

Association of radiation doses and cancer risks from CT pulmonary angiography examinations in relation to body diameter

ABSTRACT

In this study, we aimed to estimate the probability of cancer risk induced by CT pulmonary angiography (CTPA) examinations concerning effective body diameter. One hundred patients who underwent CTPA examinations were recruited as subjects from a single institution in Kuala Lumpur. Subjects were categorized based on their effective diameter size, where 19-25, 25-28, and >28 cm categorized as Groups 1, 2, and 3, respectively. The mean value of the body diameter of the subjects was 26.82 ± 3.12 cm, with no significant differences found between male and female subjects. The risk of cancer in breast, lung, and liver organs was 0.009%, 0.007%, and 0.005% respectively. The volume-weighted CT dose index (CTDI_{vol}) was underestimated, whereas the size-specific dose estimates (SSDEs) provided a more accurate description of the radiation dose and the risk of cancer. CTPA examinations are considered safe but it is essential to implement a protocol optimized following the As Low as Reasonably Achievable (ALARA) principle.

Keyword: Radiation dose; Cancer risk; CTPA examinations; Body diameter; SSDE