Medical Xpress

Acute heart attack patients receiving high ionizing radiation dose

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Acute heart attack patients received an average total dose of ionizing radiation equal to 725 chest X-rays from medical tests during their hospital stay, according to research presented at the American Heart Association's Scientific Sessions 2009.

In the first large study to examine total radiation dosage in heart attack patients, researchers found those admitted to academic hospitals had a cumulative effective radiation dose of 14.5 millisieverts (mSv) — about one-third the annual maximum accumulation permitted for workers in nuclear power plants and other ionizing radiation environments.

"It's potentially a new way to consider radiation exposure and safety," said Prashant Kaul, M.D., lead author of the study and a fellow in cardiovascular medicine at Duke University Medical Center in Durham, N.C. "We think physicians should not only have a greater awareness of dose accumulation from the tests they are ordering, but also understand the testing patterns they use for common diagnoses."

Total short term exposure likely counts, he said. A person's lifetime exposure to ionizing radiation can potentially increase the risk of cancer. However, risk estimates vary for developing malignancies at specific exposure levels.

Physicians perform several billion imaging studies annually worldwide, about one-third of them in cardiovascular patients. The collective dose received annually from ionizing radiation medical tests increased an

estimated 700 percent between 1980 and 2006, according to the American Heart Association.

Kaul urged increased efforts to better determine the appropriate use of various radiation-based tests when assessing and treating heart attack patients.

"We should not withhold necessary, appropriate tests that involve ionizing radiation — they provide very important information," Kaul said. "What we should do is evaluate and understand the clinical indications for tests that involve ionizing radiation. We need to be sure they are being done appropriately."

Researchers analyzed data from 64,074 patients — 23,394 women and 40,680 men — treated for acute heart attack between 2006 and the second quarter of 2009 at 49 academic hospitals throughout the United States that participate in the University Health System Consortium and subscribe to their resource manager database.

Among the study's findings:

- Patients received 276,651 tests that used ionizing radiation, an average of seven per patient.
- Patients averaged a total accumulation of 14.52 mSv during their hospital stay.
- Among the nine types of tests analyzed, 83 percent of all patients received chest X-rays; 77 percent had catheter procedures; 15 percent underwent body computed tomography (CT) scans; and 12 percent had a head CT.

- Between 1 percent and 6 percent of patients had three other nuclear imaging tests and chest CT.

Physicians tend to focus on the radiation dose of each procedure rather than the cumulative dose a patient will receive, he said. "This makes the risk seem smaller to patients than it actually is. The risk at an individual level is small with one test, but with multiple tests the risk likely increases. Additionally, a small individual risk applied to a growing and aging population could potentially represent a future public health problem, especially if the trend continues to be increased use of cardiac imaging tests involving ionizing radiation."

The study has several limitations. For one, the researchers used estimates of typical effective radiation doses from several sources, including the American Heart Association Committee on Cardiac Imaging. Thus, their reported cumulative and radiation dose per patient is an estimate rather than actual measurement.

Moreover, the researchers selected nine tests used in assessing heart attacks for their study, but physicians may also use others.

Source: American Heart Association (news : web)

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