



HEART

Vol: 3 No: 2; 2007



SQUARE
PHARMACEUTICALS LTD.
BANGLADESH

Controversies in Renal Artery Stenosis: A Review by the American Society of Nephrology Advisory Group on Hypertension

RENAL ARTERIAL DISEASE

Prevalence and Natural History

Clinical Clues to the Diagnosis of RAS

Diagnostic Methods

Summary Of Noninvasive Renal Artery Diagnostic Imaging Strategies.

Treatment of Renovascular Disease: Renal Artery Stenosis

Cardiology News



Controversies in Renal Artery Stenosis: A Review by the American Society of Nephrology Advisory Group on Hypertension

Introduction

There are gaps in understanding 'incidental' renal artery stenosis (RAS) found during cardiac catheterization. RAS lesions often must be evaluated based on limited dimensional images, often in the presence of severe vascular disease, and commonly in the face of diminished renal function. Patients with atherosclerotic RAS face increased risk from cardiovascular events and progressive renovascular occlusion. The role and timing of renal revascularization is controversial. Recent studies indicate that the benefits of renal revascularization are nearly balanced by the potential adverse effects, leading to what has been defined as 'clinical equipoise'.

What Do We Know about Outcomes and Renovascular Disease?

Despite the association of reduced renal function and cardiovascular disease, the relationship between vascular compromise, renal dysfunction, glomerular filtration rate (GFR) decline, and the extent of renal dysfunction that is due to ischemia, has not been well studied. Invasive cardiologists commonly examine renal arteries during cardiac catheterization in a procedure labeled 'drive-by angiography' by nephrologists. While RAS is common; it is unknown whether RAS in an individual patient causes hypertension or contributes to declining renal function. Diagnostic tests to delineate this dilemma are not available. Guidelines regarding timing, evaluation, treatment, and follow-up are not formulated.

What Is a Useful Definition of Ischemic Nephropathy?

The definition of 'ischemic nephropathy' is unclear. We will use 'impairment of renal function beyond occlusive disease of the main renal arteries'. However, deterioration of renal function in the presence of RAS may not reflect 'ischemia'. Under normal conditions blood flow to the kidney is far in excess of metabolic needs. Thus, moderate absolute reductions in blood flow

as in RAS may not be the sole or even a major contributor to reduced renal function. Thus, the view that reduction in renal blood flow directly results in ischemic damage is overly simplistic.

Atherosclerotic RAS, defined as >50% narrowing of the renal artery, is reported to occur in 11-42% of renal artery studies. In autopsy studies, RAS was found in 4 - 50% of subjects, with much higher prevalence in those >60 years of age, compared to those <60 years of age (16.4 vs. 5.5%). More recent reports of RAS found during cardiac catheterization describe a 14-29% prevalence in individuals with coronary disease and <10% of individuals with normal coronary arteries. The prevalence of RAS lesions is a function of both age and risk factors such as smoking, hypertension, dyslipidemias and diabetes.

Does RAS Cause CKD or ESRD?

RAS is a putative cause of end-stage renal disease (ESRD) in approximately 5% of ESRD patients. The demonstration of RAS is necessary but not sufficient to conclude that decreases in GFR are caused by renal artery narrowing. The anatomic demonstration of RAS does not prove functionality of the lesion.

Do We Know the Natural History of RAS?

It is difficult to ascertain the natural history of RAS because many studies lack a consistent, agreed upon primary outcome. Surrogate outcomes including decrease in renal artery diameter, decline in GFR and renal atrophy have been used.

Internal renal artery diameter is commonly assessed by angiography or duplex scans. Estimates of progression are between 11 and 60% and occlusion, 0.01 and 3% of renal arteries. Patients undergoing renal arteriography studies during cardiac catheterization appear to have less progression and occlusion than those undergoing evaluation for CKD, PVD or during a workup for secondary hypertension. Importantly,



studies are in agreement that progression to complete occlusion is rare. Loss of GFR may be a more useful endpoint for ischemic nephropathy progression. Importantly, there does not appear to be a tight relationship between renal artery diameter and loss of GFR.

