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Individualized CT Imaging Protocol: Could Neck Circumference be a New Somatometric Parameter to Adjust Appropriate CT Protocol to Each Patient in Thorax?

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Objectives: To evaluate whether neck circumference (NC) is an appropriate somatometric parameter for determining thorax CT protocol specific to each individual to avoid unnecessary radiation.

Methods: Seventy-six patients undergoing non-contrast thorax CT were enrolled in this study. NC, body weight and height were measured and BMI was calculated before the imaging. The effective dose(ED) of the patient was calculated as millisievert(mSv).The visual image quality was assessed using on a 5-point scale.

Results: There were high correlations between BMI, NC, and weight. There were also high correlations between these three somatometric parameters and CT effective dose. The correlation between NC and ED ($r=0.839$) was higher than the correlation between BMI and ED ($r=0.635$).

Conclusion: It might be more accurate to determine the tube voltage, which is a parameter of CT protocol, according to NC value as NC was correlated in dose changes more accurately and with a higher proportion instead of BMI.

Keywords: Individual dose control, computed tomography, ALARA, tube voltage, neck circumference, body mass index