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# The Frequency of Osteoporosis Screening in Men with Inflammatory Bowel Disease

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## Introduction

Although it is recognized that osteoporosis and osteoporosis related fractures are more common in women, men are also at an increased risk. Osteoporosis continues to be underdiagnosed in men, and it remains untreated in the majority of men with fractures (1). One third of all hip fractures worldwide occur in men (2) and more men than women die in the year after a hip fracture (3). Risk factors associated with osteoporosis include corticosteroid use, excessive alcohol use, hypogonadism, vitamin D deficiency, smoking, prior history of fragility fracture, and family history of fractures (4,5). Given that many men with inflammatory bowel disease (IBD) are on chronic corticosteroids, have testosterone deficiency, and are at risk for vitamin D deficiency due to malabsorption and bowel resections, they are at a higher risk for osteoporosis (5).

The American College of Physicians (ACP) recently published guidelines for screening men for osteoporosis and recommend screening with dual-energy x-ray absorptiometry (DXA) scans in men older than 70 years, as well as in men younger than 70 years who have low body mass index, significant weight loss, physical inactivity, corticosteroid use, androgen deprivation therapy, or previous fragility fracture (6). The American College of Gastroenterology and the American Gastroenterological Association have both recommended that men with IBD and additional risk factors be screened for osteoporosis with DXA scans. They also recommend minimizing and discontinuing corticosteroids whenever possible and to start calcium and vitamin D supplementation early in the course of disease in order to prevent osteoporosis and osteopenia (5,7). Recent data suggests that patients with IBD often have suboptimal vitamin D levels and that lower vitamin D levels are correlated with lower baseline BMD in both males and females (8).

Given that men with IBD are at an equal risk for vitamin D deficiency as women with IBD (5), along with many men having increased risk factors due to corticosteroid use, testosterone deficiency, malabsorption, and potential substantial weight loss with exacerbations, screening for osteoporosis should be performed with both vitamin D levels and DXA scans. This study evaluates how frequently vitamin D levels and DXA scans are ordered in men with IBD by gastroenterologists in a university based gastroenterology clinic.

## Methods

The records of all patients with IBD who were seen in the gastroenterology outpatient clinic at a university medical center between January 2007 and June 2008 were reviewed retrospectively. Information was collected on corticosteroid use, vitamin D level screening, and bone mineral density testing. All lumbar spine and proximal femur bone mineral density in our population was measured using dual-energy x-ray absorptiometry (Hologic QDR-4500, Waltham, MA). Risk factors for osteoporosis including known fractures, smoking history, and prior intestinal resection were identified. The study was approved by our facility's institutional review board. A database was compiled, and statistical analysis was performed using chi-square tables with p values.

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| Total number of patients in cohort, n | 79 |
| Age, yr (Range) | 38.2 (20 to 72) |
| Crohn's disease, n | 39 |
| Ulcerative colitis, n | 40 |
| Duration of illness, yr (Range) | 12.5 (0 to 43) |
| BMI, kg/m$^2$ (Range) | 26.3 (18.1 to 40.7) |
| Current corticosteroid use, n (%) | 25 (31.6%) |
| Caucasian race, n (%) | 63 (79.7%) |
| African American race, n (%) | 13 (16.5%) |
| Not Caucasian or African American race, n (%) | 3 (3.8%) |
| Smoker, n (%) | 9 (11.4%) |
| Prior intestinal or colonic resection, n (%) | 17 (21.5%) |

Table 1 – Baseline characteristics of study population

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| 25OH-Vitamin D screening, n | 7 (8.8%) |
| 25OH-Vitamin D score, ng/mL (Range) | 19.8 (5 to 31) |
| Vitamin D deficiency (25OH-Vit D<20ng/mL), n | 3/7 (42.9%) |
| Testosterone screening, n | 4 (5.1%) |
| Total testosterone level, ng/dL (Range) | 294.3 (251 to 346) |
| DXA scan screening, n | 17 (21.5%) |
| Average age at screening, yr (Range) | 39.7 (20 to 65) |
| BMI, all DXA scan patients, kg/m$^2$ | 25.6 |
| DXA scan T-score, lumbar L1-L4 (Range) | -1.37 (-3.60 to 0.85) |
| DXA scan Z-score, lumbar L1-L4 (Range) | -1.20 (-3.10 to 0.85) |
| DXA scan T-score, total proximal femur (Range) | -1.30 (-2.60 to –0.09) |
| DXA scan Z-score, total proximal femur (Range) | -1.03 (-2.44 to 0.00) |
| DXA scan screening, on corticosteroids | 9/25 (36.0%) |
| DXA scan screening, not on corticosteroids | 8/54 (14.8%) |
| DXA scan screening, Crohn's disease | 7/39 (17.6%) |
| DXA scan screening, ulcerative colitis | 10/40 (25.0%) |