Leertouwer et al. analyzed the need for renal replacement therapy in patients with untreated RAS = 50% stenosis (n = 126), compared to controls without RAS (n = 260) matched for age and gender. Despite RAS = 50% stenosis no patient developed ESRD during a 10-year follow-up. Serum creatinine levels, although approximately 20% higher in patients with RAS compared to controls, remained stable during follow-up. In another series of 68 patients with 'incidental' RAS = 70% 'clinical' progression leading to ESRD or revascularization occurred in <12%. Incidental RAS does not necessarily progress to ESRD. Prevailing opinion holds that intervention in lesions <70% is not helpful. However, if relatively less severe lesions affected downstream events, it would seem reasonable to intervene earlier in the course of RAS.

In summary, knowledge about the natural history of atherosclerotic RAS is limited due to the variation in study cohorts, potential bias for selection, and follow-up of survivors. From the data available, the best predictor of progression to ESRD may be GFR at presentation and/or biopsy proven renal fibrosis score.

How Often Are Therapeutic Interventions Performed in Patients with RAS?

The introduction of stenting increased renal artery interventions from 13,380 to 21,600 for Medicare beneficiaries between 1996 and 2000. Interventional cardiologists perform most of these procedures. In contrast, because of the perceived risk of systemic atheroemboli with potentially catastrophic results especially in patients with extensive disease, many nephrologists remain conservative. Technical advances, including the introduction of various protective devices, may diminish risks. Nevertheless, the outcomes for these patients remain uncertain. Since the incidence of ischemic nephropathy appears to be increasing and techniques to diagnose and reversely stenotic lesions are available, it is important that interventionalists (cardiologists, interventional radiologists, and vascular surgeons) collaborate with nephrologists in choosing selected patients in whom stenting would prevent progression of ischemic nephropathy.

The summary of three prospective randomized trials comparing medical therapy for renovascular hypertension to percutaneous renal artery angioplasty (PTRA), so far published, are small, and contained selected patient populations, none of which were incidentally discovered RAS. However, they sought to standardize blood pressure

outcome measurement and to randomize patients prospectively. Each was different, but all found less major benefits accrued in PTRA groups than reported by observational studies alone. Crossover rates from medical to angioplasty arms were significant, however, and emphasize the importance of restoring blood supply in selected patients, particularly those with bilateral disease.

When Should Renal Revascularization for Ischemic Nephropathy Be Considered?

Several studies report ambiguous clinical results from composite clinical outcomes after interventional procedures. The DRASTIC study is the most extensive prospective controlled trial of angioplasty versus medical therapy for RAS. No difference between the two treatments could be found in this intention-to-treat analysis. However, the cross over of patients from the medical to the angioplasty group was numerous so that the study results are uninterpretable. The Essai Multicentrique Medicaments versus Angioplastie (EMMA) study group concluded that in unilateral atherosclerotic renal artery stenosis, angioplasty is a drug-sparing procedure that involves some morbidity. Previous uncontrolled and unblinded assessments of angioplasty overestimated its potential for lowering blood pressure.

CORAL is a prospective, multicenter unblinded two arm-randomized trial of the clinical outcomes of medical therapy plus stenting of atherosclerotic renal artery stenosis, compared to medical therapy alone. The goal is to enroll 1,080 patients by the first quarter of 2007. Entry will require hypertension (defined as systolic BP >155 mm Hg during therapy with two or more drugs) and at least one non-occluded artery with at least 60% stenosis. Both arms will feature a 'forced' medical therapy to lower target blood pressure levels $\geq 140/90$ mm Hg, based on anti renin-angiotensin system therapy and additional drugs as needed. After informed consent is obtained and the RAS lesion is confirmed, patients will be randomly assigned to receive stent placement or not. Those receiving stents will also have a 'distal protection device' employed (Angiogard) to minimize atheroembolic complications. Follow-up time will be 3.5-5 years. The primary endpoint in CORAL is a composite endpoint, defined as 'event-free survival' from cardiovascular and renal adverse events. Events are cardiovascular or renal death, stroke, myocardial infarction, hospitalization for heart failure, and progressive renal insufficiency, defined as doubling serum creatinine or requiring dialysis. This trial seeks to truly establish the prevalence of restenosis, the benefits and risks of endovascular procedures in technically capable centers, and to determine whether or not stent placement materially improves cardiovascular and renal outcomes.

