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Angiographic Correlation between Coronary and Renal Artery Lesions in Patients Undergoing Simultaneous Coronary and Renal Angiography

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Abstract

Our aim was to see the association between lesions in coronary arteries and atherosclerotic renal artery stenosis (RAS) in suspected IHD patient. Data collected prospectively from 200 consecutive patients who underwent simultaneous coronary and renal angiography in suspected IHD patients. In 168 individuals of the study population, significant CAD was present (84%). Prevalence of RAS was 11% (22 patients). Significant (³50% luminal diameter stenosis) RAS was present in 12 patients (6%). Older age, higher systemic blood pressure at the time of catheterization, and 3-vessel coronary artery disease (CAD) were more associated with significant RAS. Simultaneous renal angiography is justified in patients with significant CAD particularly in older patients with hypertension.

Keywords: coronary artery disease, renal artery stenosis, coronary angiography

Introduction:

Certain vascular beds are affected preferentially by atherosclerosis. Atherosclerotic renal artery stenosis (RAS) is an important and frequently unrecognized contributor to refractory hypertension (HTN), ischemic nephropathy, and cardiac destabilization syndromes (unstable angina, flash pulmonary edema, and decompensated heart failure).[1–5] Atherosclerotic RAS is a progressive disease leading to renal atrophy over time and chronic kidney disease despite control of HTN.[6–12] Presence and severity of incidental RAS is an independent predictor of mortality in atherosclerotic patients regardless of the mode of treatment of underlying coronary artery disease.[13–15] The prevalence of RAS has been reported to be in the range of 20–30 percent in high risk populations including patients with known atherosclerotic vascular disease elsewhere.[16–18] In these patients invasive screening for RAS is highly cost-effective especially when done at the time of another invasive diagnostic procedure like coronary angiogram, and may affect treatment strategies. Atherosclerosis is a diffuse process but affects certain regions of the vascular bed preferentially. The association between extent and severity of CAD and RAS has been well established in most previous studies,[12–14] . In conclusion, we postulate that these findings might help decide in which group of patients screening renal angiography could be justified following coronary angiography.

Methods:

200 suspected IHD patients who underwent simultaneous coronary and renal angiography in the department of cardiology of Bangabandhu Sheikh Mujib Medical University (BSMMU) were selected randomly for the study during the period from june2008 to March 2011. Suspected IHD patients were selected for coronary and renal angiography without any definite indication for the latter. Suspected IHD patients were selected randomly on the basis of clinical, ECG, Echocardiography, ETT findings or with previous history of acute coronary syndrome. Demographic variables, laboratory data, and history of atherosclerotic risk factors obtained from the patients medical record. After performing coronary angiogram, all of these patients underwent selective renal angiography using a right judkins catheter. No procedural related complications were reported. Significant RAS defined if luminal-narrowing ≥50% percent was present. Coronary artery disease considered significant if ≥70% stenosis in major coronary arteries i,e- LAD, LCx and/or RCA. LM ≥50% was also considered significant. All angiograms interpreted by two expert interventional cardiologist.

Results:

In our cohort of patients, 116 (58%) were male and 84(42%) were female with mean age of 57.3 ± 9.7 years. As for major atherosclerotic risk factors, 146 patients (73%) had HTN, 90 patients (45%) were diabetics, 134 individuals (67%) had dyslipidaemia, 60 (30%) of them were smoker and 18 subjects (9%) had a positive FH (Table 1).

Table-1

Age, sex and riskfactors of the study population

Variables	Total(n=200)
Mean Age in years	54.3 ± 9.7
Male	116 (58%)
Female	84 (42%)
Hypertension	146 (73%)
Diabetes	90 (45%)
Dyslipidaemia	134 (67%)
Smoking	60 (30%)
Family history	18 (9%)

Among 200 patients, prevalence of RAS with any degree of stenosis was 22 (11%). Significant RAS was present in 12 patients (6%). It was unilateral in 9 patients (4.5%) and bilateral in 3(1.5%). In 168 individuals, significant CAD was present (84%). In the remaining 32 patients (16%) with either normal coronaries or insignificant CAD, two subjects (1%) had significant RAS. Significant RAS was more common in patients with three vessel CAD compared to those with single or two vessel CAD.(See Table 2).

Table-II

Catheterization characteristics

Variables	Total (n=200)	Significant RAS	Normal/ Insgnificant RAS
Significant CAD	168	12	188
Extent of CAD			
Normal/Minimal	32	2	68
CAD			
SVD	42	2	24
DVD	58	3	34
TVD	68	5	62

** P Value: <0.001

Patients with significant RAS were older compared to those without significant disease. Neither sex nor other atherosclerotic risk factors showed any association with significant RAS.

