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The Presentation
On
Subject name : Pharmacology II,
Subject Code: BP 503T
Unit I, Chapter-4: Angina pectoris
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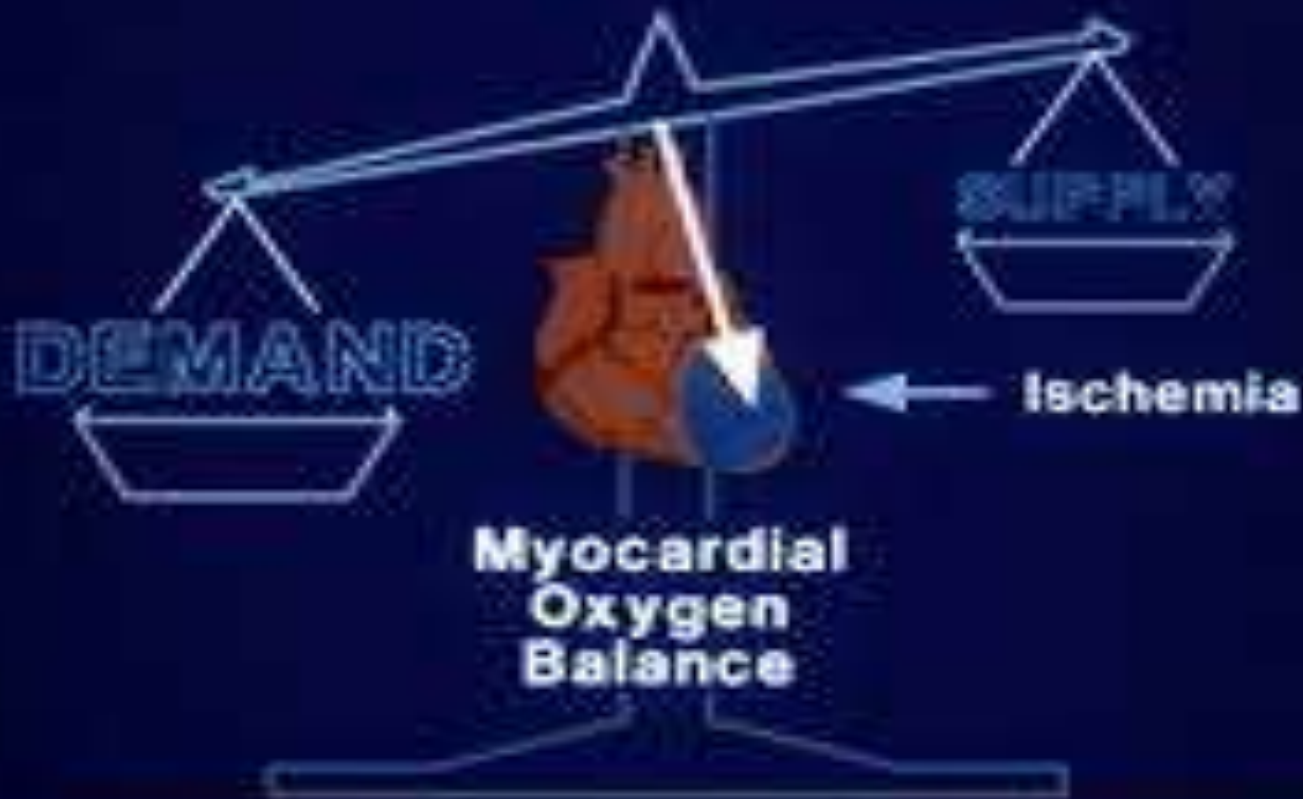
Angina pectoris

Disease affecting the coronary arteries which supply oxygenated blood from left ventricle to heart tissues

The lumen of artery become restricted and it becomes less efficient in supplying the blood and oxygen to heart called as ischemia

Definition of Angina

ANGINA PECTORIS IS A CONSEQUENCE
OF MYOCARDIAL OXYGEN DEMAND
EXCEEDING MYOCARDIAL OXYGEN SUPPLY



GOALS OF TREATMENT

- Therapy of angina is mainly directed to minimize the Anginal attacks
- By restoring the balance between oxygen supply/oxygen demand to cardiac muscles or dilating coronary vessels
- Reversing and preventing myocardial ischemia