Reference : *Am J Nephrol* 2007;27:212-220



RENAL ARTERIAL DISEASE

A. Prevalence and Natural History

Renal artery stenosis (RAS) is both a common and progressive disease in patients with atherosclerosis and a relatively uncommon cause of hypertension. From a limited epidemiological database, it is estimated that atherosclerotic RAS may affect as many as 6.8% of people aged 65 years and older. However, atherosclerotic RAS is common in cohorts that have clinically evident atherosclerosis in other arterial circulations. For example, 22% to 59% of patients with PAD have hemodynamically significant RAS (as defined by a stenosis greater than 50%). In individuals with histories of proven MI, 12% of postmortem examinations demonstrate the presence of an RAS of 75% or greater. Despite the high prevalence of RAS in these atherosclerotic subgroups, it remains controversial as to which lesions are associated with important clinical sequelae.

B. Clinical Clues to the Diagnosis of RAS

RECOMMENDATIONS

Class I

1. The performance of diagnostic studies to identify clinically significant RAS is indicated in patients with

the onset of hypertension before the age of 30 years. (Level of Evidence: B)

2. The performance of diagnostic studies to identify clinically significant RAS is indicated in patients with the onset of severe hypertension [as defined in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report] after the age of 55 years. (Level of Evidence: B)

3. The performance of diagnostic studies to identify clinically significant RAS is indicated in patients with the following characteristics: (a) accelerated hypertension (sudden and persistent worsening of previously controlled hypertension); (b) resistant hypertension (defined as the failure to achieve goal blood pressure in patients who are adhering to full doses of an appropriate 3-drug regimen that includes a diuretic); or (c) malignant hypertension (hypertension with coexistent evidence of acute end-organ damage; i.e., acute renal failure, acutely decompensated congestive heart failure, new visual or neurological disturbance, and/or advanced [grade III to IV] retinopathy). (Level of Evidence: C)

Clinical Clues to the Diagnosis of Renal Artery Stenosis

1. Onset of hypertension before the age of 30 years or severe hypertension after the age of 55.* (Class I; LOE B)
2. Accelerated, resistant, or malignant hypertension.* (Class I; LOE C)
3. Development of new azotemia or worsening renal function after administration of an ACE inhibitor or ARB agent. (Class I; IDE B)
4. Unexplained atrophic kidney or size discrepancy between kidneys of greater than 1.5 cm. # (Class I; LOE B)
5. Sudden, unexplained pulmonary edema. (Class I; LOE B)
6. Unexplained renal dysfunction, including individuals starting renal replacement therapy. (Class IIa; LOE B)
7. Multi-vessel coronary artery disease. (Class IIb; LOE B)
8. Unexplained congestive heart failure. (Class IIb; LOE C)
9. Refractory angina. (Class IIb; IDE C)

Diagnostic Studies

Noninvasive Imaging; ● Duplex ultrasound
● Gadolinium enhanced MRA ● CT angiography

Negative noninvasive test result but high clinical index of suspicion

Renal angiography (and hemodynamics)

Evidence of RAS

See Treatment Algorithm

Evidence of RAS

See Treatment Algorithm

Invasive Imaging:
Abdominal aortography to assess the renal arteries during coronary and peripheral angiography.

Evidence of RAS

See Treatment Algorithm

Figure-1: Clinical clues to the diagnosis of renal artery stenosis, *For definition of hypertension, please see Chobanian AV, Bakris GL, Black MR, et al. The Seventh Report of the joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. JAMA 2003;289:2560-72. # For example, atrophic kidney due to chronic pyelonephritis is not an indication for RAS evaluation. ACE= angiotensin-converting enzyme; ARE = angiotensin receptor blocking agent; CT= computed tomography; LOE = level of evidence; MRA = magnetic resonance angiography; RAS=renal artery stenosis.



4. The performance of diagnostic studies to identify clinically significant RAS is indicated in patients with new azotemia or worsening renal function after the administration of an ACE inhibitor or an angiotensin receptor blocking agent. *(Level of Evidence: B)*
5. The performance of diagnostic studies to identify clinically significant RAS is indicated in patients with an unexplained atrophic kidney or a discrepancy in size between the 2 kidneys of greater than 1.5 cm. *(Level of Evidence: B)*
6. The performance of diagnostic studies to identify clinically significant RAS is indicated in patients with sudden, unexplained pulmonary edema (especially in azotemic patients). *(Level of Evidence: B)*

Class IIa

1. The performance of diagnostic studies to identify clinically significant RAS is reasonable in patients with unexplained renal failure, including individuals starting renal replacement therapy (dialysis or renal transplantation). *(Level of Evidence: B)*

Class IIb

1. The performance of arteriography to identify significant RAS may be reasonable in patients with multivessel coronary artery disease and none of the clinical clues (Fig-1) or PAD at the time of arteriography. *(Level of Evidence: B)*
2. The performance of diagnostic studies to identify clinically significant RAS may be reasonable in patients with unexplained congestive heart failure or refractory angina. *(Level of Evidence: C)*

Several clinical features raise the suspicion of RAS and provide relative indications for application of more specific diagnostic testing strategies. Such diagnostic testing strategies should be performed when establishment of the RAS diagnosis is likely to offer information that can beneficially be linked to an effective patient-specific treatment strategy. See Figure-1 for a summary.

