

AbstractID: 11237 Title: Internal Dosimetry Calculation to Red Marrow from ^{131}I -MIBG Treatment in Neuroendocrine Tumor Patients

Purpose: The aim of this study was to calculate absorbed dose to red marrow using patient-specific parameters in 14 patients with neuroendocrine tumor after administration of diagnostic dose (37 MBq) of ^{131}I -MIBG.

Methods and Materials: Whole body and blood clearance of ^{131}I -MIBG in each patient were measured with a gamma probe and gamma counting systems, respectively. The effective half-life, and residence time were derived from whole body retention and blood activity concentration curves. Dose to the red marrow was calculated by using the standard Medical Internal Radiation Dose (MIRD) schema.

Results: The mean effective half-life (23.5 h) determined from whole body measurements was higher than those derived from blood activity concentration (16.6 h). The whole body residence time was 33.9 ± 7.5 hours and the mean absorbed dose to red marrow was 0.25 ± 0.19 mGy/MBq. The calculated mean \pm SD of ^{131}I -MIBG treatment dose was 13.19 ± 9.18 GBq (n=14). After treatment, thrombocytopenia grade 1 occurred in 4 patients (29%) with a mean time to nadir of 22 days. Leukopenia grade 1 found in 2 patients (14%), grade 2 in 1 patient (7%), grade 3 in 1 patient (7%) and grade 4 in 1 patient (7%) with a mean time to nadir of 48 days.

Conclusions: The red marrow dosimetry estimated from patient specific data with a diagnostic dose of ^{131}I -MIBG was a good predictor for potential marrow toxicity. The use of this standardized calculation methodology should ultimately improve the planning for ^{131}I -MIBG treatment in neuroendocrine tumor patients.