

Lecture -1-

د.رياض الموسوي

Hypertension

Hypertension is defined as either a sustained systolic blood pressure (SBP) of greater than 140 mm Hg or a sustained diastolic blood pressure (DBP) of greater than 90 mm Hg.

Categories Classification:-

- Normal: Less than (SBP.)120 over (DBP.) 80 (120/80)
- Prehypertension: (SBP.)120-139 over (DBP) 80-89
- Stage 1 Hypertension: (SBP.) 140-159 over (DBP) 90-99
- Stage 2 Hypertension: (SBP.)160 and above over (DBP) 100 and above

Etiology of Hrt:-

- 1- Primary :-Essential Hrt, 90% , for unknown cause.
- 2- Secondary Hrt: - due to diseases as, Cushing Syndrome, Thyrotoxicosis, and glomerulonephritis, pheochromocytoma.....etc.

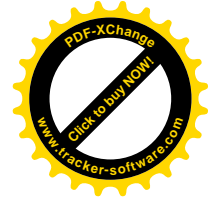
Risk Factors:-

- 1- Obesity
- 2- Age
- 3- Stressful conditions
- 4- High sodium intake
- 5- Smoking
- 6- Family history

Antihypertensive Drugs:-

1- Adrenergic Blockers :-

- a- β -Blockers (β 1 Blockers) :- Metoprolol, Atenolol, Acebutolol, esmolol, Betaxolol
- b- α -Blockers (α 1 Blockers) :- Prazosin, Terazosin, Doxazosin, Tamsulosin.
- c- α and β Blockers :- Labetolol, Carvedilol.



a) β -Blockers :-

The prototype β -blocker is propranolol as well as timolol, carteolol, sotalol, nadolol which act at both β_1 and β_2 receptors.

M.O.A:- The β -blockers reduce blood pressure primarily by decreasing cardiac output by blocking β_1 receptor which is found in SA node in heart. They may also decrease sympathetic outflow from the central nervous system (CNS) and inhibit the release of renin from the kidneys, thus decreasing the formation of angiotensin II and the secretion of aldosterone, so, decrease Na and water retention.

Pharmacokinetics:-

Water soluble (β_1 Blockers) are active orally, while (lipid soluble) non-selective β -Blockers are undergo extensive metabolism, All β -Blockers may take several weeks to develop their full effects.

Indications :-

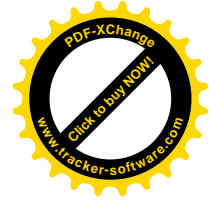
- 1- Hypertension
- 2- Hypertension with SVT, Previous MI, Angina pectoris, Chronic HF, and Migraine headache.
- 3- Thyrotoxicosis, to control tachycardia.

S.E :-

- 1- Hypotension.
- 2- Bradycardia
- 3- Impotence
- 4- Disturb lipid metabolism, (decrease HDL and Increase TG).
- 5- In patients with IHD, sudden withdrawal may cause MI, angine or even sudden death.

Contraindications :-

- 1- Bronchial asthma in non selective β blockers and selective one given cautiously to asthmatic patients.
- 2- D.M ?



b) α -Blockers :-

M.O.A:- They decrease the peripheral vascular resistance (PVR) by blocking α_1 receptors in smooth muscles in blood vessels, so, causes vasodilatation.

Indications :-

- 1- Benign prostatic hyperplasia (BPH) mainly tamsulosin.
- 2- Prazosin is seldom in mild to moderate hypertension (Combined with propranolol or diuretics) ?