C. Diagnostic Methods

RECOMMENDATIONS

Class I

1. Duplex ultrasonography is recommended as a screening test to establish the diagnosis of RAS. *(Level of Evidence: B)*
2. Computed tomographic angiography (in individuals with normal renal function) is recommended as a screening test to establish the diagnosis of RAS. *(Level of Evidence: B)*
3. Magnetic resonance angiography is recommended as a screening test to establish the diagnosis of RAS. *(Level of Evidence: B)*

4. When the clinical index of suspicion is high and the results of noninvasive tests are inconclusive, catheter angiography is recommended as a diagnostic test to establish the diagnosis of RAS. *(Level of Evidence: B)*

Class III

1. Captopril renal scintigraphy is not recommended as a screening test to establish the diagnosis of RAS. *(Level of Evidence: C)*
2. Selective renal vein renin measurements are not recommended as a useful screening test to establish the diagnosis of RAS. *(Level of Evidence: B)*
3. Plasma renin activity is not recommended as a useful screening test to establish the diagnosis of RAS. *(Level of Evidence: B)*
4. The captopril test (measurement of plasma rennin activity after captopril administration) is not recommended as a useful screening test to establish the diagnosis of RAS. *(Level of Evidence: B)*

Renal artery stenosis is best diagnosed with an imaging modality. The ideal tool should evaluate both the main and accessory renal arteries, assess the hemodynamic significance of the demonstrated lesions, identify the site and severity of the stenosis, and identify associated perirenal pathology, including the presence of an abdominal aortic aneurysm or renal or adrenal masses. Direct imaging modalities such as duplex ultrasound, CTA, and MRA are best suited to serve as effective diagnostic screening methods. The choice of imaging procedure will depend on the availability of the diagnostic tool, the experience and local accuracy of the chosen modality, and patient characteristics (e.g., body size, renal function, contrast allergy, and presence of prior stents or metallic objects that may serve as contraindications to MRA or CTA techniques).

SUMMARY OF NONINVASIVE RENAL ARTERY DIAGNOSTIC IMAGING STRATEGIES.

There are relative advantages and disadvantages to each of the aforementioned imaging modalities. Captopril renography has been validated in a large number of patients but is limited in value to a subset of all potential renovascular patients and is of limited value in patients with significant azotemia, bilateral RAS, or RAS to a single functioning kidney. Duplex renal sonography, because of the critical role of the sonographer, is accurate in experienced laboratories and is thus ideally performed in high-volume accredited laboratories. The diagnostic accuracy of these ultrasound-based examinations is further limited in patients with large body habitus or intestinal gas obscuring visualization of the entirety of the renal artery. Computed tomographic angiography currently provides higher spatial resolution than MRA and



may be more readily available; however, the requirement to use iodinated contrast makes it an unattractive modality in patients with impaired renal function. Gadolinium-enhanced MRA provides excellent and less nephrotoxic characterization of the renal arteries, surrounding vessels, renal mass, and perhaps renal function, but it remains the most costly renal artery examination. It is far less useful in patients who have had a metallic renal artery stent placed because of the inability to image inside of the stent to detect restenosis. Comparisons of contrast-enhanced 3-dimensional MRA and multidetector CTA with digital subtraction catheter angiography in a large number of arterial segments have demonstrated equally high sensitivities for detection of hemodynamically significant stenoses for MRA and CTA (greater than 90%), with excellent interobserver and intermodality agreement (kappa equals 0.88 to 0.90).

1. Catheter Angiography.

The indications for catheter based contrast renal angiography include (a) individuals in whom there are prespecified indications to suspect clinically important RAS ("clinical clues") in whom definitive diagnostic noninvasive images cannot be obtained and (b) individuals in whom these prespecified clinical indications and patient consent have been documented and in whom concomitant angiographic access has been obtained for peripheral angiography or coronary angiography. Catheterbased contrast angiography is associated with a

low rate of serious adverse outcomes.

