

Introduction and Objectives

Patients with renal transplants are at higher than normal risk of coronary artery disease¹. A perceived risk of contrast nephropathy may result in reluctance to perform coronary angiography². Our aim was to determine if renal transplant function was adversely affected within 30 days of coronary angiography.

Methods

Retrospective study including prevalent renal transplant patients in NHS Greater Glasgow and Clyde who underwent coronary angiography from 04/07/10 – 05/02/15. Data were extracted from the electronic patient record for baseline demographics including sex, age at angiography, time since renal transplant, indication and purpose of coronary angiography. Serum creatinine (SCr) was recorded: (i) 0-24 hrs pre-angiography, (ii) within 7 days post angiography, (iii) 7-30 days post angiography. Baseline SCr was calculated as median in the 6 months before coronary angiography, excluding SCr values during periods of acute kidney injury. Rise in SCr >26 µmol/l from baseline was considered significant (AKIN classification).

FIGURE 1: INDICATION FOR ANGIOGRAPHY

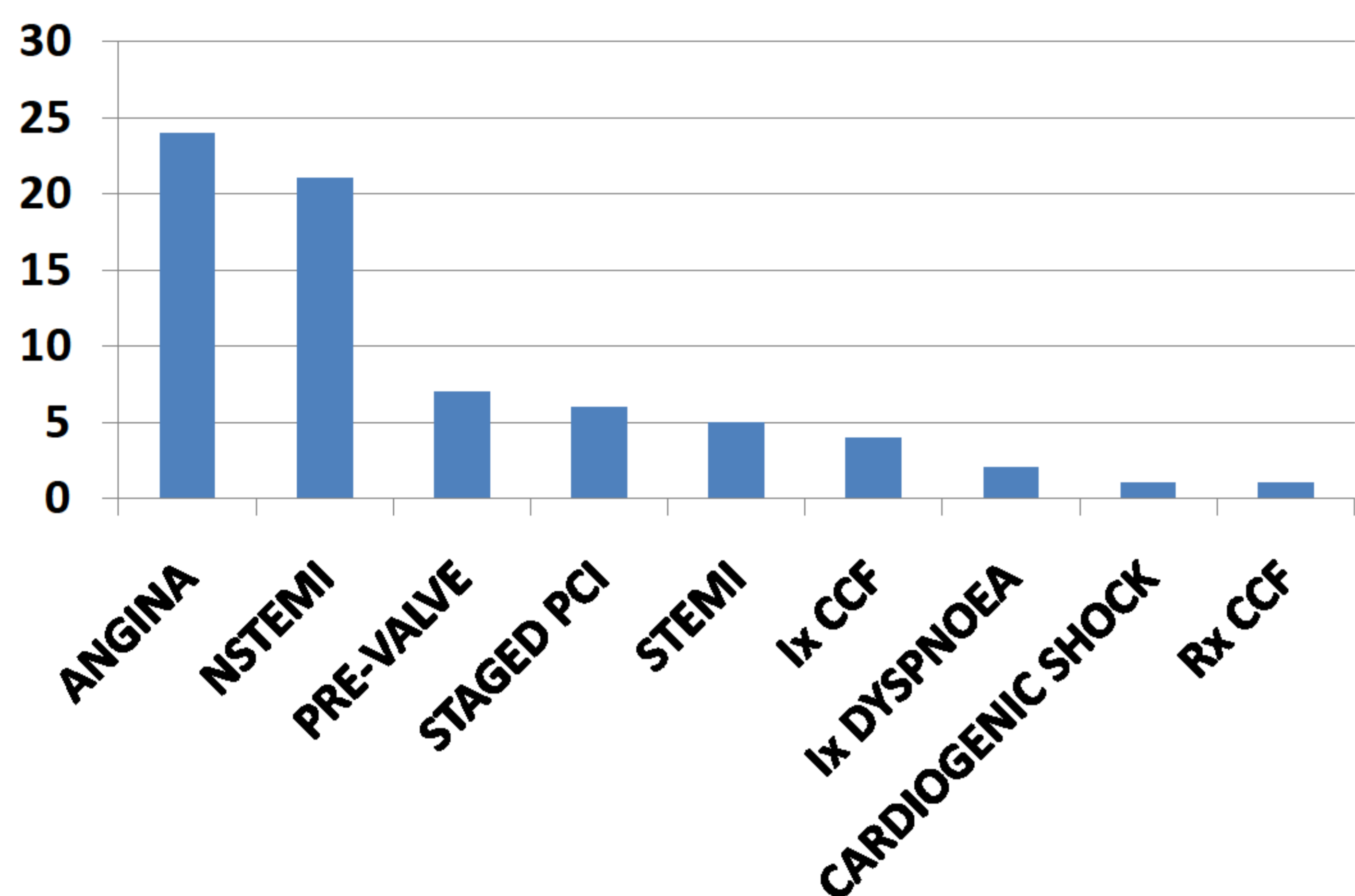


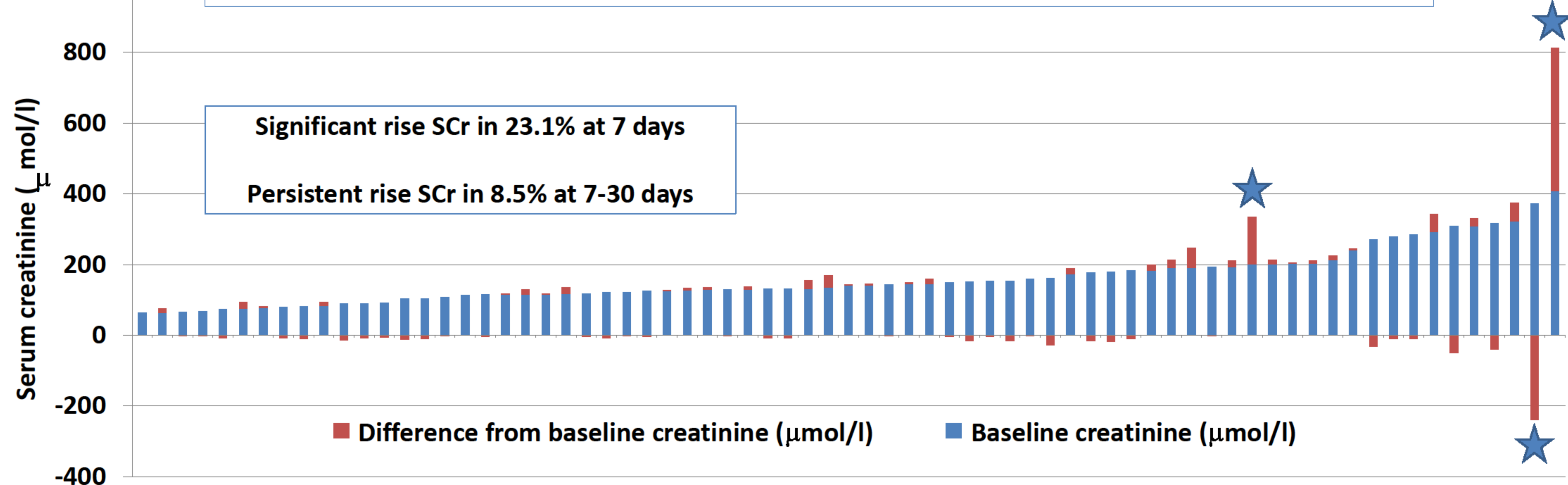
TABLE 1: BASELINE DATA

72 angiograms; 52 patients	
Mean age (years)	56.0 (SD 9.0)
% Male	65.4
% Diabetes	23.1
% Inpatient	29.6
Median time since transplant (years)	5.0 (IQR 2.0 - 14.0)
Median baseline SCr (µmol/l)	136 (IQR 114-214)
Median SCr at angiography (µmol/l)	141 (IQR 115-194)

Results

There were 72 coronary angiograms conducted in 52 patients. Baseline demographics are details in Table 1 above. Indication for angiography is illustrated in Figure 1 above. Within 7 days of angiography, there was a significant rise in SCr from baseline in 33.0% of cases (n=39; median rise 40 µmol/l, range 28-183 µmol/l). Between 7-30 days, there was a significant rise in SCr in 8.5% instances (n=71; median rise 54 µmol/l, range 