Production and Quality Control of a Novel 153Sm-Complex for Radiotherapy of Bone-Metastases

Authors : H. Yousefnia, R. Enayati, M. Hosntalab, S. Zolghadri, A. Bahrami-Samani

Abstract : Bone metastases occur in many cases at an early stage of the tumour disease, however their symptoms are recognized rather late. The aim of this study was the preparation of 153Sm-(4-{[bis-(phosphonomethyl))carbamoyl]methyl}-7,10-bis(carboxymethyl) 1,4,7,10-tetraazacyclododec-1-yl) acetic acid (BPAMD) for bone pain palliation therapy. 153Sm was produced at Tehran research reactor via 152Sm(n,γ)153Sm reaction. 200 µl of 1mg/ml BPAMD solution was added to the vial containing 1 mCi 153Sm and the mixture was heated up to 90 0C for 1 h. The radiochemical purity of the complex was measured by ITLC method. The final solution with radiochemical purity of more than 95% was injected to BALB mice and bio distribution was determined up to 48 h. SPECT images were acquired after 2 and 24 h post injection. While high bone uptake was confirmed by both the bio distribution studies and SPECT imaging, accumulation in other organs was approximately negligible. The results show that 153Sm-BPAMD can be used as an excellent tracer for bone pain palliation therapy.

Keywords : bone metastases, BPAMD, 153Sm, radiotherapy
Conference Title : ICRR 2015 : International Conference on Radiopharmacy and Radiopharmaceuticals
Conference Location : Madrid, Spain
Conference Dates : March 26-27, 2015