2. Renin.

A. SELECTIVE RENAL VEIN RENIN STUDIES.

The utility of renal vein renin measurements depends on the ability to differentiate the unilateral elevation of renin concentration from the renal vein that drains the kidney with renal artery disease from the systemic plasma renin levels and/or renal vein renin levels collected from the contralateral (normal) kidney. The test may have more utility in establishing an indication for nephrectomy in patients with renal artery occlusion than in identifying patients with RAS who may derive benefit from revascularization; for pediatric patients with questionably severe RAS before revascularization; or for patients with very marked aortoiliac-renal atherosclerosis, in whom revascularization could carry unusually high risk.

B. PLASMA RENIN ACTIVITY: CAPTOPRIL TEST.

The overall sensitivity of this test is 61%, with a specificity of 86% for the detection of RAS; however, this test is less accurate in patients who are volume expanded or who have chronic renal failure, bilateral renal artery disease, or disease to a solitary functioning kidney. Plasma renin activity is not recommended as a useful screening test to establish the diagnosis of RAS.

D. Treatment of Renovascular Disease: Renal Artery Stenosis

Treatment of renal arterial disease should serve to aid in

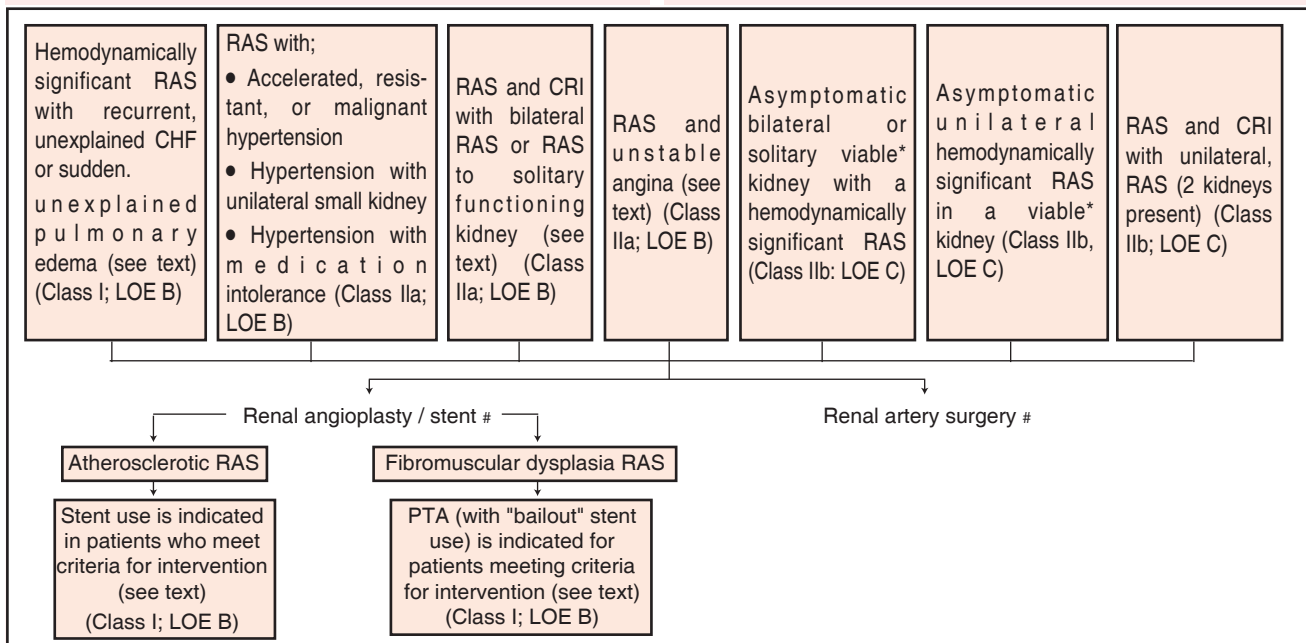


Figure-2: Indications for revascularization. *Viable means kidney linear length greater than 7 cm. # It is recognized that renal artery surgery has proven efficacy in alleviating renal arterial stenosis (RAS) due to atherosclerosis, and fibromuscular dysplasia. Currently, however, its role is often reserved for individuals, in whom less invasive percutaneous RAS interventions are not feasible. CHF - congestive heart failure; CRI = chronic renal insufficiency; LOE = level of evidence; PTA = percutaneous transluminal angioplasty.



the normalization of blood pressure and to preserve renal function. Both medical (pharmacological) and revascularization strategies should be considered for patients with documented renal arterial disease. A treatment algorithm is provided in Figure-2.

