Study of the Preparation of ^{99m}Tc-Technetium Compounds 2. Preparations of ^{99m}Tc-Human Serum Albumin ^{99m}Tc-Aggregated Albumin and ^{99m}Tc-Macroaggregated Albumin

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Although preparation methods for ^{99m}Tc-human serum albumin, ^{99m}Tc-aggregated human serum albumin and ^{99m}Tc-macroaggregated human serum albumin have been so far fully discussed by many people, we now wish to present here our own methods which we believe are able to be done more simply, safely and speedily.

Preparation method

(1) ^{99m}Tc-human serum albumin

Add 0.2 M of ascorbic acid and 0.1 M of ferric chloride to ^{99m}Tc-pertechnetate solution. Add human serum albumin to the above solution and incubate for 15 minutes at room temperature. Remove the unbound ^{99m}Tc by adding ionexchange resin, adjust the pH of solution and filtrate the solution by using milliporefilter.

(2) ^{99m}Tc-aggregated albumin and ^{99m}Tc-macroaggregated albumin

Prepare aggregated albumin from human serum albumin and label the aggregated albumin from human serum albumin and label the aggregated albumin with ^{99m}Tc by usual method. ^{99m}Tc-macroaggregated albumin is obtained by heating the above ^{99m}Tc-aggregated albumin at 80°C for 5 minutes.

Result

(1) ^{99m}Tc-human serum albumin

The whole procedure for labelling human serum albumin with ^{99m}Tc takes only thirty minutes. ^{99m}Tc-human serum albumin prepared by the above method (1) is stable for five hours even at room temperature. Organ distribution of ^{99m}Tc-human serum albumin in rats is in accord with that in rabbits which McAfee showed in his report, and is not in accord with that of ^{99m}Tc pertechnetate. Therefore we believe our ^{99m}Tc-human serum albumin is well usable for placenta scanning.

(2) The prevailing methods for ^{99m}Tc-aggregated albumin and ^{99m}Tc-macroaggregated albumin are the followings:–

(i) To prepare them directly from ^{99m}Tc-human serum albumin.

(ii) To prepare ^{99m}Tc-macroaggregated human serum albumin from unlabelled macroaggregated human serum albumin.

(iii) To prepare ^{99m}Tc-aggregated albumin from ^{99m}Tc-macroaggregated albumin by using supersonic waves.

Our preparation method seems to be more excellent than the above three kinds of methods because we need much less time for all preparation procedure and can obtain much higher yield. For example, through our method, we can obtain more than 70% of ^{99m}Tc-aggregated albumin from ^{99m}Tc-pertechnetate and the accumulation of ^{99m}Tc-aggregated albumin to rat's liver is more than 85%, and moreover accumulation of ^{99m}Tc-macroaggregated albumin to rat's lung is more than 95%.