Diagnostic Reference Levels for Computed Tomography Examinations of Adult Patients

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PURPOSE

Diagnostic Reference Levels (DRLs) are important databases which help to optimize the radiation exposure to patients undergoing similar radiological examinations at different centers operating region-wide, countrywide or worldwide. This study aims to develop regional DRLs for the most common computed tomography (CT) examinations carried out around Izmir, Turkey, and to compare the results with national and international studies present in the literature.

MATERIAL and METHOD

Survey data were based on 5 most common adult CT examinations: Head, Neck, Thorax, Abdomen-Pelvis (AP) and Thorax-Abdomen-Pelvis (TAP) carried out in 4 different radiology departments located in Izmir (n=50 per protocol for each department; i.e. n=1000 in total). Collected data included the examination accession number, patient sex, age, effective tube current, tube voltage, Computed Tomography Dose Index-Volume (CTDIvol) and Dose Length Product (DLP) for each examination. Among all the exposure parameters, only CTDIvol and DLP values were statistically analyzed, since they account for the overall dosimetric information regarding the examination. CTDIvol information were based on body phantoms for all examinations except head examinations which were based on head phantoms for all departments. Third quartiles of CTDIvol and DLP datasets have been recognized as DRLs parallel to the literature. Statistical analysis has been performed by using IBM SPSS 23 Statistics software program.

RESULTS

51.3% of patients were male and 48.7% was female, with a mean age of 57 (between 18 and 93). DRLs for CTDIvol were recorded as 70 mGy, 16 mGy, 15 mGy, 23 mGy and 16 mGy for head, neck, thorax, abdomen-pelvis and thorax-abdomen-pelvis examinations respectively, while DLP results were 1385 mGy.cm, 605 mGy.cm, 567 mGy.cm, 998 mGy.cm and 1180 mGy.cm with respect to the same order.

CONCLUSION

This study was carried out on a wide range of patient age and size. Results agree well with the latest national and international data, except for the head examinations which were observed to slightly exceed the DRLs established by other countries¹,². Consequently, it is planned to bring this study to a furtherly comprehensive point based on data collected countrywide.

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References


Keywords

Diagnostic Radiology, DRLs, CTDIvol

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