

Iodinated contrast media in CT is not associated with increased risk of acute kidney injury

This article summarizes a recently-published study designed to determine how often acute kidney injury (AKI) occurs after contrast-enhanced and non-contrast enhanced CT in the emergency setting. The results of the propensity-matched, case-controlled study, showed that there was no difference in the frequency of AKI between enhanced and non-enhanced patients undergoing CT, suggesting that the current fear of triggering AKI by intravenous contrast media is not supported by objective data.

The conclusion of a recently published study — the largest controlled study of acute kidney injury following contrast media administration in the emergency department is that intravenous iodinated contrast media used in computed tomography (CT) does not appear to be associated with chronic kidney disease, dialysis, kidney transplant or acute kidney injury, despite long-held fears to the contrary [1]. The study involved case analyses of a total of 17934 unique patient visits. The outcome measure was the frequently-used criterion of contrast-induced nephropathy (CIN), namely an absolute or relative increase in serum creatinine level.

As Dr. Jeremiah Hinson, of Johns Hopkins University School of Medicine in Baltimore, MD, USA, lead author of the study, pointed out [1], iodinated contrast media administration has been cited as the third most common cause of iatrogenic acute kidney disease and has been linked to an increased risk of major adverse events including initiation of dialysis, renal failure, stroke, myocardial infarction. Other studies have linked contrast-induced nephropathy to a 2-fold increased risk of major adverse events within one year.

However, although such reports are worrisome, the causal relationship between the administration of intravenous iodinated contrast media and the development of acute kidney injury has recently been

challenged [2]. Current understanding of contrast-induced nephropathy (CIN) is complicated by studies that pre-date the widespread usage of low- and iso-osmolar contrast media. In addition, most of these studies did not use control populations who did not receive contrast media.

“Over 80 million doses of IV contrast media are administered every year, and in the emergency department its use can be essential to accurately diagnose certain acute critical conditions,” said Dr Hinson “But physicians have had concerns that the administration of contrast media causes serious kidney problems later on, with some studies showing contrast-induced nephropathy occurring in as many as 14 percent of patients receiving it. However, studies used to establish this risk were performed prior to the development of modern contrast reagents or without adequate controls. Using a controlled design in current context, we could not find an association between intravenous contrast media use and acute kidney injury.”

The Johns Hopkins researchers studied five years of records for patients receiving CT with or without contrast-enhancement in the emergency department. Of all CT scans, 57.2 percent were contrast-enhanced. The probability of developing acute kidney injury was 6.8 percent for patients undergoing contrast-enhanced CT, 8.9 percent for patients



A new study in *Annals of Emergency Medicine* finds no association between intravenous contrast media used in computed tomography (CT) and kidney damage. Roughly 80 million doses of IV are given every year. Image courtesy of American College of Emergency Physicians

receiving unenhanced CT and 8.1 percent for patients not receiving CT at all.

“While a well-controlled randomized prospective study is required to fully determine the contribution of intravenous contrast media to the development of acute kidney injury, our results clearly demonstrate that in emergency departments such as ours where practice patterns have evolved to protect patients’ kidneys, contrast media is not associated with increased risk of kidney injury,” said Dr. Hinson. “Our data also suggest that in cases where contrast-enhanced CT is indicated to avoid delayed or missed diagnosis of critical disease, the potential morbidity and mortality resulting from a failure to diagnose potentially life-threatening conditions likely outweigh any potential risk of kidney injury”.

References

1. Hinson JS et al. Risk of Acute Kidney Injury After Intravenous Contrast Media Administration. *Ann Emerg Med.* 2017. pii: S0196-0644(16)31388-9).
2. Mcdonald JS et al. Has the incidence and severity of contrast-induced nephropathy been overestimated. *Diagnostic Imaging Europe* 2013; 201(7): 14.