Abstract Title: Estimating risk of cancer posed by radiation from 128-multidetector computed tomography scanner during Cardiac CT angiography

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Abstract :

Background: The risk of cancer associated with ionizing radiation exposing during Cardiac Computed Tomography Angiography (CCTA), in order to diagnosis cardiovascular diseases, has been recently brought up a serious concern.
Aim: The aim of this study was estimating radiation organ dose and the life attributable risk (LAR) of cancer incidence and mortality in three different retrospective electrocardiography (ECG) techniques, and evaluating the impact of age, gender and scan protocol on cancer risk on patients undergoing CCTA.
Method: We used three techniques, namely: caredose4D (group1), standard protocol (group2), and chest circumference adapting tube current and tube voltage (group3). For measuring organ dose, thermoluminesense dosimeters were placed on three radiosensitive organ; thyroid, breast and lens of eyes. Data from dosimeters were used to calculate organ dose ,and then the LAR of cancer incidence and mortality were estimated based on Biological Effect of Ionizing Radiation (BEIR) VII report.
Result: The results indicate that Lens dose was not noticeable for both groups based on gender. Thyroid dose was 0.098 mSv, 0.119 mSv, and 0.122 mSv for men, and 0.114 mSv, 0.163 mSv, 0.173 mSv for women for group1, group2 and group3, respectively. There was a remarkable difference for breast dose between women groups (p-value=0.04), while the difference was not noticeable for men groups. LAR of thyroid cancer incidence for all age groups were lower in group1 in comparison with group2 and group3.The result for breast cancer mortality showed that chest circumference protocol exposed more radiation dose to patients, and as a consequence the rate of mortality increased up to two fold in comparison with standard protocol and CareDose4D protocol.
Conclusion: The study found that the thyroid dose and female breast dose, and LAR of cancer incidence had the significant reduction with CareDose4D technique in comparison with standard protocol and chest circumference adaptation protocol.

Keywords— *Cancer, Computed tomography angiography, Radiation Dose, radiosensitive organ*

Professional Biography

Nazli Shojaei Barjouei has completed his MSc from Shahid Beheshti University of Medical Sciences. She currently works as a medical radiation researcher and has collaboration in several projects with clinical departments of the university.



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