e-Learning

by Dr. M.G.R EDUCATIONAL AND RESEARCH INSTITUTE

Dr. M.G.R

EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be University with Graded Autonomy Status)

Accredited by NAAC with 'A' Grade | An ISO Certified Institution

Maduravoyal, Chennai - 600 095, Tamilnadu, INDIA

DEFINITION

- **Hypertension** (HTN or HT), also known as high bloo pressure (HBP), is a long term medical condition in which the blood pressure in the arteries is persistently elevated.
- The SBP will be more than or equal of 140 mmHg and DBP will be more than or equal of 90 mmHg

TYPES

- **Pre hypertension**: SBP: 120-139 mmHg
  DBP: 80-89 mmHg

- **Hypertension stage I**: SBP: 140-159 mmHg
  DBP: 90-99 mmHg

- **Hypertension stage II**: SBP: More or equal to 160 mmHg
  DBP: More or equal to 100 mmHg

- **Pregnancy induced HTN**: because of increased production of hormones and enzymes during pregnancy.

ETIOLOGY

- **Primary HTN**: it is the elevation in BP without an identified cause.
- **Secondary HTN**: it is the elevation in BP with an exact cause. This type is account for 5-10% of total cases.
- The causes of Secondary HTN includes
  - Congenital narrowing of aorta

- Renal disease
- Endocrine disorders like cushing's syndrome
- Neurological disorders like brain tumors and head injury
- Sleep apnea
- Medications like oral contraceptive pills, NSAID, and coccaine
- Cirrhosis of liver

RISK FACTORS

- Age: chance of CAD after 50 yrs of age
- Alcohol, smoking and DM
- Excessive dietary intake of sodium
- Gender
- Family history
- Obesity
- Sedentary life style
- stress

PATHOPHYSIOLOGY

- The normal blood pressure is maintained by four mechanisms
  - **Sympathetic nervous system activities**
  - **Activities of vascular endothelium**
  - **Activities of renal system**
  - **Activities of endocrine system**

SYMPATHETIC NERVOUS SYSTEM ACTIVITIES

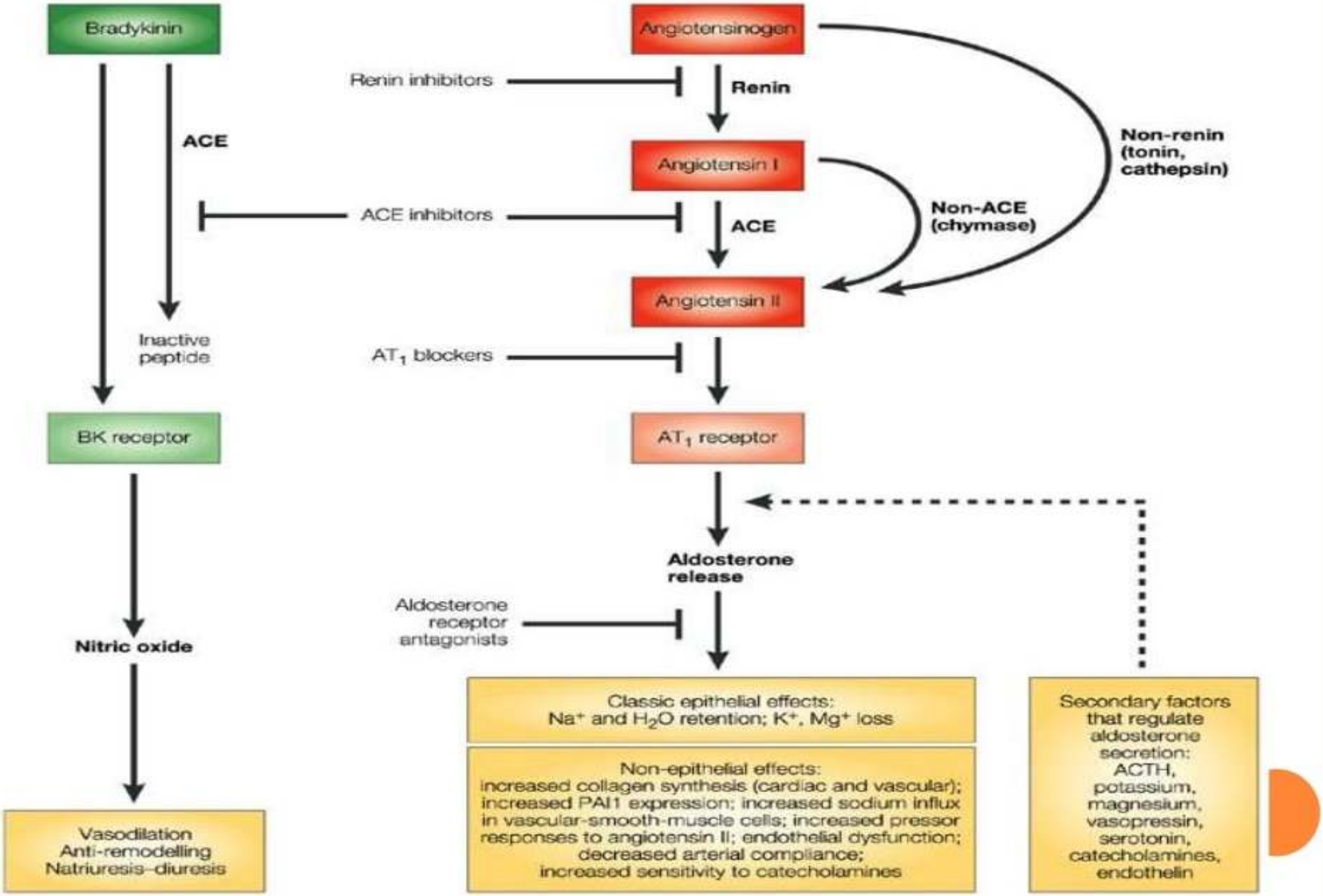
- When the BP is decreasing the activation of SNS will occur. The increased SNS activity increases the heart rate and cardiac contraction.
- The increased the heart rate and cardiac contraction produce vasoconstriction in the peripheral arterioles and promotes the release of renin from kidney.
- The net effect of SNS activation is to increase the arterial blood pressure by increasing cardiac output and systemic vascular resistance.

