD was 40% greater than that in the general population.

There is consistent evidence that patients with inflammatory bowel disease (IBD) have an increased risk of osteoporosis, defined by reduced bone mineral density (BMD).[1] The important clinical end point of osteoporosis however, is fractures; these are associated with significant morbidity and mortality and healthcare costs. The retrospective cohort study of Bernstein *et al* shows a 40% increase in the risk of fracture among patients with IBD compared with age and sex matched controls.[2] The increased risk was similar in patients with Crohn's disease (CD) and ulcerative colitis (UC). These results differ from a large Danish case control study which reported a 2.5-fold increase in the risk of fracture among women with CD but failed to demonstrate a statistically significant increased risk among men with CD or patients with UC.[3] The literature on BMD in IBD is also discordant when comparing the risk of osteoporosis in patients with CD with those with UC.[1] Further large studies of fracture in these disorders are required to quantify the risk in CD and UC.

The reduction in BMD in patients with IBD is multifactorial; risk factors include the use of oral corticosteroids, vitamin D deficiency, malabsorption, malnutrition, hypogonadism, and systemic inflammation. The use of oral corticosteroids increases the risk of fracture at most sites across a range of diseases.[4] In IBD, continuous, but not intermittent, use is associated with a significant reduction in BMD.[5]

Prevention and treatment of osteoporosis should include lifestyle interventions: encouraging regular weight bearing exercise, moderation of alcohol intake, cessation of smoking, and maintaining good dietary calcium and calorie intake. Optimisation of disease control is also important to reduce the systemic inflammatory load and cachexia. It is important to check vitamin D status as patients with IBD are often vitamin D deficient and supplementation has been shown to reduce bone loss.[6] Hormone replacement therapy in postmenopausal women with IBD reduces bone loss[7] but any benefit from testosterone replacement in men is currently unproved. In a 12 month randomised controlled trial, alendronate, a potent bisphosphonate, increased BMD by 3.3–4.6% and was well tolerated in patients with CD and low BMD.[8]

All patients with IBD should be counselled on lifestyle measures to prevent bone loss and consequent fractures but how should we identify patients who require more effective but expensive treatments such as the bisphosphonates? BMD, measured by axial bone densitometry, is the strongest determinant of future fracture, with a similar predictive capacity as that of blood pressure for stroke. Each standard deviation reduction in BMD is associated with an approximate doubling of fracture risk.[9] BMD however should not be used as the sole diagnostic criterion but rather in conjunction with other major risk factors such as continuous corticosteroid use or previous fragility fracture, both of which independently double the risk of fracture. It is also essential to consider the absolute risk of fracture in a given patient. In patients with IBD aged less than 40 years, the annual risk of sustaining a hip fracture is 0.004%.[2] At this low incidence it seems appropriate to only prescribe bisphosphonates if the patient has multiple risk factors or very low BMD. Patients with few risk factors should have lifestyle measures, optimal control of their IBD, and should be monitored. By the time patients are aged over 60 years, the annual risk of hip fracture rises to 1.3%[2] and the presence of one or more risk factors justify consideration of pharmacological treatments such as the bisphosphonates.

Physicians managing IBD need to be vigilant in identifying and correcting risk factors for osteoporosis but should perform a careful risk assessment, including consideration of age, BMD, fracture history, and corticosteroid use, before commencing potent agents such as bisphosphonates.

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Conflict of interest: Drs Arden and Cooper have

lectured on behalf of Proctor and Gamble, Merck Sharpe and Dohme, Shire Pharmaceuticals, and Lilley and Company.

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