



RAMA UNIVERSITY

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FACULTY OF NURSING

Renal Artery Stenosis



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Definitions

- **Renal artery stenosis** is narrowing or complete occlusion of one or both renal arteries, defined by radiograph imaging at
 - greater than 60% stenosis on renal Doppler
 - or*
 - greater than 50% on angiography
- **Ischaemic nephropathy** is a chronic reduction in GFR that occurs from a narrowing in the renal artery.
- **Renovascular HTN** (RVHTN) is HTN mediated by high levels of renin and angiotensin II, produced by an underperfused kidney behind a stenosed renal artery.

Epidemiology

- **RAS** has a prevalence of 0.2% to 5% in all hypertensive patients.
 - Atherosclerotic RAS accounts for 90% of all RAS.
 - ✦ Prevalence is as high as 25% in patients with CAD
 - ✦ 2% of ESRD pts is due to ischemic nephropathy
 - ✦ More common in people aged older than 50 years
 - ✦ Found more commonly in women than in men
 - Fibromuscular dysplasia accounts for 10% of clinical RAS
 - ✦ Females are 2 to 10 times more likely than males
 - ✦ Onset typically occurs before the age of 30

Aetiology

- **Atherosclerotic RAS:**
 - Atherosclerosis
 - Diabetes mellitus
 - Dyslipidemia
 - Smoking
- **Fibromuscular dysplasia:**
 - Medial fibroplasia (histological finding in 90% of cases)
 - Intimal and adventitial fibroplasia (less common)
 - Smoking
- **Other causes:**
 - Post-transplant (site of vascular anastomosis)
 - Miscellaneous renal arterial disease
 - Renal artery aneurysm
 - Accessory renal artery
 - Takayasu's arteritis
 - Atheroemboli
 - Thromboemboli
 - Williams syndrome
 - Neurofibromatosis
 - Spontaneous renal artery dissection
 - Arteriovenous malformations
 - Arteriovenous fistulas
 - Trauma
 - Abdominal radiotherapy
 - Retroperitoneal fibrosis.

Pathophysiology

- When the stenosis exceeds 50% reduction in vessel diameter → underperfusion of the kidney → the regulatory mechanism (renin-angiotensin system) fail → □ vascular resistance & □ sodium retention → worsening kidney function & difficult-to-control HTN
- RAS →
 - Atrophy of tubular cells
 - Fibrosis of the capillary tuft
 - Intra-renal arterial medial thickening.

Classification

- **Anatomical:**
 - Unilateral
 - Unilateral in a single functional kidney
 - Bilateral
 - Proximal
 - Distal
- **Severity:**
 - Moderate stenosis ($\geq 50\%$ of RA diameter)
 - Severe stenosis ($\geq 75\%$)
 - Total occlusion (100%)

Presentation

➤ In many cases, RAS has no symptoms until it becomes severe.

Signs & Symptoms:

- edema, usually in the legs, feet, or ankles
- drowsiness or tiredness
- generalized itching or numbness
- dry skin
- headaches
- weight loss
- appetite loss
- nausea
- vomiting
- sleep problems
- trouble concentrating
- darkened skin
- muscle cramps

Diagnosis

- RAS should be considered if
 - Age <30 or >50 when they developed HTN
 - NO FHx of HTN
 - Refractory hypertension (No improvement with using 3 or more of Anti HTN medications)
- Clinically (bruit on auscultation)
- Labs:
 - Serum creatinine
 - Serum potassium
 - Urine analysis and sediment evaluation
 - Aldosterone-to-renin ratio
- Duplex ultrasound (US + Doppler)
- Catheter angiogram
- Computerized tomographic angiography (CTA) scan
- Magnetic resonance angiogram (MRA)

Treatment

- **Atherosclerotic patient group:**
 - 1st line: Antihypertensive therapy + Life style modification + Statin + Antiplatelet agents
 - 2nd line: stenting + medical therapy + clopidogrel
 - 3rd line: surgery
- **Fibromuscular dysplasia :**
 - 1st line: Antihypertensive therapy + Life style modification + percutaneous renal artery balloon angioplasty
 - 2nd line: Surgery + renal artery stenting and dual antiplatelet therapy

THANK YOU