Abstract

ASSESSMENT OF RADIATION EXPOSURE DURING INTERVENTIONAL PROCEDURES IN KENYA

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Background: The increasing number of interventional procedures in Kenya benefits many patients and results in radiation burden. Some patient radiation dose studies in developed countries have reported patients' cumulative skin dose exceeding the thresholds causing skin erythema. To ensure safety, there is a need in Kenya for training on operational monitoring and recording of patient radiation exposure.

Objective: To quantify ionizing radiation exposure to patient during interventional procedures and establish national diagnostic reference levels (NDRLs) for clinical radiation management.

Methodology: The cumulative reference point air kerma, kerma area product, fluoroscopy time and other operational parameters were monitored for 50 children and 261 adult patients procedures in five catheterization laboratories in Kenya.
To estimate the risk associated with the exposure, effective doses were derived from kerma area product using conversion factors from Monte Carlo models.

Study Design: Cumulative reference point air kerma, kerma area product, fluoroscopy time measurements recorded at the only five catheterization facilities in Kenya.

Results: About 3% of the measured cumulative reference point air kerma for the interventional procedures approached the threshold dose limit for deterministic effects. In interventional cardiology, the results obtained for both children and adults indicated that 33% were below the DRLs for each of the following; cumulative reference point air kerma, kerma area product, and fluoroscopy time. The respective figures in adult interventional radiology were 29%, 43%, and 43%.

Conclusion: The measured patient doses were above the available DRLs in the literature indicating a need for optimization continuous monitoring and recording of patient dose.

Recommendation: To promote radiation safety, catheterization facilities need to establish a radiation monitoring notification threshold in addition to the use of the newly established NDRLs as a quality assurance tool.