

Summary

Investigation of Radiation Safety Management at Nuclear Medicine Facilities in Japan; Contamination of Radioactivity in the Draining-Water System

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Radiation-safety management condition in Japanese nuclear medicine facilities were investigated by the questionnaire method. The first questionnaire was asked in all Japanese 1,401 Nuclear Medicine facilities. Answers from 624 institutes (44.5%) were received and analyzed. The radiation-safety management in nuclear medicine institutes was considered to be very well performed everyday. Opinion for the present legal control of nuclear medicine institutes was that the regulation in Japan was too strict for the clinical use of radionuclides. The current regulation is based on the assumption that 1% of all radioactivity used in nuclear medicine institutes contaminates into the draining-water system. The second questionnaire detailing the contamination of radioactivity in the draining-water system was sent to 128 institutes, and 64 answers were received. Of them, 42 institutes were considered to be enough to evaluate the contamination of radioactivity in the draining-water system. There was no difference between 624 institutes answered to the first questionnaire and 42 institutes, where the radioactivity in the draining-water system was measured, in the distribution of the institute size, draining-

water system equipment and the radioactivity measuring method, and these 42 institutes seemed to be representative of Japanese nuclear medicine institutes. Contamination rate of radioactivity into the draining system was calculated by the value of radioactivity in the collecting tank divided by the amount of radionuclides used daily in each institute. The institutes were divided into two categories on the basis of nuclear medicine practice pattern; type A: *in-vivo* use only and type B: both *in-vivo* and *in-vitro* use. The contamination rate in 27 type A institutes did not exceed 0.01%, whereas in 15 type B institutes the contamination rate distributed widely from undetectable to above 1%. These results indicated that the present regulation for the draining-water system, which assumed that 1% of all radioactivity used in nuclear medicine institutes contaminated into draining-water system, should be reconsidered in nuclear medicine facilities where radionuclides are used only in *in-vivo* studies.

Key words: Radiation-safety management, Questionnaire method, Contamination rate into draining-water system.