1. Medical Treatment.

RECOMMENDATIONS

Class I

1. Angiotensin-converting enzyme inhibitors are effective medications for treatment of hypertension associated with unilateral RAS. (*Level of Evidence: A*)
2. Angiotensin receptor blockers are effective medications for treatment of hypertension associated with unilateral RAS. (*Level of Evidence: B*)
3. Calcium-channel blockers are effective medications for treatment of hypertension associated with unilateral RAS. (*Level of Evidence: A*)
4. Beta-blockers are effective medications for treatment of hypertension associated with RAS. (*Level of Evidence: A*)

Multiple studies have now shown that ACE inhibitors and calcium-channel blockers are effective in the treatment of hypertension in the presence of RAS. These results address primarily the treatment of hypertension, but diminution in the progression of renal disease has also been demonstrated. There is also evidence that alternative therapies, based largely on chlorothiazide, hydralazine, and beta-blockers, also appear effective to achieve target blood pressures in individuals with RAS. Although the angiotensin II receptor blockers also have an evidence base of efficacy for normalization of blood pressure in individuals with RAS, their effects need to be tested further in large randomized trials. There are currently few objective clinical clues that permit selection of specific patient cohorts that would best be treated by medical therapy versus renal arterial revascularization, which remains an area of active clinical investigation. Individuals with atherosclerotic disease and hypertension should be treated according to the goals of the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.

2. Indications for Revascularization.

A. ASYMPTOMATIC STENOSIS.

RECOMMENDATIONS

Class IIb

1. Percutaneous revascularization may be considered for treatment of an asymptomatic bilateral or solitary viable kidney with a hemodynamically significant RAS. (*Level of Evidence: C*)
2. The usefulness of percutaneous revascularization of an

asymptomatic unilateral hemodynamically significant RAS in a viable kidney is not well established and is presently clinically unproven. (*Level of Evidence: C*)

There are no well-controlled prospective randomized investigations to measure the relative risk and benefit of endovascular interventions (or associated medical therapies) in individuals with asymptomatic renal artery disease, and thus, the role of such interventions remains controversial. Recommendations regarding the role of percutaneous revascularization of asymptomatic renal disease are made largely on the basis of expert opinion and are not based on evidence that treatment of asymptomatic RAS improves any renal or systemic outcome, including renal preservation, blood pressure, or cardiovascular morbidity or mortality. Therefore, these recommendations must be individualized for the patient by each treating physician.

B. HYPERTENSION.

RECOMMENDATIONS

Class IIa

1. Percutaneous revascularization is reasonable for patients with hemodynamically significant RAS and accelerated hypertension, resistant hypertension, malignant hypertension, hypertension with an unexplained unilateral small kidney, and hypertension with intolerance to medication. (*Level of Evidence: B*)

The current evidence base suggests that patients with severe atherosclerotic RAS and accelerated, resistant, and malignant hypertension may expect to receive some clinical benefit, including improved blood pressure control, the need for fewer medications, or both. However, "cure" of hypertension is rare, improvement in blood pressure control is common, and a moderate fraction of individuals do not achieve measurable benefit.

C. PRESERVATION OF RENAL FUNCTION.

RECOMMENDATIONS

Class IIa

1. Percutaneous revascularization is reasonable for patients with RAS and progressive chronic kidney disease with bilateral RAS or a RAS to a solitary functioning kidney. (*Level of Evidence: B*)

Class IIb

1. Percutaneous revascularization may be considered for patients with RAS and chronic renal insufficiency with unilateral RAS. (*Level of Evidence: C*)

Revascularization is effective in stabilizing or improving renal function in patients with symptomatic atherosclerotic RAS. Several factors may argue against renal revascularization or predict poorer outcomes, including the presence of proteinuria greater than 1 g every 24



hours, renal atrophy, severe renal parenchymal disease, and severe diffuse intrarenal arteriolar disease. Moreover, the adverse consequences of renal atheroembolization at the time of surgical revascularization have been documented. Similarly, potentially severe atheroembolization may be provoked by renal percutaneous revascularization methods.

