Use of advanced radiology for injury-related emergency department visits increases significantly

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From 1998 to 2007, the use of CT or MRI scans in emergency departments for injury-related conditions increased about 3-fold without a similar increase in the prevalence of the diagnosis of certain life-threatening trauma-related conditions, according to a study in the October 6 issue of *JAMA*.

Injury-related conditions are among the most common reasons for visits to emergency departments in the United States. "The widespread availability of advanced radiology (computed tomography [CT] and magnetic resonance imaging [MRI]) and the associated diagnostic superiority in identifying significant injuries have made these tools important in the evaluation of patients presenting to emergency departments," the authors write. They add that increased use of these tools is associated with increased health care expenditures, increased length of stay in the emergency department and increased exposure to ionizing radiation. Knowing whether use of these tools has increased is important because approximately 70 percent of injury-related visits are by persons who are younger than 45 years, who are at the greatest risk for potential long-term oncological effects of ionizing radiation exposure , according to background information in the article.

Frederick Kofi Korley, M.D., of Johns Hopkins University, Baltimore, and colleagues examined the national trends in the use of advanced radiology during emergency department visits for injury-related

conditions over a 10-year period (1998-2007), using data from the National Hospital Ambulatory Medical Care Survey. Sampled visits were weighted to produce estimates for the United States. Between 1998 and 2007, a total of 324,569 emergency department visits were sampled. Of these, 65,376 presented with injury-related conditions (20 percent), representing an estimated average of 22.4 million visits made to emergency departments in the United States each year for injury-related conditions. Visits were sampled from an average of 370 hospitals per year.

Of the 5,237 visits for injury-related conditions sampled in 1998, 257 patients received CT or MRI (6 percent); in 2007, of the 6,567 visits sampled, 981 patients received CT or MRI (15 percent). Analysis indicated that patients who presented to the emergency department for injury-related conditions in 2007 were about 3 times more likely to receive a CT or MRI compared with similar emergency department visits in 1998. Increase in CT use accounted for the majority of the increased CT or MRI use.

"Some factors that may have contributed to this significant increase in CT use are the superiority of CT scans over x-rays for diagnosing conditions such as cervical spine fractures, the routine use of whole-body scanning for patients treated in some trauma centers, the increased availability of CT scanners, the proximity of CT scanners to the patient care areas of most emergency departments, the speed of new-generation CT scanners leading to a decrease in the need to sedate pediatric patients, and concern about malpractice lawsuits for a missed diagnosis," the authors write.

A life-threatening condition (e.g., cervical spine fracture, skull fracture, intracranial bleeding, liver and spleen laceration) was diagnosed in 59 of 5,237 sampled visits (1.7 percent) in 1998 compared with 142 of 6,567 visits (2.0 percent) in 2007. There was no significant change in the

proportion of injury-related visits that resulted in admission to the hospital (5.9 percent in 1998 and 5.5 percent in 2007) or admission to the intensive care unit (0.62 percent in 1998 and 0.80 percent in 2007).

The researchers also found that patients ages 60 years or older were more likely to receive CT or MRI than those between the ages of 18 and 45 years; and patients ages 18 years or younger were less likely to receive a CT or MRI than those between the ages of 18 and 45 years.

The average difference in length of stay for visits for injury-related conditions during which CT or MRI was obtained was 126 minutes longer than for similar visits in which CT or MRI was not obtained.

"Further work is needed to understand the patient, hospital, and physician factors responsible for this increase [in CT and MRI use] and to optimize the risk-benefit balance of advanced radiology use. The role of evidence-adoption strategies such as computerized decision support and audit and feedback in promoting adherence to decision rules for imaging needs to be further understood," the authors conclude.

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