Comparison of Radioactivity measurement with ^{99m}Tc and ^{123}I in Nuclear Medicine Centers

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Abstract

To investigate the level of measurement performance of radionuclide calibrator and to provide the participants with a traceable standard to check and review their calibration factors , Korea Food & Drug Administration (KFDA) as a national secondary standard dosimetry laboratory conducted comparison program for ^{99m}Tc and ^{123}I in nuclear medicine centers.

72 nuclear medicine centers (78 calibrators) participated in the comparison program for ^{99m}Tc in 2003 and 37 centers (41 calibrators) for ^{123}I in 2004. For a comparison, ^{99m}Tc and ^{123}I were accurately sub-divided into a series of 4 *ml* aliquots in 10 *ml* P6 vial and delivered to participants. Participants were invited to assay their P6 vial in each of their radionuclide calibrators and to report their results directly to KFDA. For the evaluation of raionuclide callibrator, KFDA used NPL-CRC radionuclide calibrator that is traceable to NPL (National Physical Laboratory, UK) primary standard.

The difference between the value reported by the hospital ($A_{hospital}$) and of the KFDA (A_{KFDA}) is expressed as a percent deviation (DEV (%) = 100 × ($A_{hospital}$ − A_{KFDA})/A_{KFDA}). If there were calibrators over 10 % deviations, those were checked again with the same procedure. In ^{99m}Tc, 65 % of the calibrators showed deviations within ±5 % and 18 % were in the range of 5 %<DEV≤10 %, and 17 % were over 10 % deviations. ^{123}I, 41 % of the calibrators were within ±5 % and 29 % were in the range of 5 %<DEV≤10 % and 30 % were over 10 %.