NRCP Research Journal
Vol. 3, No. 2, July-September, 1993

THE DEVELOPMENT OF TECHNETIUM - 99m RADIOPHARMACEUTICALS: TECHNETIUM -99m PHYTATE

A.D. EUGENIO, E.M. DE JESUS, Ma.T.A. SALABIT
and L.F. MENDOZA
Philippine Nuclear Research Institute
Diliman, 1101 Quezon City

ABSTRACT

A kit for scintigraphy of the reticuloendothelial system has been prepared. It provides a predispensed sterile formulation for reconstitution with sterile ^{99m}TC-pertechnetate solution. The resulting injection contains ^{99m}TC labelled phytate. Each kit consists of 3 vials and each vial contains 10 mg phytate and up to 1 mg $SnCl_2$ $2H_2O$ in freeze-dried form.

INTRODUCTION

Although ^{99m}Tc sulfur colloid is widely used for liver scanning it suffers from the disadvantage that its preparation is time-consuming and requires the use of trained personnel. Such a kit which avoids the drawbacks of ^{99m}Tc sulfur colloid can be prepared from sodium phytate containing stannous chloride and ^{99m}Tc pertechnetate solution.

In 1973, Subramanian, *et al.* first proposed and carried out the labelling of Sn phytate with ^{99m}Tc and subsequently used this complex as a liver scintigraphic agent by allowing the administered ^{99m}Tc-Sn-phytate to form the insoluble calcium salt in vivo. The biological distribution in the reticuloendothetial organs may be controlled by the phytate to stannous ion concentration ratio and total quantity of phytate injected. With a 5:1 ratio in mouse 85-90% of radioactivity localizes in liver at 15-30 minutes.

The preparation appears to be quite soluble in that it can be sterilized by passage through a 0.22 micron membrane filter although electron microscopy shows the presence of some several particles (0.1 - 0.2 microns in diameter).

The exact composition and structure of the complexes formed are not known with certainty. The sequence of steps in preparation