



## BONE LOSS IN IBD

As many as 30% to 60% of people with Crohn's disease or ulcerative colitis have lower-than-average bone density. In some individuals, it takes the form of *osteoporosis* (a condition that literally means "porous bones"). In others, the bone abnormality is *osteopenia* (low bone density) or *osteomalacia* (softening of the bones). These conditions occur more frequently in people with Crohn's disease than in those with ulcerative colitis. They also are more common in women than in men. Low bone density can affect IBD patients at any age. In fact, many individuals with Crohn's have osteoporosis at just the age when they should be at peak bone strength—age 20 for women and age 30 for men.

### WHAT IS BONE DENSITY?

Although bone seems as hard as a rock, it's actually living tissue. Throughout your life, old bone is removed and new bone is added. These two processes—bone resorption and bone formation—are twin components of the body's continuous bone turnover known as *bone remodeling*. If bone resorption and formation occurred at exactly the same pace, bone mass would remain the same. But that isn't the case. After age 35 or so, bone resorption outpaces formation and bone density begins to decline. Some loss of bone density is normal. Only when the process accelerates does osteoporosis become a threat.

### SYMPTOMS

Although people with osteoporosis may notice some back pain or change in posture, this disorder generally produces no symptoms until the bone becomes so weakened that it breaks. Bone fractures due to osteoporosis most often occur in the spine and hips. This is why screening tests for bone loss (bone density testing) and preventive measures to halt bone loss are so important.

### CAUSES OF BONE LOSS IN IBD

Experts point to several suspected causes for bone loss in IBD, including the following:

#### *Corticosteroid therapy*

These powerful anti-inflammatory medications can produce serious side effects, and bone loss is one of them. It is believed that 30% to 50% of people who take corticosteroids on a long-term basis develop osteoporosis, and the effects are cumulative—with the impact on bone health depending largely on the dose and length of time that a person is on these medications. Corticosteroids impair the formation of new bone by:

- Decreasing the amount of calcium (an essential bone-building mineral) absorbed by the intestines from food
- Increasing the excretion of calcium in the urine
- Stimulating the production of cells that break down bone
- Decreasing the number of bone-forming cells
- Reducing the production of the hormone estrogen, which contributes to strong bones

#### *Inflammation in active disease*

People with IBD have elevated concentrations of specialized proteins, called cytokines, which increase the body's inflammatory response. These chemicals may disrupt normal bone metabolism—the pace at which old bone is removed and new bone is formed. It also appears that individuals with more active forms of Crohn's may be at increased risk of developing osteoporosis because their cytokine activity is greater. The cytokine connection also might explain why people with ulcerative colitis suffer less bone loss than those with Crohn's disease. Although the two diseases have many similarities, they differ when it comes to cytokine balance. Even people who have had ulcerative colitis for years may still enjoy good bone health. Those who do show evidence of bone loss tend to be individuals who have used corticosteroids for some time.



## **VITAMIN D DEFICIENCY**

Vitamin D is necessary for the absorption of calcium. Together, these two are critical for building healthy bone. Because this vitamin is absorbed in the small intestine, people with Crohn's disease— particularly those who have undergone small bowel resection or who have extensive small bowel involvement—are at increased risk for vitamin D deficiency. This, in turn, may result in bone loss due both to reduced calcium absorption and to poor bone mineralization. That is why people who have undergone surgery to remove much of their small bowel are at increased risk of developing osteoporosis. The remaining intestine may not be adequate to absorb necessary quantities of calcium and vitamin D. Another factor that can deprive the body of vitamin D is inadequate sun exposure, as sunlight works to synthesize vitamin D in the skin.

## **GENERAL RISK FACTORS**

According to experts, increasing age, female gender, and low body mass index (BMI) put people with IBD at greater risk for bone loss than any of the other causes described above. That means that older, female Crohn's patients who are of slight build are at greater risk for bone-thinning conditions than younger and heavier patients. Smoking and alcohol consumption increase that risk.

## **DIAGNOSIS**

Diagnosis of bone loss is generally made with a special X-ray technology called dual-energy X-ray absorptiometry (DEXA). Results of the test—which measures bone mineral density in the spine, hip, and other bones—indicate the risk of suffering a bone fracture. In the general population, a diagnosis of osteopenia (weak bones) doubles the risk of fracture; osteoporosis increases the risk by four or five times. But here is an interesting recent finding: Although people with IBD have above-average rates of osteoporosis and osteopenia, their actual fracture rates are comparatively low.

## **PREVENTION OF BONE LOSS**

Preventive measures include reducing the controllable risk factors that contribute to bone loss:

- Reduce steroid use (under your doctor's supervision)
- Use steroid-sparing drugs such as azathioprine, 6-MP, methotrexate, infliximab, or budesonide—a systemic corticosteroid with fewer side effects than traditional steroids.
- Take medications to enhance bone health, which include the once-a-week bisphosphonate drugs risedronate (Actonel®) and alendronate (Fosamax®), the only drugs approved for steroid-induced osteoporosis. Bisphosphonates are most often prescribed for selected patients beginning treatment with prednisolone or its equivalent, as well as for menopausal women on steroids who have a bone mineral density (BMD) below normal.
- People with IBD also can take the following self-care steps to help prevent bone loss:
  - Restrict alcohol consumption
  - Stop smoking
  - Engage in regular physical activity
  - Eat a diet rich in calcium or take 1,500 mg of calcium daily
  - If you don't get enough natural exposure to sunlight, then dietary sources of vitamin D are essential. These include fortified milk, fish oils, and liver. Alternatively, take 400 units daily of supplemental vitamin D (contained in many multivitamins).

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