D.PHARM • SECOND YEAR

फार्माकोलॉजी

अध्याय 5

हृदयवाहिका तंत्र पर कार्य करने वाली औषधियाँ



हिंदी अध्याय नोट्स

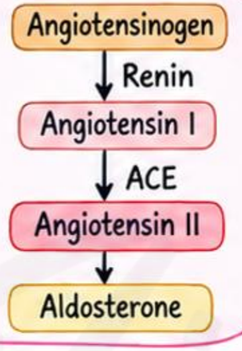
DIPLOMA IN PHARMACY

ANTIHYPERTENSIVE DRUGS: CLASSIFICATION

Antihypertensive drugs बढ़े हुए arterial blood pressure को कम करती हैं और stroke, myocardial infarction, renal failure तथा heart failure से बचाव में मदद करती हैं।

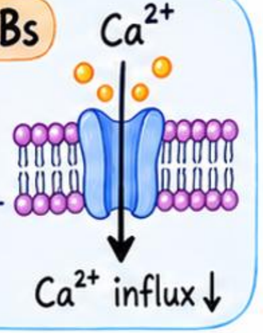
A. RAAS-BLOCKING DRUGS

- ACE inhibitors: enalapril, lisinopril
- ARBs: losartan, telmisartan
- direct renin inhibitor: aliskiren
- aldosterone antagonists: spironolactone, eplerenone



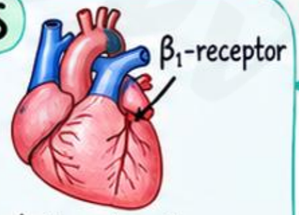
B. CALCIUM CHANNEL BLOCKERS, CCBs

- dihydropyridines: amlodipine, nifedipine — मुख्यत: vascular
- non-dihydropyridines: verapamil, diltiazem — cardiac plus vascular



C. BETA-ADRENERGIC BLOCKERS

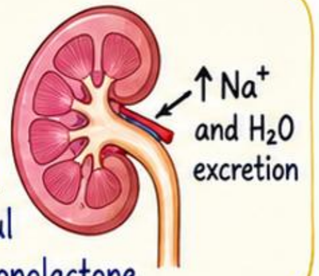
- non-selective: propranolol
- β_1-selective: atenolol, metoprolol
- α-blocking action वाले: labetalol, carvedilol





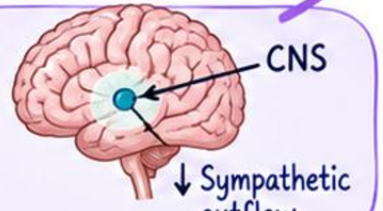
D. DIURETICS

- thiazide या thiazide-like: hydrochlorothiazide, chlorthalidone
- loop: furosemide — edema, advanced CKD या resistant hypertension में useful
- potassium-sparing: amiloride, spironolactone



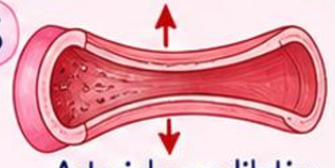
E. CENTRALLY ACTING DRUGS

α_2-agonists: clonidine, methyldopa।



F. DIRECT VASODILATORS

Hydralazine, minoxidil।



MEMORY LINE: BP को volume, cardiac output, vascular resistance या RAAS activity घटाकर control किया जाता है।

ANTIHYPERTENSIVE ACTIONS AND DOSE EXAMPLES

ACE inhibitors या ARBs:
- ↓ angiotensin II action → vasodilation + ↓ aldosterone → Na^+ और water retention कम

beta-blockers:
- ↓ heart rate + ↓ contractility + ↓ renin release → ↓ cardiac output

CCBs:
- L-type Ca^{2+} channels block → arterial vasodilation; verapamil और diltiazem heart rate तथा contractility भी घटाती हैं

BP = cardiac output × systemic vascular resistance

circulating volume

diuretics:
- पहले ↓ plasma volume; long-term में ↓ peripheral resistance

central α_2-agonists:
- CNS से sympathetic outflow कम

direct vasodilators:
- arterial smooth muscle relax → ↓ systemic vascular resistance

DOSE EXAMPLES

amlodipine: 5 – 10 mg once daily

losartan: 50 – 100 mg/day oral

enalapril: 5 – 20 mg/day oral

metoprolol: 25 – 100 mg twice daily oral

hydrochlorothiazide: 12.5 – 25 mg/day oral

clonidine: 0.1 – 0.3 mg twice daily oral

PRACTICAL RULE

Patient के अनुसार therapy start करें; BP, renal function और electrolytes reassess करके titrate करें। अलग control points पर action के कारण combination therapy अक्सर आवश्यक होती हैं।

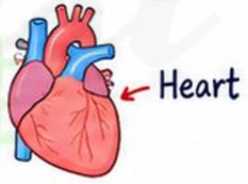
ANTIHYPERTENSIVE USES AND SAFETY

मुख्य उपयोग (Indications)

1. primary या essential hypertension
2. secondary hypertension, जैसे renal disease
3. hypertensive emergency: monitored IV treatment जैसे labetalol या nitroprusside, और BP को controlled तरीके से घटाना