34-404) (Figure 2). Of these 8.5%, half represented those with a persistent rise from day 0-7, and half comprised patients who had no SCr recorded at day 0-7. Within 30 days, SCr had returned to within 30% of baseline renal function in 95.8% instances. Of the remaining 4.2%, all 3 patients died following angiography as a result of cardiac disease rather than renal failure.

FIGURE 2: DIFFERENCE IN SCr AFTER ANGIOGRAPHY FROM BASELINE AT 7-30 DAYS



Additional information about 3 outliers (starred) is as follows (from left to right): 1 – Angiography conducted as part of palliative management for severe heart disease. The patient died shortly after angiography and no intervention taken for acute kidney injury. 2 – Haemodialysis patient who had NSTEMI post transplant. SCr significantly improved after angiography as renal transplant began to function. 3 – Angiography performed for severe ischaemic heart disease. This patient had a cardiac arrest within 1 month of angiography and died. No intervention taken for acute kidney injury. One additional patient, not represented on graph above, rapidly deteriorated and died after angiography of severe heart failure.

Conclusion

Coronary angiography was associated with a significant rise in creatinine in a minority of cases. In the absence of critical illness, there was no requirement for extended admission or dialysis for contrast-associated acute kidney injury. Renal transplantation should not be considered a contraindication for coronary angiography.

Topic: Renal Transplantation. Clinical.

References

1. Felix R, Saparia T, Hirose R, Almers L, Chau Q, Jonelis T, Zheng S, Zaroff J. Cardiac events after kidney transplantation according to pretransplant coronary revascularization status. *Transplant Proc* (2016); 48(1):65-73. 2. Chalikias G, Drosos I, Tziakas DN. Contrast-induced acute kidney injury: an update. *Cardiovasc Drugs Ther* (2016); 30(2): 215-228.