D. IMPACT OF RAS ON CONGESTIVE HEART FAILURE AND UNSTABLE ANGINA.

RECOMMENDATIONS

Class I

1. Percutaneous revascularization is indicated for patients with hemodynamically significant RAS and recurrent, unexplained congestive heart failure or sudden, unexplained pulmonary edema (see text). (Level of Evidence: B)

Class IIa

2. Percutaneous revascularization is reasonable for patients with hemodynamically significant RAS and unstable angina (see text). (Level of Evidence: B)

The potential physiological benefits of renal stent placement include reperfusion of the ischemic kidney(s), resulting in a reduction in the stimulus to renin production, which decreases angiotensin and aldosterone production, thereby decreasing peripheral arterial vasoconstriction and the tendency to develop an expanded extracellular fluid volume. Improvement in renal perfusion enhances glomerular filtration and therefore promotes natriuresis. Finally, in patients with a solitary kidney or bilateral RAS, the ability of the patient to tolerate long-term administration of angiotensin antagonist medications may be facilitated by relief of a hemodynamic renal artery obstruction. The recommendations in these guidelines are intended to apply to individuals with refractory heart failure or unstable angina in whom nonrenal exacerbating factors have been evaluated and in whom there are reasonable clinical indications to suggest the presence of RAS (e.g., systemic atherosclerosis), as is more fully described in the full-text version of the guidelines.

3. Catheter-Based Interventions.

RECOMMENDATIONS

Class I

1. Renal stent placement is indicated for ostial atherosclerotic RAS lesions that meet the clinical criteria for intervention. (Level of Evidence: B)
2. Balloon angioplasty with bailout stent placement. If necessary is recommended for fibromuscular dysplasia lesions. (Level of Evidence: B)

Percutaneous transluminal renal balloon angioplasty is the treatment of choice for symptomatic RAS caused by

fibromuscular dysplasia. However, in atherosclerotic RAS, balloon angioplasty alone is associated with a lower procedural success rate and a higher restenosis rate. Aorto-ostial stenoses represent the most common atherosclerotic lesions and are prone to vascular recoil due to confluent plaque that extends from the wall of the aorta into the ostium of the renal artery. These atherosclerotic aorto-ostial lesions are generally considered unsuitable for treatment by balloon angioplasty alone.

Stent placement has consistently proven superior to balloon angioplasty in the treatment of renal artery atherosclerotic lesions. For renal artery atherosclerotic lesions, the larger the poststent minimal lumen diameter, as measured by quantitative vascular angiography, the better the late stent patency. Similar to coronary stents, larger-diameter renal arteries have lower restenosis rates than smaller-diameter vessels.

4. Surgery for RAS.

RECOMMENDATIONS

Class I

1. Vascular surgical reconstruction is indicated for patients with fibromuscular dysplastic RAS with clinical indications for interventions (same as for PTA), especially those exhibiting complex disease that extends into the segmental arteries and those having macroaneurysms. (Level of Evidence: B)
2. Vascular surgical reconstruction is indicated for patients with atherosclerotic RAS and clinical indications for intervention, especially those with multiple small renal arteries or early primary branching of the main renal artery. (Level of Evidence: B)
3. Vascular surgical reconstruction is indicated for patients with atherosclerotic RAS in combination with pararenal aortic reconstructions (in treatment of aortic aneurysms or severe aortoiliac occlusive disease). (Level of Evidence: C)

A. RESULTS OF OPERATIVE THERAPY.

Surgical treatment of renovascular hypertension affords good clinical outcomes. The risk of surgery increases in patients who require concomitant aortic reconstruction, in patients with renal insufficiency, and when aortic grafts are used as a source of the bypass graft. The need for reoperation has been reported in 5% to 15% and survival in 65% to 81% of patients.

Reference:

ACC/AHA Guidelines for the Management of Patients With Peripheral Arterial Disease (Lower Extremity, Renal, Mesenteric, and Abdominal Aortic), JACC, doi:10.1016/j.jacc.2005.10.009



HEART

Vol. 3 No. 2, 2007

Cardiology News

Same-Day Discharge After Elective PCI Is Safe and Feasible

To study the safety and feasibility of same-day discharge after PCI, 800 patients were randomized to same-day discharge or overnight hospital stay. 4 hours after the procedure, all patients were triaged to determine suitability for early discharge. In terms of the primary end point—a composite of death, MI, coronary artery bypass graft (CABG) surgery, repeat PCI, or puncture-related complication—among those deemed suitable for early discharge.