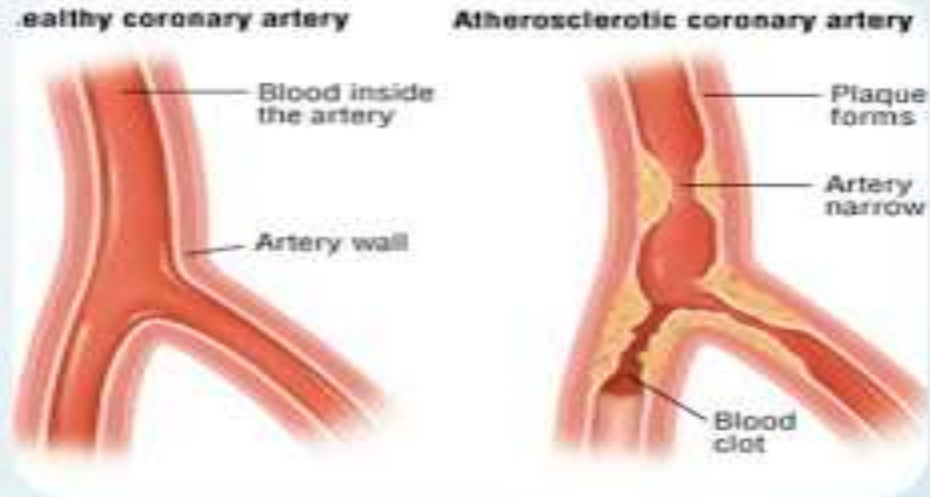
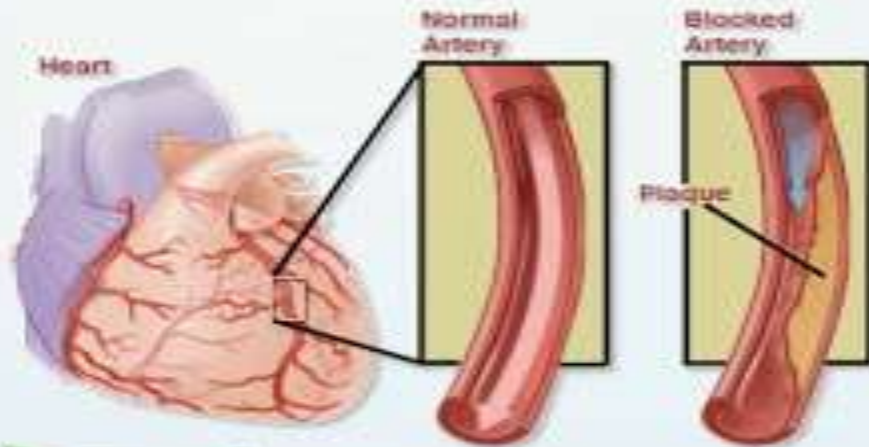
SUPPLY AND DEMAND.

- Improve the quality of life.

TYPES OF ANGINA

- Stable or classical
- Unstable angina or acute coronary syndrome
- Prinzmetal or variant angina

Angina Types



What anti-anginal drugs do ?

- Decrease the demand of oxygen or increase the supply of oxygen
- Dilates coronary arteries
- Decrease the after load

CLASSIFICATION

1) NITRATES:

- a) Short acting: Glyceryl trinitrate (GTN)
- b) Long acting: Isosorbide dinitrate, Isosorbide mononitrate, Erythrityl tetranitrate, Pentaerythrityl tetranitrate

2) Beta blockers: Metoprolol, Atenolol, Bisoprolol, Celiprolol

3) Calcium Channel Blockers:

- a) Verapamil, Diltiazem
- b) Dihydropyridine ---Nifedipine, Amlodipine, Nitrendipine, Nimodipine

4) Potassium Channel opener:

Nicorandil, Pinacidil, Cromakalim, Minoxidil, Diazoxide

5) Cytoprotective drugs:

Trimetazidine, Ranolazine.

Organic Nitrates

- They act directly on all the smooth muscle of the body & relax them.
- Nitrates release nitric oxide which is a powerful muscle relaxants.
- Most predominant in the vascular smooth muscles (i.e walls of arteries & veins).

Action of nitrates

- Effects on other smooth muscles
- Redistribution of coronary flow
- After load reduction
- Preload reduction

Preload reduction

Nitroglycerin relaxes vascular smooth muscle and dilates both arterial and venous vessels.



Dilation of veins is more predominant than dilation of arteries, resulting in peripheral pooling of blood & decreased venous return.



Decreased preload

Afterload reduction

Nitrates also produce some arteriolar dilatation



Decrease peripheral resistance



Reduction of afterload

Redistribution of coronary flow

Dilatation of coronary arteries



Increase blood supply to the myocardium

Therapeutic uses of anti-anginal drugs

Nitrates:-

- Angina pectoris
- MI
- Congestive cardiac failure
- Biliary colic
- Cyanide poisoning
- Oesophageal spasm

SIDE EFFECTS

- Headache
- Flushing
- hypotension
- Dizziness

CONTRAINDICATION

- Hypersensitivity
- Severe anaemia
- Increased Intracranial Pressure
- Cerebral haemorrhage

Isosorbide

1. Isosorbide mononitrate

2. Isosorbide dinitrate

- It is a nitrate
- Like nitroglycerin, and is used for treating and preventing angina.
- Is given Sublingual or Per Oral .
- SL Isosorbide has a slower onset and a longer duration of action compared to SL nitroglycerin .
- Because SL isosorbide does NOT relieve chest pain as rapidly as nitroglycerin, Isosorbide is limited to treating acute angina in patients intolerant or unresponsive to SL nitroglycerin .

