ABSTRACT

ACCURACY OF PRE-PROCEDURAL RENAL RESISTIVE INDEX IN PREDICTING CONTRAST INDUCED ACUTE KIDNEY INJURY IN PATIENTS WITH PRESERVED RENAL FUNCTION SUBMITTED TO ELECTIVE CORONARY ANGIOGRAPHY

CONTEXT:

The frequency of contrast induced acute kidney injury varies from 3 to 13% of patients posted for coronary angiographies, which has increased mortality and morbidity. Intra renal vascular resistance may act as an additive factor for tubular injury caused by contrast media in renal medulla- due to action of contrast media causing imbalance of intra renal vasoconstriction and vasodilator agents.Renal resistive index (RRI) acts as a predictor of intra renal arterial stiffness, indirectly indicating renal vascular resistance. So renal resistive index (RRI) is indicative for susceptibility to acute kidney injury and contrast mediated renal injury.

KEYWORDS: contrast induced nephropathy, coronary angiography, acute tubular necrosis, renal resistive index

AIM OF STUDY:

To evaluate significance of pre-operative ultrasonographic parameter of intra renal blood flow (RRI), for prediction of contrast induced acute kidney injury in patients with coronary artery disease and preserved renal function, referred for elective coronary angiography. To suggest the possible application of renal resistive index (RRI) during initial check up of patient along with other routine investigation for risk stratification of patients, prone for contrast induced acute kidney injury.

STUDY DESIGN:

Prospective analytical study

MATERIALS AND METHODS:

The study will be conducted in 100 patients admitted in government Rajaji hospital and Madurai medical college, for purpose of elective coronary angiography, during the study period from March 2018 to August 2018. Baseline renal resistive index is higher in patients who developed contrast induced acute kidney injury following elective coronary angiography, suggesting the superior predictive value of renal

resistive index for predicting acute kidney injury due to contrast administration, even when the pre procedural RFT was normal.

INCLUSION CRITERIA:

- Stable angina with positive treadmill test
- ST elevation acute coronary syndrome after thrombolysis
- Non ST elevation acute coronary syndrome
- Unstable angina

EXCLUSION CRITERIA:

- Significant hemodynamic instability (cardiogenic shock; killip class>2; catecholamine use)
- Respiratory failure (acute or chronic; blood oxygen saturation<90%)
- Severe heart failure with left ventricular ejection fraction (LVEF<35%)
- chronic kidney disease (with eGFR < 50 mL/min/1.73 m2 or proteinuria >500 mg/L)
- evidence of renal artery stenosis or hydronephrosis
- moderate to severe aortic valve stenosis

- severe valvular heart disease of any kind
- severe obesity (body mass index, BMI > 40 kg/m2)
- liver dysfunction (any hepatic aminotransferase >3× upper reference limit)
- age <18 or >80 years old

STATISTICAL ANALYSIS:

one way ANOVA, pearson correlation and chi square test.

RESULTS:

So with RRI we can select individuals requiring more intense peri procedural hydration regimen, forced diuresis, cessation of nephrotoxic drug, statin loading dose prior to procedure, limiting the dose and duration of contrast administration and prolonged post procedure renal function monitoring. The pre procedural renal resistive index with renal function test done at 48 hours is seen significant as compared with all studies from all over world. The mean serum creatine at 48 hours after contrast study is found to be 1.533 mg/dl ($p<0.001$).

CONCLUSION:

Baseline GFR and serum creatinine cannot predict contrast induced acute kidney injury onset in patients with preserved renal function. But higher pre procedural renal resistive index(RRI) can be used as a novel risk factor for the above population. It has better result in elderly, advanced peripheral and coronary atherosclerosis and type 2 diabetic patients. So with RRI we can select individuals requiring more intense peri procedural hydration regimen, forced diuresis, cessation of nephrotoxic drug, statin loading dose prior to procedure, limiting the dose and duration of contrast administration and prolonged post procedure renal function monitoring.