Table 2 – Vitamin D, DXA, and testosterone screening results

## Results

A total of 204 records were reviewed of patients with known Crohn's disease (CD) or ulcerative colitis (UC), of whom 79 were male. Of these, 39 (49.4%) had CD and 40 (50.6%) had UC. The average age of the male group was 38.2 years, with an average duration of illness of 12.5 years.

Seven patients had 25OH-vitamin D screening, with an average 25OH-vitamin D level of 19.8ng/mL. Three patients had vitamin D deficiency, defined as a 25OH-vitamin D level of <20ng/mL. Primary care physicians, gastroenterologists, rheumatologists, and endocrinologists ordered vitamin D levels. Four patients had testosterone testing as assessment for new osteoporosis diagnosis. All four patients had testosterone levels in the normal range.

17 patients had DXA scans, with an average lumbar T-score of–1.37 and an average total femur T-score of –1.30. More patients on corticosteroids had DXA scans (36.0%) versus patients not on corticosteroids (14.8%, p=0.04). Four of 17 patients (23.5%) had osteoporosis (T-score <–2.5 if age over 50 or Z-score <–2.0 if age under 50). Seven of 17 (41.2%) had osteopenia (T-score <–1.0). There were no significant differences in BMI between osteoporosis/osteopenia patients (BMI 25.8kg/m$^2$) and those with normal bone density (BMI 25.3kg/m$^2$). Patients that were diagnosed with osteoporosis were not significantly older than the average age of the cohort (41.0 yr versus 39.7 yr).

When the osteoporosis patients and osteopenia patients are combined, 11 of 17 (64.7%) of the patients that had DXA scanning had T-scores of <–1.0. All patients diagnosed with osteoporosis were started on calcium, vitamin D, bisphosphonate, and were referred to rheumatology for further osteoporosis follow up. There were four fractures documented within the cohort, two of which were considered fragility fractures (an L2 compression fracture in a 23 year old and an L4 compression fracture in a 48 year old).

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| Osteoporosis on DXA scan (T-score <-2.5 if age over 50 or Z-score <-2.0 if age under 50), n | 4/17 (23.5%) |
| Age at diagnosis of osteoporosis, yr (Range) | 41.0 (32 to 55) |
| Osteopenia on DXA scan (T-score <-1.0), n | 7/16 (41.2%) |
| Normal bone density on DXA scan, n | 6/16 (37.5%) |
| BMI of osteoporosis/osteopenia patients, kg/m$^2$ | 25.8 |
| BMI of normal bone density patients, kg/m$^2$ | 25.3 |
| Osteoporosis/osteopenia pts on corticosteroids, n | 6/11 (54.5%) |
| Osteoporosis/osteopenia pts not on corticosteroids, n | 5/11 (45.5%) |
| Normal bone density pts on corticosteroids, n | 3/6 (50.0%) |
| Normal bone density pts not on corticosteroids, n | 3/6 (50.0%) |
| Fractures documented in cohort, n | 4 (phalanx, metatarsal, L2, L4) |

Table 3 – Characteristics of osteoporosis and osteopenia patients in cohort

## Discussion

Hip fractures and compression fractures from osteoporosis carry significant morbidity and mortality (1,2,3). The ACP recommended in their guidelines for osteoporosis screening in men more research to determine effective prevention measures for osteoporosis (6). The data from our study, albeit using a cohort from a single gastroenterology practice, illustrates that a significant proportion of men with IBD will have low BMD, as 23.5% of patients that were screened with DXA scans had osteoporosis and 64.7% of patients had either osteoporosis or osteopenia. In addition, our study showed that a significant proportion of men with IBD will have low vitamin D levels.

IBD is a chronic illness with many potential risk factors for osteoporosis. Corticosteroid use, low body mass index, significant weight loss, testosterone deficiency, and vitamin D deficiency have all been associated with an increased risk of osteoporosis (4,5,6). Many patients are not aware of osteoporosis as a potential consequence of their illness. Therefore, it is important for all physicians who treat IBD patients to educate IBD patients about the risk of osteoporosis and make efforts early on to screen, prevent, and treat osteoporosis. By doing this, the risk of fragility fractures will be reduced as much as possible.

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