CALCIUM CHANNEL BLOCKER:

Block the entry of Ca^{++} ions into the smooth & cardiac muscles



Decreased intracellular Ca^{++} & causes smooth muscles relaxation



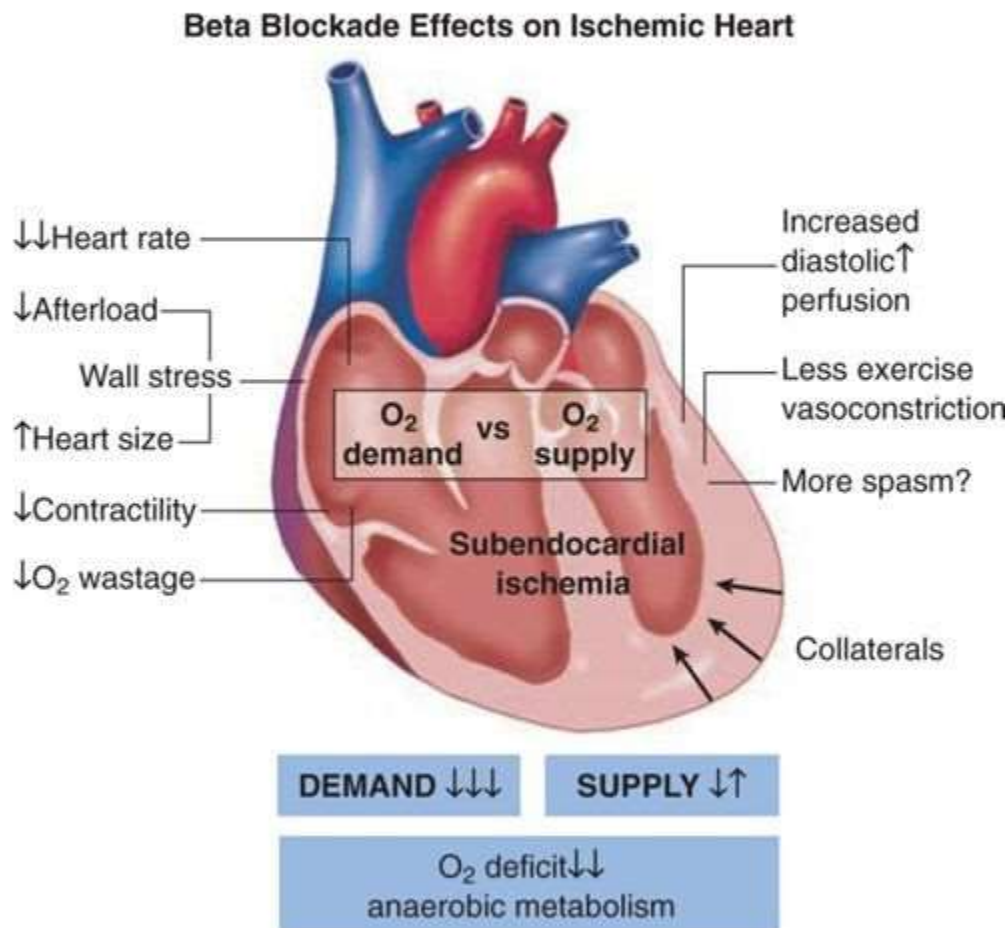
vasodilation

ADVERSE EFFECTS

- Nausea
- Vomitting
- Bradycardia
- Ankle edema

Beta Blockers

- Beta receptors
 - B1: increase HR, contractility, AV conduction
 - cardioselective
 - B2: vasodilation and bronchodilation
 - B3: catecholamine induced thermogenesis
- Reduction in myocardial oxygen demand
 - Heart rate, contractility and wall stress
- Improved mortality
 - Prior MI or heart failure



BETA BLOCKERS

DECREASE CORONARY SUPPLY



DECREASE THE HEART RATE BY BLOCKING BETA RECEPTOR



DECREASE THE WORK OF HEART



DECREASE O₂ CONSUMPTION



INCREASE REDISTRIBUTION OF BLOOD

DRUGS

Mainly two drugs used

- Atenolol
- Metoprolol

ADVERSE EFFECT

Hypotension

Depression

Bradycardia

Heart block

CHF

CONTRAINDICATION OF BETA BLOCKERS

Heart block

Pulmonary edema

Cardiogenic shock

MOA of potassium channel openers

Potassium channel openers



Open K_{ATP}



Enhance K^+ efflux



Membrane Hyperpolarization



↓ Ca^{2+} entry



Reduced intracellular calcium



Smooth muscle relaxation

DRUG USED

Nicorandil

ADVRSE EFFECT

- Flushing
- Palpitation
- Weakness
- Dizziness
- Nausea
- Vomiting

**Thank
You**

