Contribution ID: **43** Type: **not specified**

In-house radiocolloid development for sentinel lymph node detection

Background/Objective; Currently sentinel lymph node (SLN) dissection is an important procedure alongside to the tumour removal surgery especially for breast cancer. In general SLN can be localised with blue dye or radiocolloid. In Nuclear Medicine, several types of radiocolloid have been utilised such as 99mTc sulfur colloid, 99mTc nanocolloid including 99mTc dextran. One of the critical factors that influence the detection is the particle size of the radiocolloid because kinetic of the lymphatic system is strongly dependent on the size of colloid. The appropriated size should be less than 100 nm. Regarding cost of the commercial radiocolloid, the in-house radiocolloid has been required. Then, aims of this study were to develop and characterise the in-house radiocolloid kit for SLN detection.

Methodology; The in-house dextran kit was developed in a kit form which was contained dextran and reducing agent. Then 0.5 mL of the solution was dispensed into the evacuated vials and stored at -20oC until use. Approximately 3, 5 and 10 mCi Na99mTcO4 was labelled with the dextran kit in triplicate before the radiochemical purity (RP) was determined at 15 min, 3 h and 6 h post radiolabelling by instant thin layer chromatography (ITLC). The ITLC-silica gel and methyl ethyl ketone was used as a stationary and mobile phase, respectively. Size of the 99mTc dextran was evaluated using transmission electron microscope. To examine the shelf life, 3 frozen dextran kits were labelled with Na99mTcO4 5 mCi at 1, 3, 6 and 12 month after kit production and analysed for the RP. SLN detection using 99mTc dextran in breast cancer patients was retrospectively enrolled and compared with the blue dye technique.

Results and Discussion; The radiochemical purity of 3, 5 and 10 mCi 99mTc dextran were not altered after radiolabelling for 15 min, 3 h and 6 h which were greater than 98%. The transmission electron microscope result showed the non-uniformity of aggregation to form colloid with the diameter range of 15 nm to 40 nm offering the advantage for SLN detection. At the different storage times of 1, 3, 6 and 12 month, the RP results were 97.58 ± 0.33, 97.79 ± 0.52, 97.88 ± 0.33 and 98.09 ± 0.43, respectively. The concordance between blue dye and 99mTc dextran to detect SLN was comparable.

Conclusion; The in-house dextran kit showed the greater radiochemical purity than 98% over 6 h post radiolabelling with the Na99mTcO4 activity up to 10 mCi. The optimum particle size was revealed. Its shelf life was up to 12 months. SLN detected by in-house radiocolloid was comparable to that of blue dye in breast cancer patients. Therefore low cost in-house kit could be used in the routine service for sentinel lymph node detection.

Primary authors: Dr CHAROENPHUN, Putthiporn (Division of Nuclear Medicine, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University); Mr THONGKLAM, Kittipong (Division of Nuclear Medicine, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University); Mr WITTAYACHOKKITIKHUN, Siripong (Division of Nuclear Medicine, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University)

Presenter: Dr CHAROENPHUN, Putthiporn (Division of Nuclear Medicine, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University)

Session Classification: Poster Session