

Assessment of effective dose in hybrid imaging

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Aim

The aim of this study is to assess the typical doses associated with PET/CT examination in a large population and to evaluate the difference of effective dose estimation in fixed vs patient-adapted activity utilizing the same imaging protocols. Doses differences in the urinary bladder are also estimated for PET examination.

Material and Method

DoseWatch™ tracking system was utilized to collect patient information and to measure effective dose (for WB 18F-FDG PET/CT) and organ dose data (for PET only) associated with a fixed activity by retrospectively analyzing existing data. For CT examination DLP values and effective dose data was collected; for PET examination DoseWatch™ provides the administered activity, the effective and the organ doses, based on ICRP 106. Effective and organ dose (for PET only) in a PET/CT examination where the administered activity is adapted to the patient's weight will be estimated from the same database using a theoretical calculation. The dose in the urinary bladder is also assessed on theoretical calculations.

Result

Dose data from 6900 CT and 1700 WB 18F-FDG PET were collected. CT mean DLP (mGy*cm) data values were: 1481.3 (76.1-7700.9) and mean effective doses (mSv): 15.2±4.9. Mean administered activities (MBq) and effective doses (mSv) for 18F-FDG PET are: 333.9-6.4. The mean total effective doses (mSv) due to both modality are: 21.5±5.2. equivalent doses (mSv) to urinary bladder are: 43.7±5.8.

Conclusion

The implementation of a dose tracking system in nuclear medicine is of great value for accurate and regular recording, reporting and analysis of patient's effective doses