S.E :-

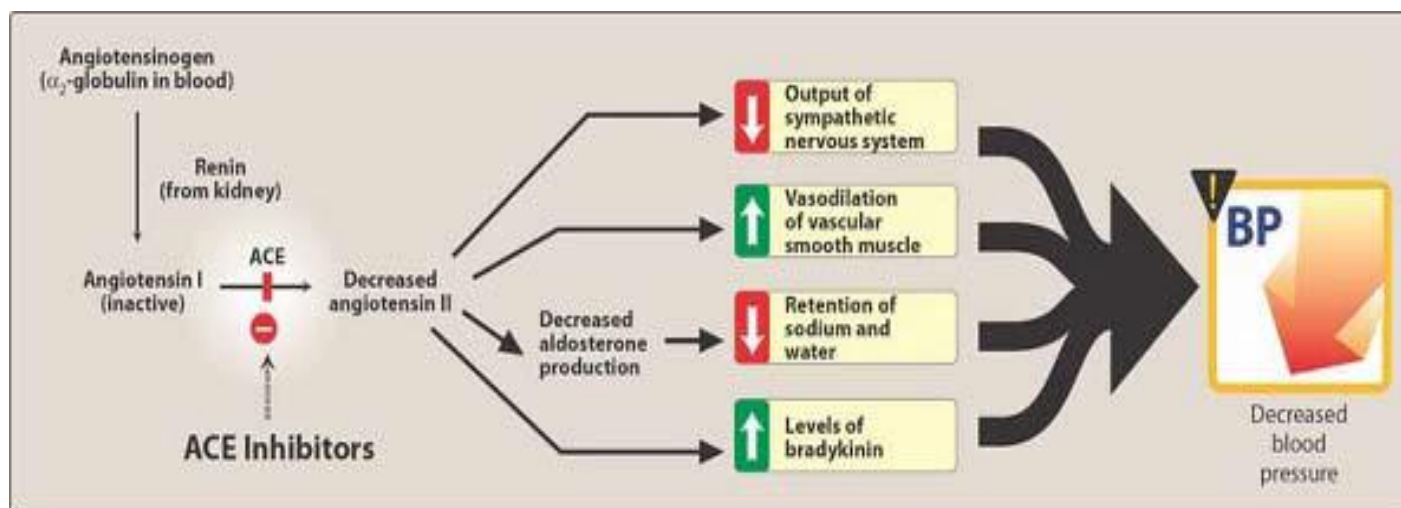
- 1- Postural hypotension
- 2- reflex tachycardia.
- 3- First-dose syncope
- 4- congestive HF in patients taking Doxazosin

c) α and β blockers :-

Labetalol used in emergency hypertension as i.v drips, Carvedilol blocks α_1 , β_1 , β_2 , it is an effective antihypertensive, and mainly used in HF.

2- Angiotensin converting enzyme inhibitors (ACEIs) :- Captopril, lisinopril, enalapril, fosinopril, quinapril, ramipril, benazepril, moexipril.

I.O.A:-

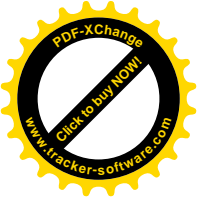


Indications :-

- 1- Hypertension
- 2- Slow progression of diabetic nephropathy
- 3- Chronic HF
- 4- 24 hours after end of MI as a standard care

S.E :-

- 1- Hypotension
- 2- Dry cough in 10 % of patients
- 3- Rash, fever, altered taste
- 4- angioedema
- 5- 1st-dose syncope
- 6- fetotoxic, teratogenic
- 7- Hyperkalemia



3- Angiotensin II-Receptor blockers (ARBs) Losartan, valsartan, candesartan, telmisartan, eprosartan, irbesartan, olmesartan.

The angiotensin II receptor blockers (ARBs) are alternatives to the ACE inhibitors. These drugs block the AT1 receptors. Their pharmacologic effects are similar to those of ACE inhibitors in that they produce arteriolar and venous dilation and block aldosterone secretion, thus lowering blood pressure and decreasing salt and water retention. ARBs do not increase bradykinin levels. ARBs decrease the nephrotoxicity of diabetes, making them an attractive therapy in hypertensive diabetics. Their adverse effects are similar to those of ACE inhibitors, although the risks of cough and angioedema are significantly decreased. ARBs are also fetotoxic and teratogenic.

4- Renin Inhibitors Aliskiren

It acts earlier in RAS on rennin, used in hypertension, less S.E than ARBs and ACEIs but also fetotoxic and contraindicated in pregnancy.

13/12/2012 Good Luck