

Quality Control of ^{99m}Tc -Labeled Radiopharmaceuticals Using the Chromatography Strips

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Abstract : ^{99m}Tc -2-methoxy-isobutyl-isonitrile (MIBI) and ^{99m}Tc mercaptoacetylglucylglycyl-glycine (MAG3) are heat to 368-372K and are labeled with ^{99m}Tc -pertechnetate. Quality control (QC) of ^{99m}Tc -labeled radiopharmaceuticals is performed at hospitals, using liquid chromatography, which is difficult to perform in general hospitals. We used chromatography strips to simplify QC and investigated the effects of the test procedures on quality control. In this study is ^{99m}Tc - MAG3. Solvent using chloroform + acetone + tetrahydrofuran, and the gamma counter was ARC-380CL. The changed conditions are as follows; heating temperature, resting time after labeled, and expiration year for use: which were 293, 313, 333, 353 and 372K; 15 min (293K and 372K) and 1 hour (293K); and 2011, 2012, 2013, 2014 and 2015 respectively were tested. Measurement time using the gamma counter was one minute. A nuclear medical clinician decided the quality of the preparation in judging the usability of the retest agent. Two people conducted the test procedure twice, in order to compare reproducibility. The percentage of radiochemical purity (% RCP) was approximately 50% under insufficient heat treatment, which improved as the temperature and heating time increased. Moreover, the % RCP improved with time even under low temperatures. Furthermore, there was no deterioration with time after the expiration date. The objective of these tests was to determine soluble ^{99m}Tc impurities, including ^{99m}Tc -pertechnetate and the hydrolyzed-reduced ^{99m}Tc . Therefore, we assumed that insufficient heating and heating to operational errors in the labeling. It is concluded that quality control is a necessary procedure in nuclear medicine to ensure safe scanning. It is suggested that labeling is necessary to identify specifications.

Keywords : quality control, tc- 99m labeled radio-pharmaceutical, chromatography strip, nuclear medicine

Conference Title : ICCPE 2016 : International Conference on Chemical and Process Engineering

Conference Location : Havana, Cuba

Conference Dates : November 24-25, 2016