AbstractID: 12881 Title: Comparative study of US and Brazilian data of unshielded primary air kerma per patient

PURPOSE

According to NCRP 147 (2004), the quantity unshielded primary air kerma per patient at 1m (K_P^1) must be used during shielding design for radiological facilities. Although the publication suggests some values, these are based on North-American clinical routine. Because of this fact, the present study aims to provide estimation of Brazilian values of this quantity.

METHODS AND MATERIAL

A survey of 2213 values of workload (W - [mA.min / week]), patient workflow (N - [patients/week]) and tube output were conducted. The data was originated on 2002 radiometric and quality control reports performed during the period of 1999 to 2009. Forty-three different institutions, located in the southern and southeastern of Brazil participated in this analysis.

Average workload normalized per patient (W_{norm} - [mA.min / patient]) and tube output (R - [mGy/mA.min]) were calculated by means of statistical quantifying methods of the central tendency and data dispersion. These data were grouped in 15 clinical modalities.

RESULTS

It was obtained the values of W_{norm} equals to (1.33 ± 6.35) mA.min.pac $^{-1}$ for conventional radiology to and (0.56 ± 0.40) mA.min.pac $^{-1}$ for chest examinations. These values differs on -27.5% and -6.7% compared to the NCRP 147 data. In contrast, mammography presented values of (10.00 ± 18.77) mA.min.pac $^{-1}$ against (6.69 ± 3.40) mA.min.pac $^{-1}$ from NCRP 147. Using the obtained results for the calculation of K_p^1 and comparing them with the values suggested by the NCRP 147, differences of 18.7% for conventional radiology and -17.7% for chest x-rays were found.

CONCLUSION

Studies around national adaptation of international protocols are important to avoid systematic and unrealistic practice. This study allowed the observation of significant differences compared to NCRP 147 standards, especially in modalities such as mammography. This evaluation also provided information on other modalities, such as interventional radiology, dentistry and veterinary medicine.