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**Personal dose equivalent  $H_p(10)$  in patient's family members after  $^{131}\text{I}$  therapy in thyroid cancer and benign thyroid diseases**

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**Abstract:**

**Aim/Introduction:** The aim is to quantify the personal equivalent dose  $H_p(10)$  of the family members (FMs) of patients submitted to iodine-131 therapy (RAIT): thyroid cancer (TC) or benign thyroid diseases (BTD) and compare  $H_p(10)$  values of children and adults. **Materials and Methods:** An observational study was performed in FMs of patients treated in two hospitals (83 FMs of 48 patients). After receiving instructions on radiation protection, based on Euratom recommendations, all FMs used a whole body thermoluminescent dosimeter (TLD) during 21 days. The FMs were divided in two groups: TC-Group, 65 FMs (5 children <10 y) of 37 patients treated for TC (average activity = 3369.6 MBq; range 1110-5920 MBq); BTD-Group, 18 adults FMs of 11 patients treated for BTD (average activity = 365.4 MBq; range 185-555 MBq). The TC patients were discharged 48h after therapy and BTD patients were treated as ambulatory patients. All ethical principles of the investigation were respected. **Results:** In the TC-Group, FMs had an Body Mass Index (BMI) of  $26.1 \pm 5.5 \text{ Kg.m}^{-2}$  and the mean of  $H_p(10)$  was 0.14 mSv (range 0.00-3.37 mSv). At discharge, patients in this group had a mean effective dose rate measured at 1 meter distance of  $10.4 \mu\text{Sv.h}^{-1}$  (range 2-28  $\mu\text{Sv.h}^{-1}$ ). In the BTD-Group, FMs had a BMI of  $26.8 \pm 3.7 \text{ Kg.m}^{-2}$  and the mean of  $H_p(10)$  was 0.37 mSv (range 0.01-2.40 mSv). The  $H_p(10)$  value correlated with the degree of relationship and the age of the FMs. In both groups, the  $H_p(10)$  of the FMs showed a moderate correlation to the RAIT activity ( $\rho_{sp} = -0.450$ ;  $p = 0.010$ ) and no correlation with patients effective dose rate ( $\rho_{sp} = 0.171$ ;  $p = 0.173$ ) or BMI of FMs ( $\rho_{sp} = -0.074$ ;  $p = 0.585$ ). In the TC-Group a moderate correlation was found between the effective dose rate and the RAIT activity administered ( $\rho_{sp} = 0.342$ ;  $p = 0.009$ ) and a non-statistically significant correlation between the effective dose rate and the BMI ( $\rho_{sp} = 0.237$ ;  $p = 0.088$ ). CI 95%. **Conclusion:** The FMs of the patients submitted to RAIT for BTD received higher doses when compared to FMs of TC patients. The  $H_p(10)$  of the FMs was correlated to the degree of relationship and the age of the FMs. In the patients submitted to  $^{131}\text{I}$  therapy for TC or BTD, the  $H_p(10)$  of the FMs is associated to the  $^{131}\text{I}$  administered activity. It is important to underline that the personal dose equivalent in these FMs does not reach the limits recommended by ICRP 97 and ICRP 94. **References:** none

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Author Disclosure Information:

**M.J. Carapinha:** None.

**Topic (Complete):** Radiation exposure & protection

**Disclosures (Complete):**

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