

Relationship between skeletal uptake of ^{99m}Tc -HMDP and bone mineral density in elderly women

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The relationship between bone mineral density in elderly women and the pattern of skeletal uptake of ^{99m}Tc -HMDP, especially in regard to skull uptake, was investigated.

The whole-body skeletal uptake (WBSU) and whole-body skeletal tracer distribution patterns were studied in 86 disease-free women on bone scintigraphy with ^{99m}Tc -hydroxy-methylene-diphosphonate (HMDP). Bone scans were quantified by setting regions of interest (ROI) and bone mineral density (BMD) was assessed by dual-energy X-ray absorptiometry in all patients. WBSU and the skeletal distribution pattern were compared with bone mineral densities of the entire skeleton as well as selected regions.

WBSU was high in the elderly and negatively correlated with regional bone mineral densities ($r = -0.403$ to -0.534). Among the regions, uptake by the skull increased with age more than in other regions in women and had the highest negative correlation with the bone mineral density. The skull uptake correlated negatively with total body BMD ($r = -0.583$) and with lumbar BMD ($r = -0.561$, $p < 0.0001$).

Our results show that increased radionuclide uptake in bone scintigraphy, especially skull uptake was associated with decreased bone mineral density in elderly women, so that, increased skull uptake in elderly women would be a scintigraphic sign of post-menopausal or senile osteopenia.

Key words: bone scintigraphy, skull, bone mineral density, osteoporosis, menopause