



SMART PHARMACOLOGY

LESSON 1

Task 1

Give a definition of the concept of «arterial hypertension». Explain the differences between essential and secondary (symptomatic) hypertension. What are the main causes, symptoms and complications of arterial hypertension? Discuss the medico-social significance of arterial hypertension.

Task 2

Discuss the main approaches to the treatment of arterial hypertension (life-style modifications and pharmacotherapy). Name the pharmacological groups of drugs of the first-line essential hypertension therapy.

Task 3

Give the classification of neurohormonal factors of the vascular tone regulation. To do this, refer the following factors to the appropriate group and fill in the table.

Neurohormonal factors of the vascular tone regulation

Vasoconstrictors	Vasodilators
<i>constrict vessels</i>	<i>dilate vessels</i>

Acetylcholine
Adrenaline
Angiotensin II
Bradykinin
Dopamine
Histamine
Nitrogen monoxide (NO)
Noradrenaline
Vasopressin (ADH)

Task 4

Give the classification of antihypertensive/hypotensive drugs. To do this, refer the following drugs to the appropriate group by the mechanism of action and fill in the table.

Classification	Drugs
Drugs decreasing the activity of sympathetic nervous system	
<i>Agonists of central α_2-adrenoreceptors</i>	
<i>Agonists of imidazoline receptors</i>	
<i>Sympatholytics</i>	
<i>Ganglionic blockers</i>	
<i>β-adrenoblockers (cardioselective)</i>	
<i>β-adrenoblockers (noncardioselective)</i>	
<i>α_1-adrenoblockers</i>	
<i>$\alpha + \beta$-adrenoblockers</i>	
Peripheral vasodilative drugs	
<i>Peripheral vasodilators</i>	
<i>Activators of potassium channels</i>	
<i>ACE inhibitors</i>	
<i>Angiotensin II receptors antagonists</i>	
<i>Blockers of calcium channels (calcium antagonists)</i>	
<i>Spasmolytics</i>	

Amlodipine	Losartane
Atenolol	Magnesium sulfate
Bendazole	Methyldopa
Bisoprolol	Minoxidil
Captopril	Moxonidine
Clonidine hydrochloride	Nifedipine
Diazoxide	Papaverine h/chl
Dilthiazem	Papazole
Doxazosine	Prazosine
Enalapril	Propranolol
Hexamethonium benzosulphonate	Reserpine
Hydralazine h/chl	Sodium nitroprusside
Isradipine	Valsartane
Labetalol	Verapamil
Lisinopril	

Task 5

Discuss the pharmacodynamics of drugs decreasing the activity of sympathetic nervous system and combine the pharmacological effects/side effects and indications/contraindications for this group of drugs.

Pharmacodynamics (effects)	Indications
Hypotensive effect	
Medicines have the hypotensive, as well as anti-anginal, anti-arrhythmic effect at the same time	
Side effects	Contraindications
Headache, dizziness, depression, orthostatic hypotension, bradycardia, dyspepsia	

Indications/Contraindications

Hypertension, hypertensive crisis
 Prevention and treatment of angina pectoris, tachyarrhythmia, hypertension (β -adrenoblockers)
 Atherosclerosis of the cerebral vessels, depression, severe heart failure, diseases of the GIT

The mechanism of action:

Task 6

Discuss the pharmacodynamics of peripheral vasodilative drugs and combine the pharmacological effects/side effects and indications/contraindications for this group of drugs.

Pharmacodynamics (effects)	Indications
Hypotensive effect (all drugs decrease BP and TPVR, dilate arteries)	
Decrease of post-load and/or pre-load to the heart	
Spasmolytic effect (myotropic spasmolytics)	
Moderate immune-stimulating effect	
Side effects	Contraindications
Headache and hypotension up to collapse; HF	

Indications/Contraindications

Hypertension and hypertensive crisis
 Hypertension in combination with angina pectoris (calcium antagonists). Chronic HF (inhibitors of ACE, antagonists of angiotensin II receptors)
 Spasms of the smooth muscles of the internal organs
 Spasms of the smooth muscles of the internal organs
 Decrease of immunity (Bendazol)

The mechanism of action:

Task 7

Name the main groups of diuretics which are used in cardiology. Discuss their pharmacological effects/side effects and indications/contraindications for this group of drugs.

Thiazide	
Loop	
Potassium-sparing	

- Amiloride
- Bumetanide
- Clopamide
- Ethacrynic acid
- Furosemide
- Hydrochlorothiazide
- Indapamide
- Spirolactone

Pharmacological effects: _____

Indications: _____

Side effects: _____

Task 8

Discuss advantages and disadvantages of combined drugs used in complex therapy of arterial hypertension. Give the examples of the combinations and name the drugs.

Combination of drugs	Examples	Advantages
β -adrenoblocker + Ca antagonist	metoprolol+phelodipine	
β -adrenoblocker + thiazide-like diuretic	atenolol+chlorthalidone	
ACE inhibitor + thiazide diuretic	captopril+hydrochlorothiazide	
ACE inhibitor + Ca antagonist	trandolapril+verapamil	
Antagonist of AII receptors + thiazide diuretic	losartan+hydrochlorothiazide	
Thiazide diuretic + potassium-sparing diuretic	hydrochlorothiazide+triamtren	

Task 9

Explain the difference between the terms «antihypertensive drugs» and «hypotensive drugs». Indicate the clinical meaning of this terminology.

Task 10

Indicate which pharmacological groups of drugs are used for the routine therapy of arterial hypertension, which – in the case of emergency care. Explain which pharmacokinetic features of drugs are taken into account in each of these situations?