ORIGINAL ARTICLE

Annals of Nuclear Medicine Vol. 13, No. 6, 397–400, 1999

Effect of edetate calcium disodium on yttrium-90 activity in bone of mice

Naoyuki WATANABE,*,** Noboru ORIUCHI,* Shuji TANADA,* Hajime MURATA,*
Tomio INOUE,** E. Edmund KIM,*** Yasuhito SASAKI* and Keigo ENDO**

*Division of Advanced Technology for Medical Imaging, National Institute of Radiological Sciences
**Department of Nuclear Medicine, Gunma University School of Medicine
***Department of Nuclear Medicine, The University of Texas M.D. Anderson Cancer Center, Houston, Texas, USA

The kinetics of Yttrium-90 (Y-90) in bone of mice was investigated in combination with edetate calcium disodium ($CaNa_2EDTA$). One group of mice were intraperitoneally administered 37.5 mg/kg $CaNa_2EDTA$ or 0.9% NaCl as a control at 1, 22, 34, 46, 58, 70, 82, 94, 154 and 166 h after injection of Y-90 acetate (post-administration), and the biodistribution was studied at 3, 24, 72, 120 and 168 h postinjection of Y-90 acetate. No difference between the post-$CaNa_2EDTA$-treated mice and the control was demonstrated in the radioactivity in the bone. A decrease in radioactivity in the liver and kidneys was accelerated, and the radioactivity was lower than the control at 120 h postinjection. The other group of mice were also given the same dose of chelator at 12 h and 1 h preinjection of Y-90 acetate and at 1, 22, 34, 46, 58, 70, 82, 94, 154 and 166 h after injection of Y-90 acetate (pre- and post-administration), the radioactivity in bone at 3 h postinjection was significantly lower than in the control (24.4 ± 3.92% ID/g vs. 31.7 ± 2.26% ID/g, $p < 0.05$), but the decrease was not sequential. A significant reduction in radioactivity in the blood, kidneys and liver was demonstrated at 3 h, 72 h and 72 h postinjection. In conclusion, the $CaNa_2EDTA$ with the administration schedule employed here cannot chelate the Y-90 from bone but the free Y-90 before deposition into bone.

Key words: edetate calcium disodium, bone uptake