

ESTIMATION OF PERCENT DECREASE IN RADIOIODINE-131 DOSAGES DURING ADMINISTRATION TO PATIENTS

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Objectives

Many radiation workers have reported that some activities remain in the syringes of radioactive iodine-131 (RAI-131), after administration to thyroid patients. Such decrease in the RAI-131 activity, to be administered to patients would result in reduced quality of images, radiation exposure, radioactive waste, and financial burden.

The Purpose of this study is to measure the remaining activity in RAI-131 syringes, after administration to the patients.

Methods

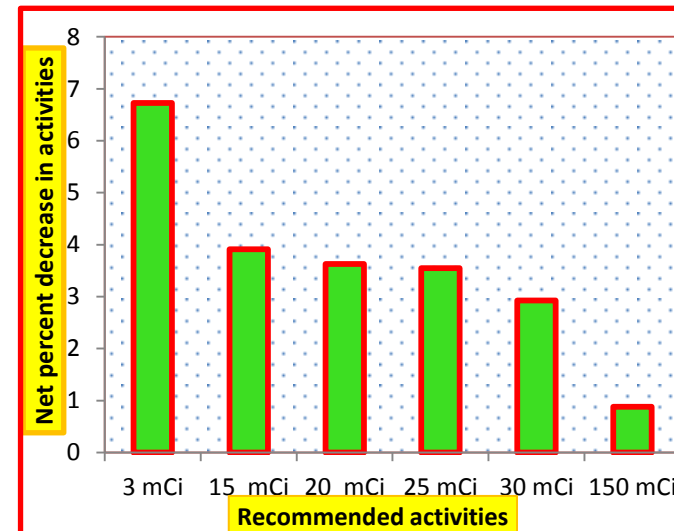
A total number of 180 patients were included in this study. All the recommended activities for all patients were measured with Capintech inc, CRC-25R dose calibrator as shown in the figure. the net percentage decrease in administered activities was measured for all patients.



Results

The mean measured RAI-131 activities were 3.05 (2.67, 4.12) mCi, 15.1 (14.1, 16) mCi, 20.08 (19, 21) mCi, 25.19 (24, 26.1) mCi, 29.9 (28.9, 31) mCi and 150.08 (148, 152) mCi for advised activities of 3 mCi, 15 mCi, 20 mCi, 25 mCi, 30 mCi and 150 mCi respectively. The mean percent error in the measurements were -1.63 (-37.33, 11) %, -0.69 (-6.69, 6) %, -0.41 (-5, 5) %, -0.76 (-4.4, 4) %, 0.33 (-3.33, 3.67) % & -0.054 (-1.33, 1.33) % respectively for aforementioned dosages. The corresponding mean value of remaining percent activities in the empty syringes after the administration were 8.36 (1.52, 14.29) \pm 3.22 %, 4.6 (1.6, 8.5) \pm 2.22 %, 4.05 (1.21, 7.29) \pm 1.50 %, 4.31(1.39, 7.17) \pm 1.69 %, 2.6 (0.77, 4.67) \pm 1.08 % and 0.93 (0.16, 2.12) \pm 0.52 %.

The net percent error in recommended activities by nuclear physicians and administered activities were 6.73 (-32.7, 20.95) \pm 11.15 %, 3.91 (-3.85, 8.77) \pm 2.94 %, 3.63 (-2.39, 7.79) \pm 2.51 %, 3.55 (-0.65, 10.67) \pm 2.6 %, 2.93 (-1.98, 6.78) \pm 1.89 % and 0.88 (-1.04, 2.68) \pm 0.87 % as shown in the graph.



Conclusions

This study concludes that patients receive on average less dosages than the recommended activities. This decrease in the activities needs to be adjusted for the patients in order to ensure best quality images and optimum dose delivery. This study also concludes that soft gel capsule of RAI-131 may be provided instead of liquid form of activity.