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The environmental dose measurements of high dose Iodine-131 treated thyroid cancer patients during hospitalization period

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Radioiodine mostly 131I is one of the oldest clinical radionuclide types which used widely spread in diagnosis and currently used in the treatment of both thyreotoxicosis and thyroid cancer. For most thyroid cancer treatments, large doses of 131I are administered to ablate residual thyroid tissue and functional metastases from thyroid cancer. Because of radiation safety considerations, application of large doses of 131I (greater than 800 MBq) requires patient hospitalization. For most patients, 35%-75% of the administered dose is excreted within the first 24 hours after dose administration. This study presents the risks associated with high dose 131I treatment which is used in nuclear medicine. Patients were confined to two isolation rooms which were completely covered with lead. Each room is designed for two beds which are separated by lead separators. In the fixed activity protocol, a high activity 3.7-7.4 GBq (100-200 mCi) ^{131}I was administered to12 patients. In general, the patients were isolated for a period of 2-3 days. The dose rates were measured at 1 m from the patient's thyroid and abdominal levels at different interval times. The clean and unclean room dose rate measurements were performed at each isolated room. These were 0.43±0.56 mRh-1 and 1.49±1.99 mRh-1 respectively. The maximum dose rate was measured at the toilet bowl. Moreover the pillow had 5.02±4.35 mRh-1 at the unclean room. Surrounding rooms and service door-corridor measurements were done with patients 7.06±10.33 µRh-1 and 87.75±91.87 µRh-1 respectively and without patients 1.17±8.84 µSvh-1 and 32.92±12,98 µRh-1 respectively.

Biography

Nina Tunçel has completed her PhD from Istanbul University Oncology Institutes in Medical Radiation Physics. She is the Chief Medical Physicist from 1999 to 2013 at Akdeniz University Medical School, Radiation Oncology Department. She has started her career as teaching staff for training Medical Physics at Physics Department of Science Faculty of Akdeniz University. She has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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