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**Evaluation of optimal voltage for reduce radiation exposure of area detector computed tomography in children after Kawasaki disease**

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Background: It is well known that low exposure voltage of computed tomography (CT) could reduce radiation exposure, but also lowered resolution of the image.

Objective: The aim of this study was to evaluate radiation exposure and image quality of coronary arterial lesions after Kawasaki disease (KD) using area detector CT.

Methods: Consecutive 36 patients who are less than 15 years old after KD (mean age: 8.9+/-3.9 years old) were enrolled in this study, all of the patients underwent 320 area detector CT (Acquilion ONE, Toshiba) for assessment of coronary artery lesions; 14 patients with severe coronary arterial lesions, 16 patients with regression of coronary dilatation, 5 patients with myocarditis due to KD, and a patient with mild abnormality of myocardial perfusion image. We compared age, image quality, radiation dose length product and effective radiation dose (mSv). These patients were divided in 2 groups with a voltage of 120 kV (group-H) and 80 or 100 kV (group-L). Image quality was ranked into these 3 categories; 3 points: all coronary arteries were well visualized, 2 points: images were adequate even if the distal arteries were not visualized, and 1 point: the image were inadequate.

Results: Inadequate image is completed in an only patient. The mean age of these groups were 11.0+/-2.8 years old in group-H and 7.0+/-3.8 years old in group-L ( $p<0.0001$ ). Average image quality was 2.5+/-0.6 points, 2.6+/-0.5 points in group-H and 2.4+/-0.6 points in group-L ( $p=0.07$ ). Average radiation dose length product was 206.7+/-182.5 mGycm, 338.0+/-178.9 mGycm in group-H and 89.3+/-73.9 mGycm in group-L ( $p<0.0001$ ). Average effective radiation dose was 3.40+/-3.14 mSv, 5.75+/-3.04 mSv in group-H and 1.30+/-1.04 mSv in group-L ( $p<0.0001$ ).

Conclusion: Low tube voltage including 80 or 100 kV could achieve low radiation exposure with average effective radiation dose of 1.3 mSv for children with mean age of 7.0 years old without lowering the image quality of area detector CT after KD.