

HYPERTENSION

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SURAT**

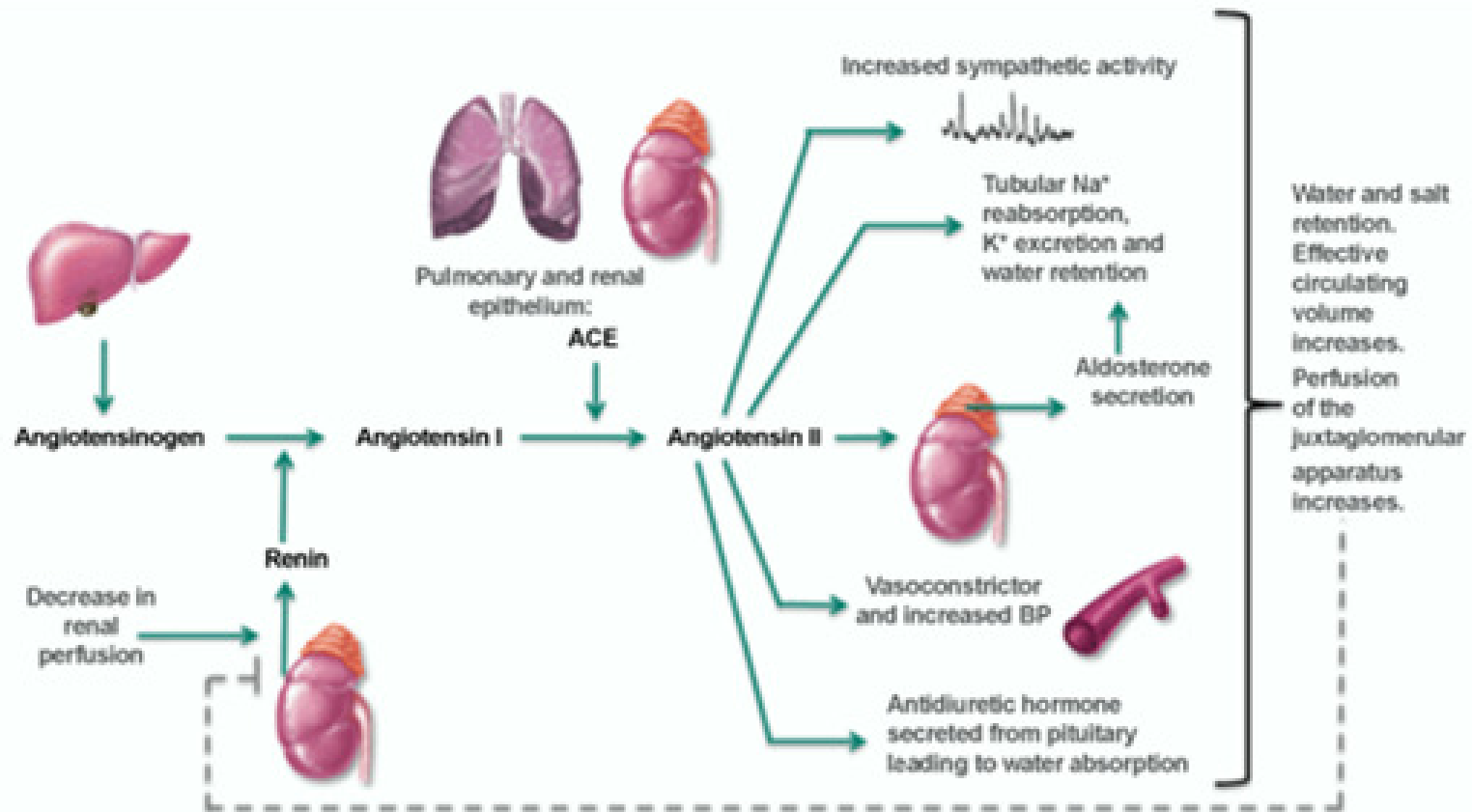
DEFINITION

- Increase arterial blood pressure
- Disease of vascular regulation
- Alteration in regulation of arterial pressure.

Predominant mechanisms of control are the

1. Central nervous system (CNS),
2. Renin-angiotensin-aldosterone system)
3. Extracellular fluid volume.

Renin-angiotensin System



TYPES OF HYPERTENSION

- **PRIMARY HYPERTENSION**
- **SECONDARY HYPERTENSION**
- **ACCELERATED HYPERTENSION**

CLASSIFICATION OF BLOOD PRESSURE FOR ADULTS

BP CLASSIFICATION	SBP (MM HG)	DBP (MM HG)
Normal	< 120	<80
Prehypertension	120--139	80--89
Stage 1 hypertension	140—159	90--99
Stage 2 hypertension	>160	>100

PRIMARY HYPERTENSION

- Also called as Essential Hypertension
- Approx. 95% of patients
- Diastolic -- 90 mm of Hg
- Systolic -- 140 mm of Hg or more

CAUSES

- Idiopathic
- Hyperactivity of sympathetic vasoconstricting nerves
- Presence of vasoactive substance on smooth muscle
- Increased cardiac output, followed by arteriole constriction
- Excessive dietary sodium intake, sodium retention,
- Familial (genetic) tendency

