ANTI-ADRENERGIC DRUGS

(Sympatholytics)

- Antagonize the actions of Adrenaline & related drugs
- α & β- blockers

α-Blockers

Non-Equilibrium type (Non-competitive) (Irreversible)

- Phenoxybenzamine (β-haloalkylamine)

Equilibrium type (competitive antagonist) (Reversible)

Non-selective Blockers

- Imidazoline
  - (Phentolamine)
- Ergot alkaloids
  - Ergotamine
  - Ergotoxine
- Hydrogenated ergot alkaloids
  - Dihydroergotamine
  - Dihydroergotoxine (codergocrine)
- Miscellaneous
  - Chlorpromazine

α_1-Selective Blockers

- Prazosin
- Terazosin
- Doxazosin
- Alfuzosin
- Tamsulosin
- Silodosin

α_1-Blockers:

causes Impaired ejaculation & impotence on Vas deference.

α_{1A} - In Benign Prosthetic Hyperplasia (BPH) Resistance to flow of urine.

α_2-Selective

- Yohimbine

In Eye → Causes Mydriasis

GIT → P :: Diarrhoea

→ α_2 Blockers causes ↑ in N.A.
→ Tachycardia Palpitation (Reflex Tachycardia)

Arteries (α_1) → Blockers cause Peripheral resistance.
Decrease in after load BP.

Veins (α_1) → Venodilation
↓ in preload

→ Nasal stuffiness in nasal b.v

→ Intestinal motility is ↑ due to partial inhibition of relaxant sympathetic — influences loose motion

→ Hypotension produced by α-blockers can reduce renal blood flow due to GFR is ↓.

Phentolamine:

- Treatment of erectile dysfunction,
- Withdrawal hypertension with clonidine & methyldopa.
- cheese reaction.

Phenoxybenzamine

- Trtmnt of hypertension c pheochromocytoma.

Tolazoline: Vasodilation in Angiography.
Raynaud's phenomenon

α_1 - Blockers

Vasodilation due to α_1 b α_1 d. & Prosthetic Urethra dilation (α_{1a})

Prazosin
Terazosin
Doxazosin
> Hypertension associated with dyslipidemia.

- contains Quinazoline ring, Piperazine ring (furan) acyl moiety.

α_2 - Blockers

- Yohimbine — In Erectile dysfunction,
- Corynanthine (α_1-selective) diabetic neuropathy
- Postural hypotensive.

diff is carbomethoxy group.

Use of α-Blockers

- In pheochromocytoma - Metyrosine is used
- Hypertensive emergies - Phentolamine
- Peripheral Vascular disease - Buerger's disease
- Migraine
- BPH - Prazosin.
- CHF
- 2° shock
- Male sexual dysfunction - Phentolamine.

* β-Blockers

β-Blockers

1st Generation (Non-selective β-blockers)
- Propranolol (30% BA)
- Timolol (Morpholine ring)
- Nadolol
- Pindolol (100% BA)
- Sotalol
- Levobunolol

(PPTNSL)

2nd Generation (Cardian β-blockers) (selective β-Blockers) (β_1-antagonists)
- Atenolol (β-cardi)
- Acebutolol (meta bolized) Diacetolol
- Bisprolol (most)
- Esmolol (shortest)
- Metoprolol

(EMBA)

3rd Generation β-blockers + Additional Vaso-dilatory Property

Non-selective (Phenylethanolamine)
- Labetalol (30% BA)
- Carvedilol (max plasma binding)
- Carteolol

α & β-blockers

α- Produce vasodilation
β- Reflex Tachycardia

(α-isomers)

β_1-Selective (longest)
- Betaxolol
- Celiprolol (min plasma protein binding)

Adv of Cardio-Selective β-blockers:
- Safe in asthma, diabetes,
less risk of hyperlipidemia.

Uses of β-blockers
- Hypertension
- Angina Pectoris
- MI
- Cardiac Arrhythmia
- CHF
- Pheochromocytoma
- Thyrotoxicosis
- Migraine
- Glaucoma
- Anxiety

Hyperthyroidism
Alcohol withdrawal

3rd Generation β Blockers

α-blockers: Labetolol (Non-selective)
Carvedilol "
Medroxolol
Bucindolol.

Release of NO :- Nebivolol (d-isomer)
Nipradilol

- S – Both β & α
- R – only α
- Has Antioxidant, Antiproliferant
→ ↓ systolic & diastolic B.P

K^+ ch Opener :- Tilisolol.

Ca^{+2} ch blocker (CBB) – Carvedilol
– Bevantolol
– Betaxolol.

β_2-agonist (CCB): Celiprolol
Carteolol
Bopindolol

β-blockers c̄ membrane stabilizing activity. (PMLAP)

Propranolol (max)
Metaprolol
Labetolol
Acebutolol
Pindolol.

} Possess Memb stabilizing Local Anaesthetic Property

Propranolol
- Amine group is protonated & binds by ionic interactions to the binding site
- Alcohol group interacts by hydrogen bonding

C.I of Non-Selective β-blocker –

ABCD – Asthma
Block
CHF
Diabetes

β-blocker c intrinsic Sympathomimetic activity (ISA)

Certain – Celiprolol, Oxprenolol
Partial – Pindolol, Penbutolol
agonist – Alprenolol
Activity – Acebutolol

High lipid solubility – Propranolol
Penbutalol

High Water solubility – (BEAST)

- Bisoprolol
- Esmolol
- Acebutolol, Atenolol
- Sotalol
- Timolol

longest acting – Nadolol (Non-selective)
Shortest acting – Esmolol. Selective – Betaxolol

100% bioavailability – Penbutolol
Pindolol.

30% bioavailability – Propranolol,
Carvedilol.

Max plasma protein binding – Carvedilol
Min " " " – celiprolol

→ Propranolol – Not in patients c Asthma.
→ Direct effect of Dobutamine is blocked by Metaprolol.
→ Atenolol – Not in Renal failure patients
least lipid soluble.