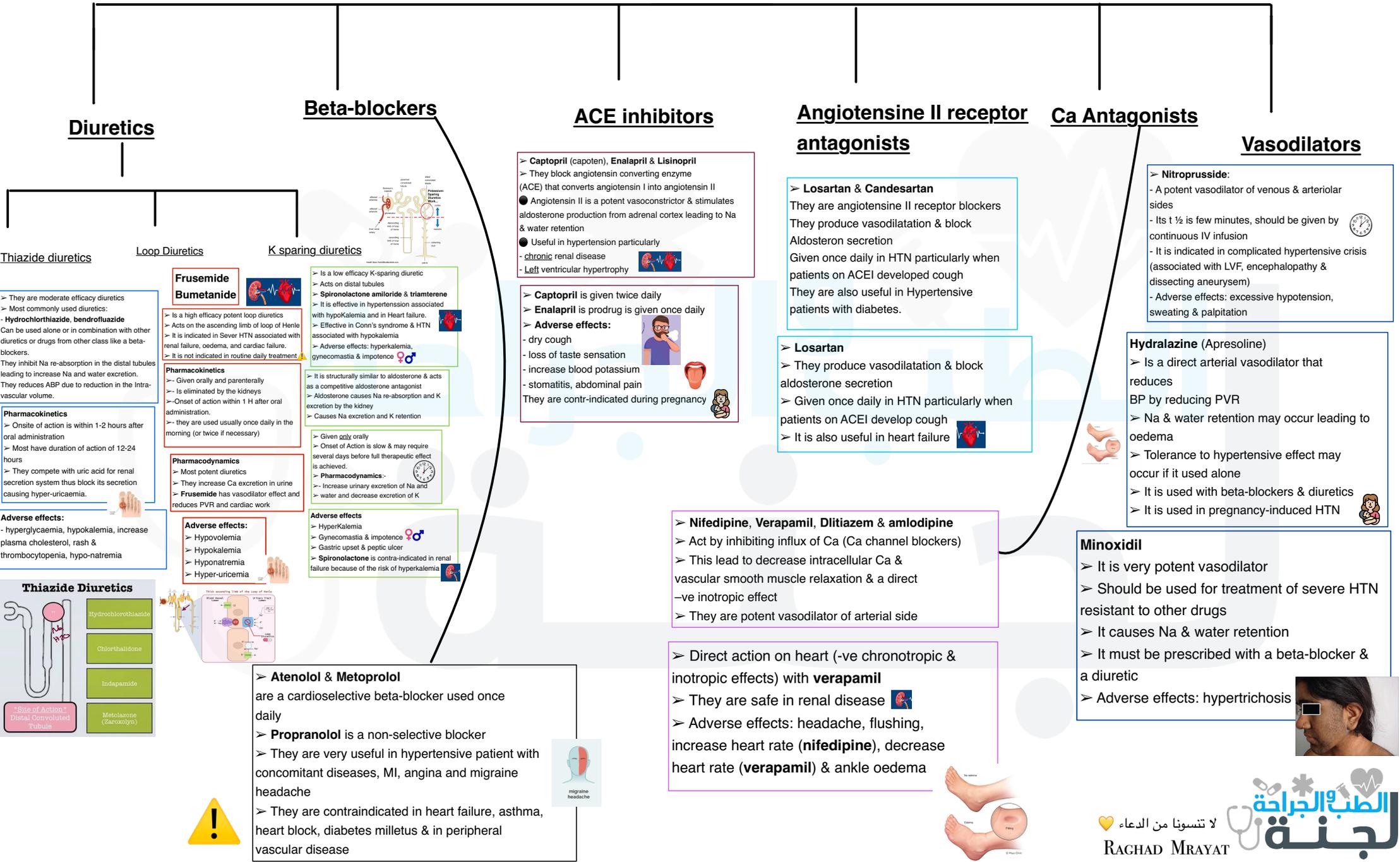


Classes of Antihypertensive Drugs

لَا حَوْلَ وَلَا قُوَّةَ إِلَّا بِاللَّهِ
"من كوز الجنة"



Diuretics

Thiazide diuretics

- They are moderate efficacy diuretics
- Most commonly used diuretics:
- Hydrochlorothiazide, bendrofluzazide**

Can be used alone or in combination with other diuretics or drugs from other class like a beta-blockers.

They inhibit Na re-absorption in the distal tubules leading to increase Na and water excretion. They reduces ABP due to reduction in the Intra-vascular volume.

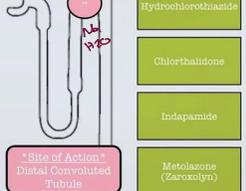
Pharmacokinetics

- Onset of action is within 1-2 hours after oral administration
- Most have duration of action of 12-24 hours
- They compete with uric acid for renal secretion system thus block its secretion causing hyper-uricaemia.