ISOLATED SYSTOLIC HYPERTENSION

- Systolic BP elevation in the absence of elevated diastolic BP is termed isolated systolic hypertension

SECONDARY HYPERTENSION

- Occurs in approx. 5% of patients
- **Renal pathology:**
 - Congenital anomalies, pyelonephritis, renal artery obstruction, acute and chronic glomerulonephritis
 - Reduced blood flow to kidney causes release of renin. Renin reacts with serum protein in liver
- **Coarctation of aorta**
- **Endocrine disturbances:**
 - Pheochromocytoma
 - Adrenal cortex tumors
 - Cushing's syndrome
 - Hyperthyroidism
- Medications such as estrogens, sympathomimetics, antidepressants, NSAIDs, steroids

Consequences of Hypertension

- Damages blood vessels in the brain, eyes, heart, and kidneys
- Increases the risk of stroke, angina, MI, blindness, and heart and kidney failure
- Blood vessel damage occurs through arteriosclerosis in which smooth muscle cell proliferation, lipid infiltration, and calcium accumulation occur in the vascular epithelium
- Damage to heart, brain, eyes, and kidneys is termed target organ disease; this is the major object of prevention in patients with high BP

Consequences of Hypertension

- Cerebro-Vascular stroke
- Angina, Myocardial Infarct
- Blindness
- Heart and Kidney failure
- Arteriosclerosis
- Lipid infiltration and calcium accumulation
- Target organ disease

Risk Factors

- Increase in incidence is associated with the following risk factors :-
 - Age:- between 30 and 70
 - Race:- Black
 - Overweight, sleep apnea
 - Family history
 - Smoking
 - Sedentary lifestyle
 - Diabetes mellitus
 - Metabolic syndrome

CLINICAL MANIFESTATIONS

- Usually Asymptomatic
- May cause
 - Headache
 - Dizziness
 - Blurred vision in malignant hypertension
- BP readings more than 140/90 mm of Hg

DIAGNOSTIC EVALUATION

- FBS, PP2BS
- Lipid profile
- Renal Function
- Serum Potassium
- Urine Analysis
 - Proteinuria
 - Catecholamines (pheochromocytoma = VMA)
- ECG
- Chest X-ray
- Renal scan for Renal artery stenosis

MANAGEMENT(lifestyle modifications)

- Lose weight if BMI > 25.
- Limit addiction. e.g. alcohol, smoking
- Smoking cessation
- Regular aerobic exercise
- 30 to 45 minutes of brisk walking most days.
- Restrict sodium intake to 2.4 g or less per day
- Reduce dietary fat and cholesterol
- Consider reducing coffee and caffeine intake
- Yoga, Pranayam, Anti- Stress therapy, Meditation
- Only for Mild Hypertension and over 3 – 6 months

CONSIDERATIONS IN SELECTING THERAPY

- **Age:-** some adverse effects may not be tolerated well by elderly people
- **Concomitant diseases and therapies:-** some agents also treat migraines, benign prostatic hyperplasia, heart failure
- **Quality of life impact:-** tolerance of adverse effects
- **Economic considerations:-** newer agents very expensive

ANTI-HYPERTENSIVE DRUG GROUPS

- Diuretics
- Beta-adrenergic blockers
- Alpha-receptor blockers
- Central alpha agonists
- Peripheral adrenergic agents
- Combined alpha and beta-adrenergic blockers
- ACE inhibitors
- Angiotensin receptor blockers
- Calcium antagonists
- Direct vasodilators

1. Diuretics

- Pottasium sparing – Spironolactone
- Non Pottasium sparing – Frusemide

2. Beta-adrenergic blockers

- Atenolol, Metoprolol, Proprenolol

3. Alpha-receptor blockers

- Prazosin

4. Central alpha agonists

- Clonidine ,Alpha methy dopa

5. Combined alpha and beta-adrenergic blockers

- Labetalol

6. ACE inhibitors

- Enalapril ,Captopril , Ramipril

7. Angiotensin receptor blockers

- Losartan, Telmisartan

8. Calcium antagonists

- Nifedipin , Amlodipin, Diltazium

9. Direct vasodilators

- Sodium Nitropruside
- Nitro-glycerine

Anti-Hypertensive Group	Indication	Contraindication
Alpha Blocker	Benign Prostatic Hypertrophy	Postural Hypotension
Beta Blocker	Myocardial infarction Angina	Asthma Heart Block Congestive Failure
ACE Inhibitor	Congestive Cardiac Failure Left Ventricular dysfunction Diabetic Nephropathy	Renal Vascular disease Peripheral Vascular disease Pregnancy
Angiotensine Receptor Blocker	Acute / Chronic Renal Failure Diabetic Nephropathy	Renal Vascular disease Peripheral vascular disease Pregnancy
Calcium Channel Blocker	Isolated Systolic hypertension	Congestive Failure
Thiazide diuretics	Congestive Cardiac Failure Left Ventricular dysfunction	Gout