

Absorbed Dose Estimation of ^{68}Ga -EDTMP in Human Organs

Authors : S. Zolghadri, H. Yousefnia, A. R. Jalilian

Abstract : Bone metastases are observed in a wide range of cancers leading to intolerable pain. While early detection can help the physicians in the decision of the type of treatment, various radiopharmaceuticals using phosphonates like ^{68}Ga -EDTMP have been developed. In this work, due to the importance of absorbed dose, human absorbed dose of this new agent was calculated for the first time based on biodistribution data in Wild-type rats. ^{68}Ga was obtained from $^{68}\text{Ge}/^{68}\text{Ga}$ generator with radionuclidic purity and radiochemical purity of higher than 99%. The radiolabeled complex was prepared in the optimized conditions. Radiochemical purity of the radiolabeled complex was checked by instant thin layer chromatography (ITLC) method using Whatman No. 2 paper and saline. The results indicated the radiochemical purity of higher than 99%. The radiolabelled complex was injected into the Wild-type rats and its biodistribution was studied up to 120 min. As expected, major accumulation was observed in the bone. Absorbed dose of each human organ was calculated based on biodistribution in the rats using RADAR method. Bone surface and bone marrow with 0.112 and 0.053 mSv/MBq, respectively, received the highest absorbed dose. According to these results, the radiolabeled complex is a suitable and safe option for PET bone imaging.

Keywords : absorbed dose, EDTMP, ^{68}Ga , rats

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