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ASSESSMENT OF THE EXPOSURE TO IONIZING RADIATIONS IN RADIOLOGIC TECHNOLOGIST STUDENTS

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BACKGROUND-AIM

The question of exposure to ionizing radiation in health care has always been highly considered and debated. The aim of the present study was the assessment of the Bachelor Radiology Technologist (BRT) students' exposure to ionizing radiations and the efficacy of monitoring respect to the radiological protection principles and law limits.

METHODS

The monthly exposure of 87 students attending the three years course of BRT at University of Bari, Italy was evaluated. The practical training with ionizing radiations exposition consists in 500 hours of per year. The exposure assessment was conducted using data recorded by the personal dosimetry respectively by chest film badge dosimeter and wrist badge dosimeter. Variables collected are: exposure (YES/NO) for each month, effective dose per month (chest dosimete; μSv), hands exposure (YES/NO) per month, hands equivalent dose per month (wirst dosimeter; μSv), total effective dose per year (chest dosimeter; μSv), total hands equivalent dose per year (wirst dosimeter; μSv), number of potential exposures per year (months), effective dose per month of exposure, hands equivalent dose per month of exposure. χ^2 test was applied and Analysis of Variance was performed to compare mean levels of effective dose among the areas of training.

RESULTS

We analyzed a total of 2701 monthly detections. About the annual effective doses recorded by the chest film-badge, 235/270 (87%) dose values were lower than 20 μSv (minimum limit of dose detection) and 35 (13%) were greater. In 35 dose values greater than 20 μSv, the minimum effective dose was 23 μSv, the maximum was 510 μSv and the mean effective dose was 141.48 μSv. About the annual hands equivalent doses, detected by TLD dosimeter, 195/206 (94%) dose values were lower than 20 μSv and only 11 (6%) greater than 20 μSv. 2,701 monthly detections of the effective doses were performed. Only 1.52% of the detections was higher than the 20 μSv so 4 classes of effective doses were distinguished: <= 20, 21-100, 101-250, >=251. The frequency of dose greater than 20 μSv in the three training areas is not statistically significantly different (χ^2 = 1.93 p = 0.38). Considering only the 41/2701 detections greater than 20 μSv, the mean levels of effective dose didn't result significantly different among the training areas (F=1.23 p=0.29). No association among the years of attendance and the effective doses (lower or greater than 20 μSv) resulted statistically significant (χ^2 =2.77 p=0.43).

CONCLUSION

The results of this study demonstrate that students have a very limited radiation exposure with levels of effective dose are lower than those prescribed for workers of B category. This could be due to the less exposure time than a normal work schedule and to the application of safety standards for radiation protection that students acquire during their curriculum. The respect of the rules of radiological protection drastically reduces the possibility of exposure.