

AbstractID: 9392 Title: Internal dosimetry of iodine 131 in patients with thyroid carcinoma in the Instituto Nacional de Cancerologia, Bogota-Colombia

PURPOSE: with the purpose of determining the iodine 131 biodistribution in patients with thyroid cancer, a patient-specific dosimetry protocol was developed and applied, using the administration of a tracer amount of this radionuclide and the methodology of the Medical Internal Radiation Dose. The dosimetry method consists in a determination of the maximum tolerated activity that will deliver 2 Gy to the blood, and the corresponding ablative lesion dose. **METHOD AND MATERIALS:** fifteen patients with thyroid-stimulating hormone (TSH) level of 30 mU/L and a suppressed iodine diet were orally administered with a tracer activity (111 - 148 MBq). The activity determination in whole body, lungs, stomach, thyroid and metastatic targets were done using a region-of-interest (ROI) technique. Individual ROIs were drawn on both anterior and posterior projections at 2, 4, 24, 48 and 72 hours. Calculations were based on the geometric mean of anterior and posterior counts, including corrections for photon scatter, attenuation, septal penetration, and other effects in the gamma camera. **RESULTS:** the data were fitted to multicomponent exponential retention functions or in closed compartment models using the Organ Level Internal Dose Assessment (a software program OLINDA, Vanderbilt University), and, subsequently, the calculation of radiation absorbed doses to the different organs and tissues. **CONCLUSIONS:** The internal dosimetry method implemented has the advantage of being ambulatory and the tumor doses was prescribed for those cases in which tumor uptake give ablative lesion dose of 300 Gy. The internal dosimetry is useful in determine the optimal amount of administered activity in radioiodine therapy, so that the absorbed doses to the organs of interest turn out to be the optimal, without overcoming the maximum tolerated dose in red marrow and the maximum tolerated dose to the lungs.