

ANTIHYPERTENSIVE DRUGS

Today we will have an introduction to anti-hypertensive drugs

Slide #1:

-Hypertension affecting approximately 15% of the USA population, and affecting about 50% of those who are over 50 years old

-hypertension also affecting about 50% of Jordanians who are over 45 years old, however the worrying issue recently is that hypertension is affecting young adults especially males and those that subjected to social stress and tension(like most of us 😊)at the end

Slide #3:

-the problem of hypertension is that it is affecting the patient with no any clear manifestations and silently leads the patient to develop (CHF/MI/renal damage/cerebrovascular accidents) so the doctor must speak to the patient to tell him about the catastrophic end results of hypertension and encourage him to adhere to the drug, meaning that the hypertensive patient must take his drug in the right time with the proper amount without any delay or stop, what so called DRUG ADHESION

-EXAMPLE:hypertensive case coming to you and you give him anti-hypertension drug, after a month he come back to you with moderate decrease in his hypertension but not matching what you expect from the drug to do, then ask him if he has additional drugs kit in his house if his answer was yes then you should suspect that he is not adherent to the drug for any reason(might be side effect like nightmares, fatigue or sexual impotency associated with some drugs)

Slide #4:

-pay attention of removing of stage 3 from old classification and combine it with stage in one category, which denote to the seriousness of hypertension above 160/100.

-take care about prehypertension in the new classification, they consider an increase in blood pressure above 120/80 and below 140/90 can lead to hypertension, unlike old classification.

-at the end,the target for you in hypertensive patient is to return his blood pressure back to the normal (optimal) range (120/80)

Slide #5:

Remember* DON'T CONSIDER A PILL FOR EVERY ILL

-life style can treat hypertension without the use of drugs or at least reduces the combination therapy

-Over 35% of Jordanian male adults become overweight after marriage

Slide #6:

- weight reduction can decrease systolic blood pressure up to 20 mmHg
- DASH=foods containing fibers (vegetables , apple)
- Dietary sodium reduction is also important in drug manufacture as certain drugs depend on it
- again, you can combine all of these lifestyle modification together without the use of drugs
- western scientists don't prevent totally alcohol consumption in their textbooks because of what so called social addiction although they know the risk of moderate consumption in blood pressure

Slide # 7 & 8 & 9:

- CNS = rapid, moment to moment regulation
- Kidney system = long-term regulation
- local factors such as Nitric Oxide (NO) and bradykinin,work on vessels

Slide #10:

- drugs that are used in treatment of hypertension
- reserpine causes depletion of catecholamine in the vessels(no catecholamine release from the vessels) so the sympathetic outflow is reduced so reduces blood pressure
- the blockade of some Beta1 receptors of the heart reduces the chronotropic (beats number) and inotropic (pumping force) reducing cardiac output
- Clonidine treats high blood pressure by stimulating α_2 -receptors in the brain, which decreases peripheral vascular resistance, lowering blood pressure(activation of the feedback inhibition mechanism of α_2 -receptors)
- the blockade of Alpha1 receptors of the vessels causes vasodilatation and lowering blood pressure
- Beta blockade also affects Beta receptor of juxtaglomerular cells that release renin and reduces its release
- angiotensin II is the most vasoconstrictor in our body
- aliskiren is contraindicated with many conditions like renal failure thats why its use is reduced (مش داخل)
(معاكم فقط للمعرفة)
- angiotensin receptor of vessels blockers(like losartan) prevent vasoconstriction as well as prevent aldosterone production(aldosterone causes water & sodium retention)
- drugs that works locally such as (((nitroprusside))) which increasesNitric oxides that vasodilatearteries and veins making it the drug of choice in hypertension emergencies. Hydralazine works on K⁺ entrance in

blood vessels. Ca⁺ channel blockers reduces contraction in either the heart or the vessels or both of them according to the drug used

Slide #11:

- monotherapy can be used in stage 1 hypertension
- polypharmacy: sometimes when you use combination of drugs in the treatment of hypertension in some old age patients, they will have drugs kit (علبة ماکونتوش) that's should be away from children
- dispensing pharmacology: two or more drugs with one tablet

Slide #12:

- first line therapy (drug that is given after diagnosis) of hypertension is either diuretics or Beta blockers because of their low adverse effects
- ACEI, Alpha1 blockers and Ca⁺ blockers can be used as first line therapy and monotherapy
- Alpha1 blockers common side effect is orthostatic hypotension which lead to edema and water sodium retention, Nevertheless it is the first line therapy in the treatment of prostatic hypertrophy in men who are also having hypertension.

Slide #13-24:

- always start with diuretics when you want to reduce the pressure 15-20 mmHg
- diuretics work on tubules of the kidney, for example thiazide works on distal tubule while others (Lasix) work on tubule of henle
- distal tubule is responsible for about 5% sodium reabsorption while tubule of henle is responsible for about 25% so the drugs that work on tubule of henle is stronger
- in hypertension, we don't strongly use loop diuretics because of its many side effects including (hypomagnesaemia, hypernatremia and hypocalcaemia and hyperurecemia).
- the mechanism of diuretics action is increasing urinary sodium and water excretion, while decreasing extracellular and plasma volume (this decrease in volume is thought to be the major cause of hypertension reduction), it also acutely reduce cardiac output and chronically decrease total peripheral resistance
- considering thiazide, when giving it to a hypertensive patient, his urine volume is increased while his blood volume is decreased for about 10 days. After these 10 days his urine and blood volumes return back to normal with slight decrease in blood volume, this decrease is the result of sodium depletion from arteries or smooth muscles that lead to decreased peripheral resistance (الريکورد مش واضح (one of the hypotheses explaining the slight decrease).
- side effect of thiazide is mild hypokalemia.

-hyperurecemia is the side effect of both thiazide and loop diuretics because both of them compete with the excretion site of uric acid causing the reabsorption of uric acid back to the body.

-hyperurecemia can lead to gout on the long run.