4. heart failure या myocardial infarction के बाद: selected ACE inhibitors और beta-blockers



5. albuminuria या proteinuria वाली CKD: suitable होने पर ACE inhibitor या ARB



EMERGENCY NOTE

बहुत high BP के साथ chest pain, neurological deficit, pulmonary edema या organ injury में urgent hospital assessment चाहिए।

मुख्य सावधानियाँ या निषेध (Major Cautions or Contraindications)

- **ACE inhibitors:** pregnancy, bilateral renal-artery stenosis, previous ACE-inhibitor angioedema; creatinine और K^+ monitor करें
- **ARBs:** pregnancy में avoid; renal function और K^+ monitor करें
- **beta-blockers:** bradycardia, AV block; non-selective agents asthma worsen कर सकती हैं
- **verapamil या diltiazem:** AV block, marked bradycardia और HFrEF
- **thiazides:** gout, hyponatraemia और hypokalaaemia risk
- **spironolactone:** hyperkalaemia और renal impairment risk

महत्वपूर्ण प्रतिकूल प्रभाव (Important Adverse Effects)

- **ACE inhibitors:** dry cough, hyperkalaemia, angioedema
- **amlodipine:** ankle edema, flushing, headache
- **hydralazine:** reflex tachycardia और lupus-like syndrome
- **minoxidil:** edema, tachycardia और hypertrichosis

CLONIDINE अचानक STOP न करें

Sudden withdrawal से severe rebound hypertension हो सकता है। Supervision में taper करें।



ANTI-ANGINAL DRUGS: CLASSIFICATION

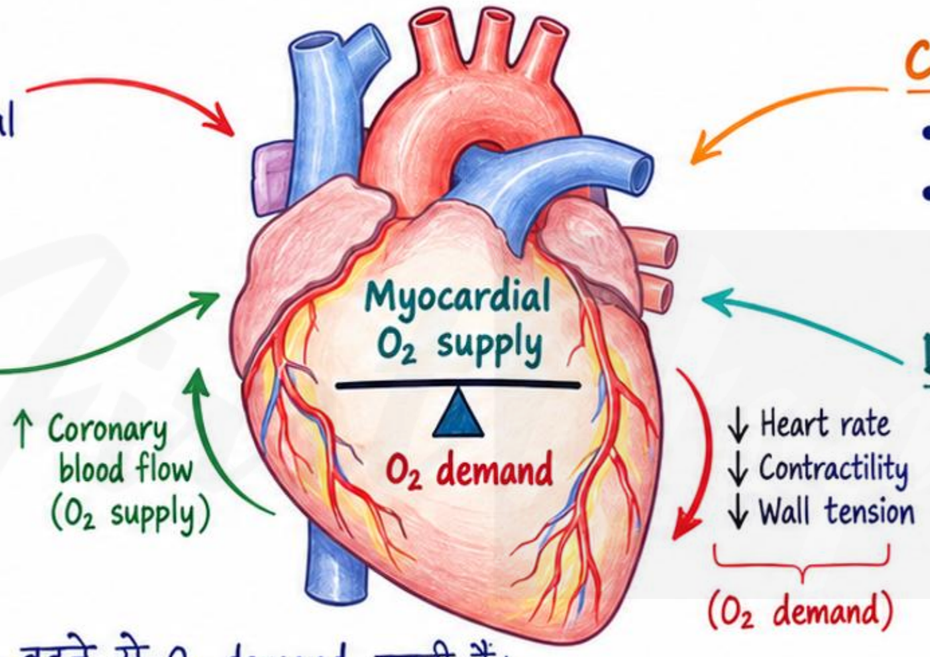
Anti-anginal drugs myocardial ischemia से होने वाले angina pectoris को prevent या relieve करती हैं। ये myocardial O_2 demand घटाकर, coronary O_2 supply बढ़ाकर, या दोनों तरीकों से act करती हैं।

A. NITRATES

- short acting: nitroglycerin, sublingual
- long acting: isosorbide dinitrate, isosorbide mononitrate

B. BETA-ADRENERGIC BLOCKERS

Atenolol, metoprolol, propranolol।



C. CALCIUM CHANNEL BLOCKERS, CCBs

- dihydropyridines: amlodipine, nifedipine
- non-DHPs: verapamil, diltiazem

D. OTHER ANTI-ANGINAL AGENTS

- late Na^+-current inhibitor: ranolazine
- metabolic modulator: trimetazidine
- nitrate plus K_{ATP}-channel opener: nicorandil

O_2 BALANCE

Heart rate, contractility और wall tension बढ़ने से O_2 demand बढ़ती हैं।
Therapy demand घटाती या coronary blood flow बढ़ाती हैं।

CLINICAL PATTERNS

1. **stable exertional angina:** beta-blocker, CCB, nitrate या suitable anti-anginal

2. **acute coronary syndrome या unstable angina:** anti-anginal relief केवल एक part है; urgent antiplatelet, anticoagulant और reperfusion assessment की आवश्यकता हो सकती है

3. **vasospastic या Prinzmetal angina:** CCBs और nitrates preferred हैं

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