UNIT-VIII

Genitourinary System

The term "genitourinary" actually refers to two different systems. Urinary refers to the system responsible for removal waste products of metabolism from the bloodstream. Genito refers to the genital organs and the reproductive system.

Diuretics

Uterine Muscles Relaxant
Beta-2 Agonist
➔Ritodrine

Uterine Muscles Contractants
➔**Misoprostol** (see in autacoids)
➔**Oxytocin**
Ergot Alkaloid
➔Ergotamine

Available Brands in the Market

Yutopar Inj. (Ritodrine)
S.T Mom Tab. (Misoprostol)
Oxytocin Inj (Oxytocin)
Cafergot Tab. (Ergotamine)

Diuretics

A drug that increases the volume of urine produced by promoting the excretion of salts and water form the kidney.
Diuretics can be used as first-line drug therapy for hypertension. Low-dose diuretic therapy is safe, inexpensive, and effective in preventing stroke, myocardial infarction, and congestive heart failure. Recent data suggest that diuretics are superior to β-blockers for treating hypertension in older adults.

Prototype Diuretics Drugs

Depending upon the site of action, diuretics can be classified as…

Thiazide Diuretic
➔Chlorothiazide

Loop Diuretic
➔Bumetanide
➔ Furosemide

Potassium Sparing Diuretic
➔Spironolactone

Carbonic Anhydrase Inhibitor
➔Acetazolamide

Osmotic Diuretic
➔Mannitol

Available Brands in the Market

Xurin-k (Bumetanide)
Spiromide (Spironolactone)
Aldactone (Spironolactone)
Acetofen (Acetazolamide)
Acetopril ((Acetazolamide)
Osmotol (Mannitol)
Medisol (Mannitol)

Chlorothiazide (Thiazide Diuretic)

Mechanism Of Action
They inhibit Na+ reabsorption in distal convoluted tubule decreased Na+ reabsorption increase the concentration of urine.

Therapeutic Uses
These agents are important in the treatment of hypertension, congestive heart failure and hypercalciuria.

Adverse Effects
Most of the adverse effects involved problems in fluid and electrolyte balance.

Pharmacokinetics
These drugs are effective orally half-life is 40 hours these drugs secreted by urine.

Bumetanide (Loop Diuretic)

Mechanism Of Action
These agents inhibit Na, K, Cl contrasport in the ascending limb of loop of Henley.

Therapeutic Uses
The loop diuretics are the drugs of choice for reducing the acute pulmonary edema of heart failure. The drug is useful in emergency situation.

Pharmacokinetics
Loop diuretics are administered orally or parenterally. They are secreted into the urine.

Adverse Effects
Hypotension, Hypokalemia, Hypomagnesaemia,Ototoxicity

Spironolactone (Potassium Sparing Diuretic)

Mechanism Of Action
Spironolactone antagonizes aldosterone at intracellular cytoplasmic receptor sites result in inhibit mediator protein that stimulate the Na/K exchange in collecting tubule. This prevents the Na reabsorption and therefore K and H secretion.

Therapeutic Uses
These agents are used as diuretics with an additional advantage that is retention of K.

Adverse Effects
Gastric upset, peptic ulcer, Hypokalemia, nausea, confusion

Pharmacokinetics
Spironolactone is completely absorbed orally and strongly bound to protein.

Acetazolamide (Carbonic Anhydrase Inhibitor)

Mechanism Of Action
Acetazolamide inhibits carbonic anhydrase located intra-cellularly and on proximal tubular epithelium, results in increased urine volume.

Therapeutic Uses
The most common use of acetazolamide is to reduce elevate intraocular pressure of open angle glaucoma. Less commonly, acetazolamide can be used in the prophylaxis of acute mountain sickness.

Pharmacokinetics
It is given orally. It is secreted by the proximal tubule.

Adverse Effects
Potassium depletion, renal stone formation

Mannitol (Osmotic Diuretic)
Osmotic diuretics are used to affect increased water excreted rather than Na excretion. They are not useful for treating conditions in which Na retention occurs. They are used to maintain urine flow. Mannitol is not absorbed when given orally and should only be given intravenously. Adverse effects include dehydration

Ritodrine (Beta-2 Agonist, Uterine Muscles Relaxant)

Mechamism of Action
Ritodrine is a selective beta-2 receptor agonist that developed specifically for use as a uterine relaxant.

Therapeutic Uses
Ritodrine used for smooth muscle (uterine muscle) relaxant to decrease uterine activity and delay uncomplicated premature labor.

Side Effects
Fast heart rate, headache, nervousness, anxiety, nausea and vomiting

Oxytocin (Uterine Muscles Contractants)

Mechamism of Action
Oxytocin increase in intracellular calcium levels thus stimulates rhythmic contractions of the uterus.

Therapeutic Uses
Oxytocin use as a smooth muscle (uterine muscle) contractant.

Side Effects
Allergic reaction,nausea, vomiting, swelling of the mouth, face, lips, or tongue

Ergotamine (Ergot Alkaloid, Uterine Muscles Contractants)

Mechanism of Action
Ergotamine constricts smooth muscles like blood vessels and uterine muscles.

Therapeutic Uses
Ergotamine constricts uterine muscles. Ergotamine is also used to treat headache pain and other symptoms associated with migraines.

Side Effects
Allergic reaction, nausea, vomiting, swelling of the mouth, face, lips, or tongue