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The application of ultrasound irradiation technique for the reconstitution of radiopharmaceutical kits

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Sonochemistry is a branch of chemical research dealing with the application of ultrasound waves. Green chemistry has successfully improved the yield of the reactions, changed the reaction pathway or initiated the reaction. Technetium 99m 2-methoxy isobutyl isonitrile is a lipophilic cation complex that has been accumulated in viable myocardial tissue by passive diffusion into myocyte with subsequent binding to the mitochondria within the cell. This radiotracer has been demonstrated suitable characteristics for myocardial perfusion studies. The freeze dried kit of sestamibi contains 2-methoxy isobutyl isonitirle (Sestamibi) as a performed copper (I) complex, which facilitates labeling by ligand exchange at elevated temperature. The labeling process of MIBI as a conventional method is time-consuming. It is highly desirable to reduce the time of labeling process particularly in emergency situations in clinical practice. In our previous study, 37 MBq(1mCi) ^{99m}Tc-MIBI samples with appropriate yields could be reconstituted under ultrasound irradiation technique. Then the activity was scaled up to the amounts that could be used for myocardial perfusion imaging. The new developed technique has been suggested for preparation of ^{99m}Tc-MIBI in clinical practice. We continued our achievement to the other radiopharmaceutical kit which the reconstitution is time-consuming in nuclear medicine departments.

Biography

Alireza Doroudi has completed his PhD in 2005 from Tehran University of Medical Sciences. He is a Radiopharmacist, Associated Professor and Director of research team focusing on new developed technique for reconstitution kits, preparation of new radiotracer for diagnosis of infection and bone pain palliation therapy and synthesis of new radiosensitizer compounds. He has published more than 20 papers in reputed journals.

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