Adverse effects:

- hyperglycaemia, hypokalemia, increase plasma cholesterol, rash & thrombocytopenia, hypo-natremia

Thiazide Diuretics



Loop Diuretics

Frusemide

- Is a high efficacy potent loop diuretics
- Acts on the ascending limb of loop of Henle
- Is indicated in Sever HTN associated with renal failure, oedema, and cardiac failure.
- It is not indicated in routine daily treatment

Pharmacokinetics

- Given orally and parenterally
- Is eliminated by the kidneys
- Onset of action within 1 H after oral administration.
- they are used usually once daily in the morning (or twice if necessary)

Pharmacodynamics

- Most potent diuretics
- They increase Ca excretion in urine
- Frusemide** has vasodilator effect and reduces PVR and cardiac work

Adverse effects:

- Hypovolemia
- Hypokalemia
- Hyponatremia
- Hyper-uricemia

K sparing diuretics

- Is a low efficacy K-sparing diuretic
- Acts on distal tubules
- Spironolactone amiloride & triamterene**
- It is effective in hypertension associated with hypoKalemia and in Heart failure.
- Effective in Conn's syndrome & HTN associated with hypokalemia
- Adverse effects: hyperkalemia, gynecomastia & impotence

- It is structurally similar to aldosterone & acts as a competitive aldosterone antagonist
- Aldosterone causes Na re-absorption and K excretion by the kidney
- Causes Na excretion and K retention

- Given orally
- Onset of Action is slow & may require several days before full therapeutic effect is achieved.

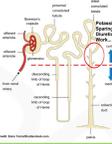
Pharmacodynamics:

- Increase urinary excretion of Na and water and decrease excretion of K

Adverse effects

- HyperKalemia
- Gynecomastia & impotence
- Gastric upset & peptic ulcer
- Spironolactone** is contra-indicated in renal failure because of the risk of hyperkalemia

Beta-blockers



Atenolol & Metoprolol

are a cardioselective beta-blocker used once daily

- Propranolol** is a non-selective blocker

- They are very useful in hypertensive patient with concomitant diseases, MI, angina and migraine headache

- They are contraindicated in heart failure, asthma, heart block, diabetes mellitus & in peripheral vascular disease

ACE inhibitors

- Captopril (capoten), Enalapril & Lisinopril**
- They block angiotensin converting enzyme (ACE) that converts angiotensin I into angiotensin II
- Angiotensin II is a potent vasoconstrictor & stimulates aldosterone production from adrenal cortex leading to Na & water retention
- Useful in hypertension particularly
- chronic** renal disease
- Left** ventricular hypertrophy

- Captopril** is given twice daily
- Enalapril** is prodrug is given once daily

Adverse effects:

- dry cough
- loss of taste sensation
- increase blood potassium
- stomatitis, abdominal pain
- They are contr-indicated during pregnancy

Nifedipine, Verapamil, Diltiazem & amlodipine

- Act by inhibiting influx of Ca (Ca channel blockers)

- This lead to decrease intracellular Ca & vascular smooth muscle relaxation & a direct -ve inotropic effect
- They are potent vasodilator of arterial side

- Direct action on heart (-ve chronotropic & inotropic effects) with **verapamil**

- They are safe in renal disease

- Adverse effects: headache, flushing, increase heart rate (**nifedipine**), decrease heart rate (**verapamil**) & ankle oedema

Angiotensin II receptor antagonists

Losartan & Candesartan

They are angiotensin II receptor blockers

They produce vasodilatation & block Aldosterone secretion

Given once daily in HTN particularly when patients on ACEI developed cough

They are also useful in Hypertensive patients with diabetes.

Losartan

- They produce vasodilatation & block aldosterone secretion

- Given once daily in HTN particularly when patients on ACEI develop cough

- It is also useful in heart failure

Ca Antagonists

Nitroprusside:

- A potent vasodilator of venous & arteriolar sides

- Its t 1/2 is few minutes, should be given by continuous IV infusion

- It is indicated in complicated hypertensive crisis (associated with LVF, encephalopathy & dissecting aneurysm)

- Adverse effects: excessive hypotension, sweating & palpitation

Hydralazine (Apresoline)

- Is a direct arterial vasodilator that reduces BP by reducing PVR

- Na & water retention may occur leading to oedema

- Tolerance to hypertensive effect may occur if it used alone

- It is used with beta-blockers & diuretics

- It is used in pregnancy-induced HTN

Minoxidil

- It is very potent vasodilator

- Should be used for treatment of severe HTN resistant to other drugs

- It causes Na & water retention

- It must be prescribed with a beta-blocker & a diuretic

- Adverse effects: hypertrichosis

