

How common is contrast induced acute kidney injury (CI-AKI) in patients undergoing coronary angiography and percutaneous coronary intervention (PCI)?

Dr Tracey Salter^{1,2}, Dr Amy Forrester¹

¹Frimley Health NHS Foundation Trust, Frimley, United Kingdom, ²Epsom and St Helier University Hospitals NHS Trust, Carshalton, United Kingdom

Introduction

CI-AKI is said to be one of the commonest causes of AKI in clinical practise. It is thought to be irreversible in many cases. This causes clinician concern, resulting in investigations involving contrast being withheld in patients with multiple risk factors for CI-AKI, potentially increasing morbidity and mortality.

Our aims were to determine how common CI-AKI is in patients undergoing coronary angiography and/or PCI as an emergency or elective admission in a large acute cardiac centre, and to analyse whether age, sex, baseline renal function or diabetes are risk factors for CI-AKI.

Methods

We retrospectively collected data from 678 consecutive patients undergoing elective or emergency coronary angiography and/or PCI between April and June 2017. The data collected included age, sex, diabetic status, baseline creatinine and eGFR, creatinine at 48-72 hours post procedure, and stable outpatient creatinine ~1 year post procedure.

Results

Of the 678 coronary procedures performed, 38% were emergency admissions. There were 430 angiograms, 200 angiograms with PCI, and 48 PCI. 68% of these cardiac patients were male. 26% had pre-existing chronic kidney disease (CKD; eGFR <60), 30% were elderly (age>75 years), 25% had diabetes, and 3% were elderly and diabetic with known CKD. Of those with CKD, 90.4% had CKD 3, 8.2% had CKD 4, none had CKD 5, and 1.4% were haemodialysis dependent.

At 48-72 hours, just 5 patients had an AKI. 2 patients had AKI 1, 1 had AKI 2, and 2 had AKI 3. All 5 patients had had an emergency angiogram, with one having had additional PCI. 2 of these patients were >75 years, 2 had preceding CKD and 2 were diabetic. 1 patient who developed an AKI had all 3 risk factors.

The 5 patients who developed AKI 48-72 hours post contrast had the following outcomes: 2 had complete renal recovery, 2 died and 1 was left with CKD. The patient who developed CKD was diabetic, and had a prolonged critical care admission with overwhelming infection.

Discussion

The risk of developing a CI-AKI 48-72 hours post cardiac procedure in our cohort was low (4%). All 5 cases were >75 years old or diabetic or had CKD, with one case having all 3 risk factors. We saw no AKI post elective procedures. The majority of AKI was seen in the sickest patients, with 3 out of 5 cases having required ICU admission.

Reassuringly, developing CKD in the year post coronary procedure with contrast was extremely rare in our cohort – just 1 out of 678 patients. This is despite many of the patients having risk factors for developing CKD, and many being commenced on potentially nephrotoxic medications post myocardial infarction or for heart failure including ACE inhibitors, diuretics, and/or aldosterone antagonists.

This study shows that the risk of short term CI-AKI post coronary angiogram or PCI is low (<5%), even when the patient has what have been previously thought to be risk factors for developing CI-AKI. In our cohort the risk of developing longstanding renal impairment post contrast procedure was extremely low (<0.2%).