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Local Diagnostic Reference Levels for Paediatric CT Brain

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Introduction: High radiation doses from Computed Tomography (CT) scans are the major concern for paediatric patients as they are more susceptible to radiation risk. Hence, diagnostic reference level (DRL) has been implemented to revise CT dose optimization. This study is aimed to determine local DRL of paediatric patients undergoing CT brain examination and compare the proposed DRL with the previously established reports. **Methods:** A total of 164 paediatric patients undergoing CT brain examination were retrospectively reviewed and categorized into five age groups: 0-2 years (Group 1), 3-5 years (Group 2), 6-12 years (Group 3), 13-16 years (Group 4), and 17-18 years (Group 5). CT dose index volume (CTDI_{vol}), dose length product (DLP) and effective dose (ED) were calculated for the third quartile to establish the local DRL. The DRLs were compared with the previously established DRL reports. **Results:** The results demonstrated DRL values ranged from 29.9 mGy - 59.4 mGy, 453.6 mGy.cm – 1051.3 mGy.cm, and 1.7 mSv – 3.9 mSv for CTDI_{vol}, DLP and ED. The doses were significantly varied among the age groups ($p < 0.001$). The present DRL was found to be higher than most of the other published DRLs in paediatric CT brains. **Conclusions:** The established DRL indicates dose variance in age groups among paediatric patients and higher than the established DRL reports in paediatric CT brain examination. The current CT brain protocol and practice should be reviewed to achieve dose optimization in paediatric CT.

Keywords: CT brain, diagnostic reference level, paediatric