Perspective

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Investigate Renal Function during Denosumab Therapy Using the Estimated Glomerular Filtration Rate Based On Cysteine

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Description

In Japan, oral bisphosphonates are currently used frequently to treat osteoporosis. Because bisphosphonates are only excreted through the kidneys, they may have a negative impact on kidney function both before and during treatment with bisphosphonates, especially when used for an extended period of time. Patients with a Creatinine Clearance (Ccr) of less than 30 mL/min should not receive any bisphosphonate treatment at all. Denosumab, a monoclonal antibody that targets the receptor activator of the nuclear factor-B ligand, has strong anti-resorption activity against osteoporosis because it inhibits osteoclastic function and differentiation from immature to mature osteoclasts. It is given once every six months to ensure better long-term patient compliance than oral bisphosphonates. Denosumab has lower unfriendly impacts on the kidneys than bisphosphonates as denosumab vanishes from the circulatory system subsequent to being debased in the spleen. In clinical practice, the assessed glomerular filtration rate in view of creatinine (eGFRcr) sometimes diminishes during osteoporosis drug treatment, including denosumab treatment.

Longitudinal Changes in Renal Function during Denosumab Therapy

eGFRcr is commonly used to measure renal function; Serum creatinine levels are influenced by muscle mass and diet, so the estimated Glomerular Filtration Rate (eGFRcys) is more accurate than the eGFRcr. Only one study has demonstrated longitudinal changes in renal function during denosumab therapy so far, in addition to a post-hoc analysis of controlled randomized trials of denosumab and the Fracture Reduction Evaluation of Denosumab in Osteoporosis Every 6 Months study. When Bone Mineral Density (BMD) decreases or new osteoporotic fractures occur during long-term bisphosphonate therapy, denosumab is frequently used in place of bisphosphonates. As a result, it is critical to determine whether denosumab therapy can be used in place of bisphosphonate therapy to preserve renal function. This study's primary objective is to investigate the two-year changes in renal function based on serum creatinine or cystatin C levels in women with osteoporosis who started denosumab therapy, including those who switched from long-term bisphosphonate therapy to denosumab therapy. This study's secondary objective is to determine whether patients who switched from bisphosphonate to denosumab therapy had higher BMD. We hypothesized that the BMD might rise when switching from bisphosphonate treatment to denosumab treatment and that renal function might be preserved when serum cystatin C levels were used instead of serum creatinine levels in both groups. The inclusion criteria were met by 117 women with osteoporosis in total. The new and switch bunches included 53 and 64 patients, separately.

Prevalence of a History of Fragility Fracture

In the switch group, oral alendronate, risedronate, and minodronate were the previous bisphosphonate treatments, with an average duration of 54.7 months. Denosumab was switched from minodronate or risedronate to more than 90% of patients in the switch group. Except for S–P1NP and U-NTX levels, there were no significant differences between the groups in age, body mass index, CCI, mobility status, or laboratory data. Due to prior bisphosphonate treatment, the switch group had significantly lower S–P1NP and U-NTX levels than the new group. The switch group had a significantly higher lumbar BMD than the new group; however, neither the total hip BMD nor the femoral neck BMD differed significantly between the groups. In comparison to the switch group, the prevalence of a history of fragility fracture and a recent fracture within three months prior to denosumab administration was significantly higher in the new group. Regarding the history of fragility fracture, the new group had more hip and vertebral fractures than the switch group. During denosumab treatment, all patients, including those in the switch group, maintained renal function. During denosumab treatment, patients with recent fractures should interpret creatinine-based renal function with caution.