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- Diet - High salt

• Obesity

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• Office Reasons

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• Kern dimensions

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endocrine disorder.

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- Drugs - steroids

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Local Mechanism - endo means, NO.



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Hydrochlorothiazide

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Renin - Angiotensin system inhibitors:

ACE Inhibitor.

Captopril $\rightarrow$ Fosinopril

Enalapril $\rightarrow$ Quinapril

Lisinopril $\rightarrow$ trandolapril.

Ramipril.

Angiotensin (AT1) Receptor blockers.

$\rightarrow$ Losartan $\rightarrow$ Valsartan $\rightarrow$ Irbesartan

$\rightarrow$ Candesartan $\rightarrow$ Telmisartan

$\Rightarrow$ Renin - Angiotensin system Inhibitors

Direct Renin Inhibitor $\rightarrow$ Aliskiren.

$\Rightarrow$ Sympathetic Inhibitors.

β - Adrenergic blockers $\rightarrow$ Propranolol

$\rightarrow$ Atenolol

$\alpha + \beta$ Adrenergic blockers $\rightarrow$ Labetalol, Carvedilol.

α - Adrenergic $\rightarrow$ Prazosin, Terazosin, Doxazosin

Central sympatholytics - clonidine, Methyldopa.

ALDOSTERONE ANTAGONISTS:

- Lower BP slightly

- used in conjunction with a thiazide diuretic to reduce K^+ loss

$\&$ Augment the Antihypertensive Action.

- Spironolactone $\rightarrow$ Gynaecomastia, Dry testis, Menstrual irregularities.

- well Attenuate hypertension Related vertigo &

DISADVANTAGES:

- Hypokalemia - Muscle pain, fatigue & loss of energy

- exhibit dysfunction in males
- carbohydrate intolerance, precipitation of diabetes due to inhibition of insulin release.
 - Dyslipidemia ↑ Atherogenic Risk (↑ TC in total & LDL cholesterol & TGs with lowering of HDL)
 - Hypertension ↑ incidence of gout. (Inhibit uric excretion)

ACE Inhibitors:

Dicarbonyl group

- Enalapril

- Lisinopril

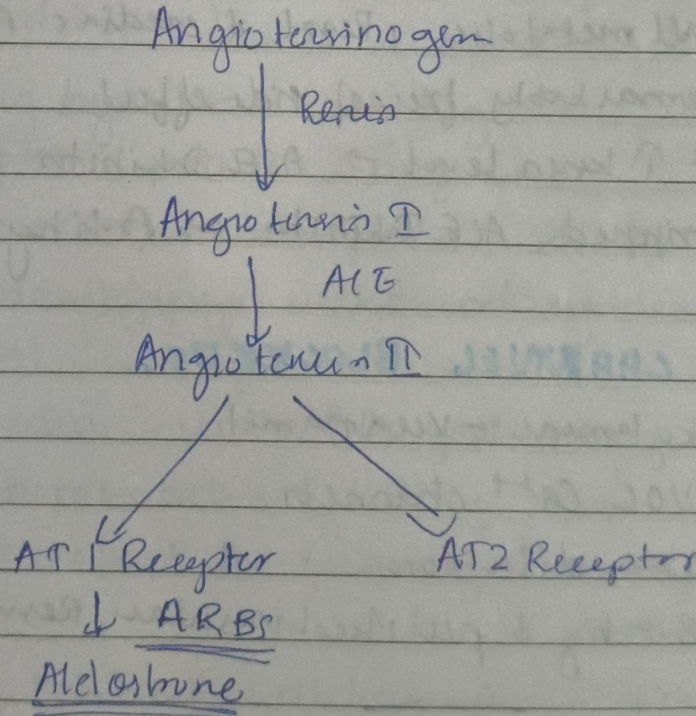
- Ramipril

- Perindopril

sulphydryl group - Captopril

Phosphoryl group - Fosinopril

MOA:



- ⇒ 1st choice drug in all grades of essential as well as Renovascular hypertension
- DM
- Nephropathy
- CHF, Angina, Post MI care

ADVANTAGES:

- Improves Renal blood flow.
- Retard diabetic nephropathy.
- Capacity to Regress left ventricular / vascular hypertrophy → Prevent Remodeling of heart in CHF
- Added with a diuretic / β Blocker → 40% patient will respond.

C/I → Pregnancy, Bilateral Renal Artery stenosis
Problems → Bradycardia, Hyponatremia

Angiotensin Receptor Blockers: → Losartan

- Do not interfere with degradation of bradykinin
- Complete blockade of Angiotensin II Action
- Result in direct AT-2 Receptor Activation



- Losartan 50mg/day
- Show all metabolic, Renal & cardiac Advantages of ACE Inhibitors
- Are Remarkably free of side effect.
- Do not ↑ K⁺ level → ACE Inhibitors Related cough is not
- Outstripped ACE Inhibitors as Anti-hypertensive. encouraged.

CALCIUM CHANNEL BLOCKERS:

Phenylalkylamine - Verapamil.

- Block VOLTAGE Ca⁺⁺ channels
- Arterioles dilatation
- Lowers B.P by ↓ peripheral vascular Resistance without CO.

Uses:

- one of the 1st choice drugs in hypertension
- Preferred in elderly
- Hypertensive emergencies → Nifedipine sublingual
- Pregnancy induced hypertension → Nifedipine

Ad → Do not compromise hemodynamics.

- Not C/I in Asthma, Angina, PVD
- No sedation or other CNS effects, cerebral perfusion
- No/minimal effect on quality of life
- No deleterious effect on plasma liquid profile, ^{and} urine

β-BLOCKERS:

They are effective in all grades of hypertension

selective β Blockers

Nonselective β Blockers

→ Atenolol

→ propranolol

→ esmolol

→ timolol

→ metoprolol

→ GI ↓ CO but PR may ↑

→ on chronic use PR may ↓ → CO-BP falls

→ They Act on heart (β₁) & kidney (β₂)

↓ HR
↓ CO
↓ BP

Renin ↓
↓ BP

Useful in young hypertensive with high Renin levels

→ Angina, post MI, migraine

Not given in CCF, bronchospasm, diabetes → fast hypoglycaemia
sudden stoppage withdrawal syndrome

→ They Reduce cardiac work & O₂ consumption

→ ↓ HR, maintenance of HBP

→ They are effective in ↓ the frequency & severity of Anginal Attacks compared to CCBs

→ Combination of beta-blockers with long-acting nifedipine is Rational

→ They can counteract tachycardia caused by

→ Abrupt discontinuation after chronic use may precipitate severe attacks including MI