

Estimated Human Absorbed Dose of ^{111}In -BPAMD as a New Bone-Seeking Spect-Imaging Agent

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Abstract : An early diagnosis of bone metastases is very important for providing a profound decision on a subsequent therapy. A prerequisite for the clinical application of new diagnostic radiopharmaceutical is the measurement of organ radiation exposure dose from biodistribution data in animals. In this study, the dosimetric studies of a novel agent for SPECT-imaging of bone methastases, ^{111}In -(4- $\{[(\text{bis}(\text{phosphonomethyl}))\text{carbamoyl}]\text{methyl}\}$ -7,10-bis(carboxymethyl)-1,4,7,10-tetraazacyclododec-1-yl) acetic acid (^{111}In -BPAMD) complex, have been estimated in human organs based on mice data. The radiolabeled complex was prepared with high radiochemical purity at the optimal conditions. Biodistribution studies of the complex were investigated in male Syrian mice at selected times after injection (2, 4, 24 and 48 h). The human absorbed dose estimation of the complex was performed based on mice data by the radiation absorbed dose assessment resource (RADAR) method. ^{111}In -BPAMD complex was prepared with high radiochemical purity >95% (ITLC) and specific activities of 2.85 TBq/mmol. Total body effective absorbed dose for ^{111}In -BPAMD was 0.205 mSv/MBq. This value is comparable to the other ^{111}In clinically used complexes. The results show that the dose to critical organs the complex is well within the acceptable considered range for diagnostic nuclear medicine procedures. Generally, ^{111}In -BPAMD has interesting characteristics and can be considered as a viable agent for SPECT-imaging of the bone metastases in the near future.

Keywords : In-111, BPAMD, absorbed dose, RADAR

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