

Meta-analysis on the effects of Romosozumab on bone mineral density in Osteoporosis; comparison of Fixed effects and Random effects models

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Osteoporosis is a bone illness characterized by a reduction of bone mineral density (BMD), bone mass as well as structural and quality deterioration of the bone tissue. This has a potential to result in weakening in the strength of bones which can increase fracture issues. Romosozumab is a monoclonal antibody, which is approved for treating osteoporosis and high fracture risk in postmenopausal women. This meta-analysis aimed to compare the random-effect model (REM) and the fixed-effect model (FEM) to estimate the effect of romosozumab on BMD in postmenopausal women suffering from osteoporosis. Conducting two systematic searches in accordance with PRISMA guidelines in PubMed, Clinicaltrials.gov, and Ovid, and then appropriate studies were selected. Mean percentage changes in BMD at the total hip (TH), lumbar spine (LS), and femoral neck (FN) after 12 months were extracted for every study. The outcome of the study was determined by taking the mean differences in BMDs between the two study groups. Four out of the 11 potentially eligible articles were incorporated into the meta-analysis for romosozumab. The results of the higher mean BMD changes in REM than the FEM show that REM is more applicable than the FEM, considering heterogeneity among studies. After 12 months, romosozumab treatment demonstrated a notable enhancement in mean percentage changes in BMD at the TH, LS, and FN. In conclusion, the REM is more appropriate than the FEM and, romosozumab considerably increases BMD at FN, TH, and LS after 12 months in postmenopausal women suffering from osteoporosis.

Keywords: Bone mineral density, fixed-effect model, meta-analysis, random-effect model, romosozumab

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