Radiation Exposure In Interventional Procedures

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Abstract:

The aim of this study was to estimate radiation doses patients and staff are exposed to during interventional procedures (IPs), compare them with the international diagnostic reference levels and to develop initial National Diagnostic Reference Levels. The IP survey was undertaken as the initial task of which, retrospective data were collected from the only four Kenyan hospitals carrying out interventional radiology and cardiology procedures at the time of the study. Real-time measurement of radiation dose to patients and staff during these procedures was done. To the patients, kerma-area product (KAP) and fluoroscopy time measurements were done using an in-built KAP meter, while peak skin dose (PSD) was measured using slow Extended Dose Range (EDR2®) radiographic films. The staff occupational doses were measured using individual thermoluminescence dosemeters. The maximum and minimum KAP values were found to be 137.1 and 4.2 Gy cm2, while the measured PSD values were 740 and 52 mGy, respectively. The fluoroscopic time range was between 3.3 and 70 min. The staff doses per procedure ranged between 0.05 and 1.41 mSv for medical doctors, 0.03 and 1.16 mSv for nurses, 0.04 and 0.78 mSv for radiographers and 0.04 and 0.88 mSv for clinical staff. The measured patient PSDs were within the threshold limit for skin injuries. However, with the current few IP specialists, an annual increase in workload as determined in the study will result in the International Commission on Radiation Protection annual eye lens dose limit being exceeded by 10 %. A concerted effort is required to contain these dose levels through use of protective gear, optimisation of practice and justification.