If a hospital is establishing day-care PCI, it is important to have at least one bed available for every five patients. The investigators point out that the results of the study might not be applicable to centers using glycoprotein IIb/IIIa inhibitors routinely during elective procedures, mainly because these drugs require a 12-hour infusion after PCI and as such are incompatible with same-day discharge. In addition, these findings should not be extrapolated to low-volume centers, where the level of experience might be less.

Circulation 2007

Migraine With Aura May Be Linked to Heart Disease Mortality

Data from a new study point to a possible association between migraine with aura and an increased risk of coronary heart disease mortality in women. Migraine may increase the relative risk of stroke, but the relationship between migraine and coronary heart disease (CHD) is less clear. A number of previous studies have suggested an association between migraine and chest pain, but not CHD. If confirmed in other populations, these findings imply that there may be biological links between migraine and systemic cardiovascular disease. The nature of any such links are unknown, but may involve pro-coagulable states or a generalized vascular disorder.

Cephalalgia 2007;27:368-371.

Higher Levels of Inflammatory Marker Associated with Depression in HF

Heart failure patients with higher levels of tumor necrosis factor receptor 1 (TNFr1), a marker of inflammation, had an increased risk for depression, up to almost 5-fold for those with levels in the highest quartile. The question this doesn't answer is whether depression is a brain response to cytokines or whether it is actually the depression that's causing the cytokines to be elevated. Depression has been shown to worsen patient outcomes in heart failure. Interestingly, though, the use of antidepressants in the depressed heart failure patients reduced depression scores but not the level of TNFr1, which remained significantly elevated in treated patients, at almost 60% higher than the reference group.

American College of Cardiology 56th Annual Scientific Sessions: March 24 - 27, 2007.

Ibuprofen May Reduce Protective Effects of Aspirin

The US Food and Drug Administration (FDA) has notified that ibuprofen may interfere with the benefits of aspirin taken for heart disease. Ibuprofen can interfere with the antiplatelet effect of low-dose aspirin which may render aspirin less effective when used for cardioprotection and stroke prevention. With occasional use of ibuprofen, there is likely to be minimal risk from any attenuation of the antiplatelet effect of low-dose aspirin, because of the long-lasting effect of aspirin on platelets. Patients who use immediate-release aspirin (not enteric-coated) and take a single dose of ibuprofen, 400 mg, should dose the ibuprofen at least 30 minutes or longer after aspirin ingestion, or more than 8 hours before aspirin ingestion to avoid attenuation of aspirin's effect. Other nonselective over-the-counter nonsteroidal anti-inflammatory drugs should be viewed as having the potential to interfere with the antiplatelet effect of low-dose aspirin unless proven otherwise. Analgesics that do not interfere with the antiplatelet effect of low-dose aspirin (such as acetaminophen or narcotics) should be considered for high-risk populations.

Sue Hughes, Medscape Medical News, September 12, 2006

Editorial Board

Dr. Omar Akramur Rab, MBBS, FCGP, FIAGP
Ahmed Kamrul Alam, M. Pharm, MBA

Executive Editor

Dipak Kumar Saha, M.Pharm, MBA
e-mail: dipak@squaregroup.com
Ph: 01713067311

Cholinor[®]

Ezetimibe

Tablet

Cholesterol absorption inhibitor

Cardipro[®] plus

Atenolol + Chlorthalidone

Tablet

**An ideal combination of
Beta-blocker & Diuretic**

Camlopril[®]

Amlodipine + Benazepril

Capsule

**Reduces the incidence of
Amlodipine induced edema**

Angilock[®] plus 100/12.5

Losartan potassium 100 mg +
Hydrochlorothiazide 12.5 mg

Tablet

**Greater convenience &
enhanced titration option
within Losartan family**

Editorial Note

Dear Doctor,
We are happy to present the 9th issue of "Insight Heart". It is a small endeavor to provide you compiled & updated information on cardiovascular diseases and its management. This issue is focused on "**RENAL ARTERIAL DISEASE**". We will appreciate your thoughtful comments to enrich the publication.

Thanks and regards.

For further information: Product Management Department, SQUARE Centre, 48, Mohakhali C/A, Dhaka-1212

Web : www.squarepharma.com.bd

Developed by: **dhakahealth**