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Radiation dose and circulatory diseases associated with CT Cardiac Angiography (CCTA)

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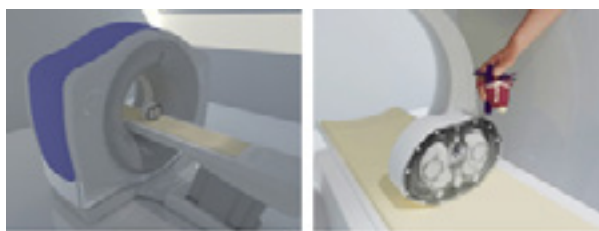
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Statement of the Problem: CT Cardiac angiography is increasingly utilized for the noninvasive assessment of coronary artery disease (CAD) due its ability to exclude or diagnose CAD with high accuracy and fast acquisition time. CT delivers high radiation doses to organs that are in the direct path of radiation beam. Thus, there is a potential risk of inducing cellular damage or radiation-induced cancer due to exponentially increased use of this technique in medicine. Exposure of the heart to high doses of ionizing radiation is associated with cardiac lesions, but there are no conclusive studies regarding ionization radiation at low doses and the risks involved for CT Cardiac angiography. The purpose of this study is to review the literature describing the effect of radiation dose on the circulatory system, with emphasis on the heart during the CCTA procedures.

Methodology: The research was carried out in a Private Hospital, which has one GE Discovery dual-energy CT scanner. A sample of patients (n= 100) were selected randomly and in each patient, technical parameters and radiation dose were recorded by database. This study was divided in two phases: (1) To evaluate the CT doses using values reported on the equipment console (2) To determine the organ dose using 3D heart with Anthropomorphic Torso Phantom and dosimeter thermoluminescence.

Findings: The results demonstrated the median effective dose was similar with the recent studies, approximately 4.6mSv. The second stage (absorbed dose in the heart) is still in progress due to the discrepancy of the values found in this study with the values of the literature.

Conclusion & Significance: The preliminary results demonstrated the importance to record the radiation exposure during the CCTA. Training and improvement of the team involved in the exam to be familiar with the radiation dose received by the patients during clinical practice.



Biography

Larissa Oliveira is an excellent research scientist who is doing important work in the Medical Physics field - Diagnostic Radiology, Radiation Protection, Dosimetry, Quality Control and Optimization in Brazil. Her researches provided us information regarding about the importance of justification and optimization and the necessity of developing Optimization Programs, as well as the potential of dose reduction for patients without compromise the diagnostic information and the importance of regular education and training. Recently, she studies the impact of the ionization radiation heart injuries during the CT Cardiac angiography. The heart is considered a late response organ. In high doses of radiation, the cardiac effects are already known, though there is no evidence that the cardiovascular system may also be injured by ionizing radiation at low doses. This approach demonstrated the importance to keep the radiation exposure as low as reasonably achievable strategy to reduce the potential risk

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