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Tesi di Dottorato

**ROLE OF VITAMIN D IN THE MODULATION OF CHRONIC BOWEL
INFLAMMATION AND IN THE GENESIS OF BONE MASS LOSS IN PATIENTS WITH
INFLAMMATORY BOWEL DISEASES.**

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ABSTRACT

Background: Inflammatory bowel disease (IBD) is a chronic immune-mediated inflammatory disorder of the gastrointestinal tract consisting two principal categories, ulcerative colitis (UC) and Crohn's disease (CD). Bone alterations in IBD population are frequently described and appear to have a multifactorial etiology: inflammation, changes in diet, malabsorption of calcium and vitamin D, decreases in physical exercise, and the use of osteotoxic medications. Bone alterations increased the risk of osteoporosis and fractures in IBD patients. Vitamin D is an immunoregulatory factor that seems to play a significant role in the pathogenesis of IBD by affecting both the gut microbiome and the inflammatory response.

Aim: This study aimed to evaluate the levels of the active form of vitamin D the 1,25(OH)₂VitD in IBD patients and the possible correlation with the risk of osteoporosis. Secondly, we aimed to study the bone status in patients affected by IBD using the peripheral Quantitative Computed Tomography (pQCT), a new tool for the assessment of Bone Mineral Density (BMD).

Methods: Patients with IBD (CD and UC) were consecutively enrolled from November to May. For each patient calcium, phosphate, creatinine, serum protein/albumin, 25(OH)VitD, 1,25(OH)₂VitD, and PTH levels were measured. C-reactive protein (CRP) and fecal calprotectin were used to assess the presence of inflammation. All patients underwent pQCT both at forearm and lower leg. Tibia and radius BMD, T and Z score were calculated.

Results: Forty-five IBD patients (25 CD and 20 UC) were enrolled. There were no statistically significant differences between the CD and UC patients in terms of age, gender and disease duration. There was a high prevalence (71%) of vitamin D insufficiency in IBD patients (76% CD and 65% UC patients). The prevalence of vitamin D insufficiency was significantly higher in patients with elevated fecal calprotectin (≥ 100 mg/kg) (83.3 vs 37.5%, $p=0.035$) but it was not significantly different in patients with elevated CRP (31.6 vs 20%, $p=0.5$). Mean BMD, T score and

Z score were significantly lower CD compared to UC patients ($p < 0.05$ in all cases). The prevalence of osteoporosis was higher in CD than UC patients, although the difference did not reach the statistical significance (44 vs 20%, $p = 0.09$). A significant inverse correlation was found between radius and tibia BMD values and disease duration ($r = -0.35$, $p = 0.05$ and $r = -0.33$, $p = 0.06$, respectively) and between radius and tibia BMD and treatment with biologics ($r = -0.45$, $p = 0.002$ and $r = -0.44$, $p = 0.003$, respectively). no correlations were found between PTH, 25(OH)VitD, and 1,25(OH)₂VitD levels and radius and tibia BMD values ($p > 0.05$).

Conclusions: Vitamin D insufficiency was highly prevalent in IBD population. Thus, it would be beneficial for all IBD patients, especially those with active bowel inflammation, to be checked regularly for Vitamin D status. Low BMD was common in IBD patients, and it does not correlate to laboratory indices. pQCT could be a useful tool to assess the bone status of IBD patient using very low radiation dosage.