LETTERS TO THE EDITOR

SIMPLE PROCEDURE FOR MICROWAVED TECHNETIUM-99M SESTAMIBI TEMPERATURE REDUCTION

To the Editor: The recently approved radiopharmaceutical, technetium-99m-2-methoxy isobutyl isonitrile (^{99m}Tc-sestamibi) has been demonstrated to be a very useful agent for myocardial perfusion imaging. In cases of patients experiencing acute myocardial conditions (e.g., spontaneous chest pain or acute myocardial infarction), ^{99m}Tc-sestamibi must be readily available. The availability of ^{99m}Tc-sestamibi is severely limited on an emergency basis due to the lengthy preparation time and the necessity of conducting a radiochemical purity (RCP) analysis as stated in the manufacturer's package insert *(1)*. The use of a combination of a microwave oven heating method and a mini-paper chromatography system (MPC) has overcome these two limiting factors, therefore making ^{99m}Tc-sestamibi more readily available for emergency use *(2)*.

The microwave oven provides a faster method for heating the kit, and when used in conjunction with the MPC system, allows preparation and administration of ^{99m}Tc-sestamibi to be completed within 5 min. However, one potential problem with this procedure is that the final temperature of the 3 ml of solution inside the vial after 10 sec of microwave heating was 106.8±3.8°C (n=19) *(2)*. After the MPC was completed 2–3 min later, the solution was still too warm for patient injection (62.3±1.0°C, n=6). One possible solution is to refrigerate the ^{99m}Tc-sestamibi kit while RCP analysis is being performed to reduce the solution temperature to an acceptable level *(3)*.

The use of refrigeration for rapid temperature reduction of ^{99m}Tc-sestamibi raises a number of concerns: (1) possible formation of unknown precipitate or impurity; (2) possible reduction of the labeling efficiency; (3) possible damage to the ^{99m}Tc-sestamibi solution if it freezes; (4) possible vial breakage due to the rapid change in temperature; and (5) additional complexity of the preparation process.

We propose that a more practical and convenient method for reducing the temperature of ^{99m}Tc-sestamibi is possible without the use of refrigeration. After heating the kit in the microwave oven, while the RCP analysis was performed with the MPC method, we drew up a unit-dose (0.5 ml or 1 ml) of ^{99m}Tc-sestamibi in a 3-ml syringe. The syringe was placed in a syringe shield at room temperature and was not moved during RCP determination. Immediately after the RCP was determined (3 min), a temperature measurement of the solution in the shielded syringe was taken. The average temperature of a 0.5-ml solution in the 3-ml syringe was 31.1±0.9°C (n=10), and for 1.0-ml solution it was 34.6±1.3°C (n=10). These temperatures are well within an acceptable range for injection of a patient. We think that a large surface area compared to the small volume of ^{99m}Tc-sestamibi in the syringe is the major factor responsible for the rapid temperature reduction. In addition, the lead syringe shield also facilitates the heat dissipation.

Based on our findings, we recommend employment of this method for temperature reduction of ^{99m}Tc-sestamibi prior to injection, especially in emergency cases when rapid administration of ^{99m}Tc-sestamibi is required. This method of preparing the patient dose while the MPC is developing is the simplest and most efficient procedure for ^{99m}Tc-sestamibi temperature reduction, allowing timely administration of this radiopharmaceutical.

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REFERENCES

1. Cardiolite® package insert. E.I. du Pont de Nemours & Co. Billerica, MA. December 20, 1990.
2. Hung JC, Wilson ME, Brown ML, Gibbons RJ. Rapid preparation and quality control method for technetium-99m-2-methoxy isobutyl isonitrile (technetium-99m-sestamibi). *J Nucl Med* 1991;32:2162-2168.
3. Gagnon A, Taillefer R, Bavaria G, Léveillé J. Fast labeling of technetium-99m-sestamibi with microwave oven heating. *J Nucl Med Technol* 1991;19:90–93.

RELIABILITY OF MULTIPLE INSTRUCTOR GRADING IN A RESEARCH COURSE

To the Editor: In an article written for the *Journal of Nuclear medicine Technology (1)*, the perceived need to teach nuclear medicine technology students how to conduct research was studied at the University of Nebraska Medical Center in Omaha, Nebraska, and a description of the formal class was included. This class was taught to students in nuclear medicine technology, diagnostic medical sonography, radiography, and radiation therapy technology. During the course each student generated a research proposal under the direction of a mentor.

One of the potential problems discussed in the article was the amount of grading for one instructor. Since this article was published, more students have enrolled in the course. Physical therapy students have joined the course so that total registration in each course is around 50. This number necessitated examining whether more than one instructor could share in grading the proposals and maintain consistency. Therefore, a study was conducted where four separate allied health faculty independently read and graded course material. One of the faculty members was the coordinator of the course and normally gave the students their grades. The faculty came from four disciplines: nuclear medicine technology, radiography, medical technology, and physical therapy. Reviews of 18 students were completed.

Each student was graded anonymously on three separate written contributions to the proposal. The first paper consisted of the research idea, while the second one was the selection of references and their abstracts. The third paper consisted of identifying the