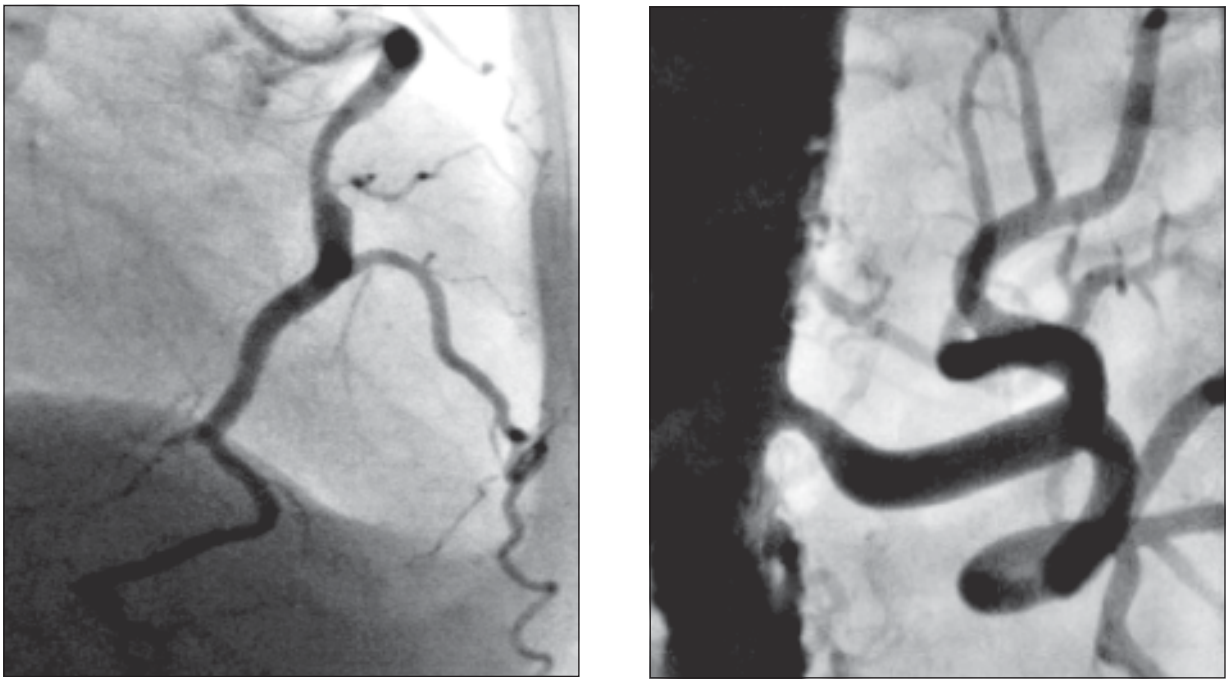

Fig.-1 : *Showing correlation of significant CAD with RAS*

Discussion:

Prevalence of RAS with different severities in this cohort of patients undergoing coronary angiography is within the range of most other studies. Our study showed no difference in patients with significant RAS compared to those with respect to major atherosclerotic risk factors except for age. This may reflect that traditional risk factors have a limited potential for predicting RAS. Dzieliñska et al[5] and Wang et al[12] were reported similar results, but considerable variability seen in many other studies. In our study, age more than 55 years was an independent predictor of RAS. In a number of studies, this issue addressed with different thresholds, in which it was more than 60 years at a minimum.[6,9] Bearing in mind that not all patients with even severe RAS have uncontrolled HTN, renal failure or other clinical clues[1,12] and the fact that well proven anti-atherothrombotic medications which block rennin- angiotensin system may act as a two edged sword in the presence of significant but clinically unsuspected bilateral RAS[1,3] underscores the need to

step beyond traditional screening for RAS. Hemodynamically significant RAS may have several deleterious systemic effects through activating this system, which may accelerate atherogenesis and contribute to cardiovascular events.[13,14] There was a good relationship between intra- arterial systolic and pulse pressures and RAS, which is in agreement with study of Weber-Mzell et al8 and Rihal et al.[18] In our study, systolic BP above 160-mmHg and pulse pressure in excess of 60 mmHg found to be independent predictors of significant RAS. We found significant relationships between atherosclerotic involvement of LAD, LCX, and RCA and RAS. As for number of coronaries involved, patients with three vessels CAD showed strong relationship with RAS and those with normal coronaries or insignificant CAD had a potent negative association with RAS. There was no relationship between anatomical distribution of coronary artery lesions (proximal, mid or distal portions) and RAS in a study by Danesh et al,[1] but two and 3-vessel coronary disease reported as an independent predictor of significant RAS. Although the therapeutic implications of incidentally detected RAS has been remained controversial until now it may be valuable to be aware of this condition given the progressive nature of the disease,the precautions in prescribing angiotensin antagonists and possibly the need to revascularization in appropriately selected cases. Given the considerable drawbacks of noninvasive imaging techniques[1,2,13] and safety of renal angiography[13,16,17] recognizing potential candidates for screening of RAS based on readily available variables at the time of cardiac catheterization is important from a practical point of view. Patients with incidental significant RAS may deserve aggressive interventional treatment.

Conclusion:

Simultaneous renal angiography at the time of coronary angiography might be justified particularly in older patients and having significant CAD.

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