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The impact of pediatric-specific dose modulation curves on radiation dose and image quality in head computed tomography (Article)

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Abstract

Background: The volume of CT examinations has increased with resultant increases in collective dose values over the last decade. Objective: To analyze the impact of the tube current and voltage modulation for dose values and image quality of pediatric head CT examinations. Materials and methods: Head CT examinations were performed on anthropomorphic phantoms and four pediatric age categories before and after the introduction of dedicated pediatric curves for tube voltage and current modulation. Local diagnostic reference levels were calculated. Visual grading characteristic image quality evaluation was performed by four pediatric neuroradiologists and image noise comparisons were performed. Results: Pediatric-specific modulation curves demonstrated a 49% decrease in mean radiation dose for phantom examinations. The local diagnostic reference levels (CTDIvol) for clinical examinations decreased by 52%, 41%, 46% and 40% for newborn, 5-, 10- and 15-year-old patients, respectively. Visual grading characteristic image quality was maintained for the majority of age categorizations (area under the curve = 0.5) and image noise measurements did not change (P = 0.693). Conclusion: Pediatric-specific dose modulation curves resulted in an overall mean dose reduction of 45% with no significant differences in subjective or objective image quality findings. © 2015, Springer-Verlag Berlin Heidelberg.

Author keywords

Child; Computed tomography; Head; Radiation dose reduction

Indexed keywords

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Medline is the source for the MeSH terms of this document.

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