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Assignment Pharmacology

**ANTIHYPERTENSIVES**

: Antihypertensives are a class of drugs that are used to treat hypertension (high blood pressure).[1] Antihypertensive therapy seeks to prevent the complications of high blood pressure, such as stroke and myocardial infarction. Evidence suggests that reduction of the blood pressure by 5 mmHg can decrease the risk of stroke by 34%, of ischaemic heart disease by 21%, and reduce the likelihood of dementia, heart failure, and mortality from cardiovascular disease.[2] There are many classes of antihypertensives, which lower blood pressure by different means. Among the most important and most widely used medications are thiazide diuretics, calcium channel blockers, ACE inhibitors, angiotensin II receptor antagonists (ARBs), and beta blockers.

Which type of medication to use initially for hypertension has been the subject of several large studies and resulting national guidelines. The fundamental goal of treatment should be the prevention of the important endpoints of hypertension, such as heart attack, stroke and heart failure. Patient age, associated clinical conditions and end-organ damage also play a part in determining dosage and type of medication administered.[3] The several classes of antihypertensives differ in side effect profiles, ability to prevent endpoints, and cost. The choice of more expensive agents, where cheaper ones would be equally effective, may have negative impacts on national healthcare budgets.[4] As of 2018, the best available evidence favors low-dose thiazide diuretics as the first-line treatment of choice for high blood pressure when drugs are necessary.[5] Although clinical evidence shows calcium channel blockers and thiazide-type diuretics are preferred first-line treatments for most people (from both efficacy and cost points of view), an ACE inhibitor is recommended by NICE in the UK for those under 55 years old.[6]

Diuretics Edit

Hydrochlorothiazide, a popular thiazide diuretic

Diuretics help the kidneys eliminate excess salt and water from the body's tissues and blood.

Loop diuretics:

bumetanide

ethacrynic acid

furosemide

torsemide

Thiazide diuretics:

epitizide

hydrochlorothiazide and chlorothiazide

bendroflumethiazide

methyclothiazide

polythiazide

Thiazide-like diuretics:

indapamide

chlorthalidone

metalozone

Xipamide

Clopamide

Potassium-sparing diuretics:

amiloride

triamterene

spironolactone

eplerenone

In the United States, the JNC8 (Eighth Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure) recommends thiazide-type diuretics to be one of the first-line drug treatments for hypertension, either as monotherapy or in combination with calcium channel blockers, ACE inhibitors, or angiotensin II receptor antagonists.[7] There are fixed-dose combination drugs, such as ACE inhibitor and thiazide combinations. Despite thiazides being cheap and effective, they are not prescribed as often as some newer drugs. This is because they have been associated with increased risk of new-onset diabetes and as such are recommended for use in patients over 65 where the risk of new-onset diabetes is outweighed by the benefits of controlling systolic blood pressure.[8] Another theory is that they are off-patent and thus rarely promoted by the drug industry.[9]

Calcium channel blockers Edit

Calcium channel blockers block the entry of calcium into muscle cells in artery walls.

dihydropyridines:

amlodipine

cilnidipine

clevidipine

felodipine

isradipine

lercanidipine

levamlodipine

nicardipine

nifedipine

nimodipine

nisoldipine

nitrendipine

non-dihydropyridines:

diltiazem

verapamil

The 8th Joint National Committee (JNC-8) recommends calcium channel blockers to be a first-line treatment either as monotherapy or in combination with thiazide-type diuretics, ACE inhibitors, or angiotensin II receptor antagonists for all patients regardless of age or race.[7]

The ratio of CCBs' anti-proteinuria effect, non-dihydropyridine to dihydropyridine was 30 to -2.[10]

ACE inhibitors

Angiotensin II receptor antagonists

Adrenergic receptor antagonists

Vasodilators

Renin inhibitors

Aldosterone receptor antagonist

Alpha-2 adrenergic receptor agonists

Endothelium receptor blockers Edit

Bosentan belongs to a new class of drug and works by blocking endothelin receptors. It is specifically indicated only for the treatment of pulmonary artery hypertension in patients with moderate to severe heart failure.

**Medicines for congestive heart failure**

Beta blockers (carvedilol, metoprolol, bisoprilol)

ACE inhibitors (lisinopril, captopril)

Angiotensin receptor blockers (losartan)

Combination medicines (Entresto, or sacubitril/valsartan)

Aldosterone antagonist (spironolactone, eplerenone)

Digoxin (Lanoxin)