BP=CO X SVR

ACTIVITIES OF VASCULAR ENDOTHELIUM

- The vascular endothelium is a single cell layer that lines the blood vessal.
- It will produce vasoactive substances and growth factors like nitric acid, endothelin etc..
- These substances are potent vasoconstrictors and causes increases blood pressure level.

ACTIVITIES OF RENAL SYSTEM



Nature Reviews | Drug Discovery

ACTIVITIES OF ENDOCRINE SYSTEM

- When the angiotensin-II is stimulated in the adrenal cortex, it will secrete aldosterone.
- The aldosterone will stimulate the kidneys to retain sodium and water. Thus the BP and cardiac output will get increased.

CLINICAL FEATURES

- Some times the high blood pressure does not causes any symptoms, so that it is known as **silent killer disease.**
- In some patients the symptoms will develop like,

- Severe head ache
- Blurred vision
- Dizziness
- Nausea
- Vomiting
- Fatigue
- Confusion epistaxis
- Chest pain
- Shortness of breath
- Irregular heart beat
- papilledema

DIAGNOSTIC EVALUATIONS

- History collection and physical examination
- Medical history of diabetes mellitus
- Complete blood count
- Chest x-ray
- ECG

MANAGEMENT

- Mainly the management of hypertension is possible by two ways, which include
  - **Life style modification**
  - **Pharmacological therapy**

LIFE STYLE MODIFICATION

The life style modification measures mainly includes,

- Weight reduction
- DASH Diet (Dietary approaches to stop hypertension)
- Dietary sodium reduction
- Reduce alcohol
- Exercise
- Stress management

PHARMACOLOGICAL THERAPY

Various groups of drugs are used for the treatment of hypertension, collectively these drugs are called as anti-hypertensive drugs, which includes,

- **Diuretics**: it helps the kidneys to inhibit the sodium reabsorption in the distal convoluted tubules, ascending limb and loop of henle.

Eg: chlorothiazide, furosemide

- **Beta blockers:** These medications reduces the workload of the heart and blood vessal and causing the heart to beat slowly and with less force.

Eg: Atenolol, propanolol

- **Alpha blockers:** These medications causes the peripheral vasodilation of blood vessals.

Eg: Prazosin

- **Vasodilators:** These medications acting directly on the muscles in the wall of arteries and preventing the muscles from tightening and arteries from narrowing.

Eg: Nitroglycerin, Sodium nitro prusside

- **ACE Inhibitors:** This group of medication will reduce the conversion of A-I to A-II and prevents vasoconstriction.

Eg: Captopril, Ramipril

- **Calcium channel blockers:** These medicines will block the movement of extra cellular calcium into the cells and causing vasodilation and decreased heart rate.

Eg: Amlodipine, Verapamil

- Alternative therapies which are helpful to regulate blood pressure includes acupuncture, relaxation techniques and diversional therapies.


thank
you

Dr. M.G.R

EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be University with Graded Autonomy Status)

Accredited by NAAC with 'A' Grade | An ISO Certified Institution

Maduravoyal, Chennai - 600 095, Tamilnadu, INDIA