Chapter-9
Pharmacology & Toxicology

D.Pharma 2nd Year Notes

Chapter- 9

Drugs Acting on the Kidney

Definition, classification, pharmacological actions, dose, indications, and contraindications of

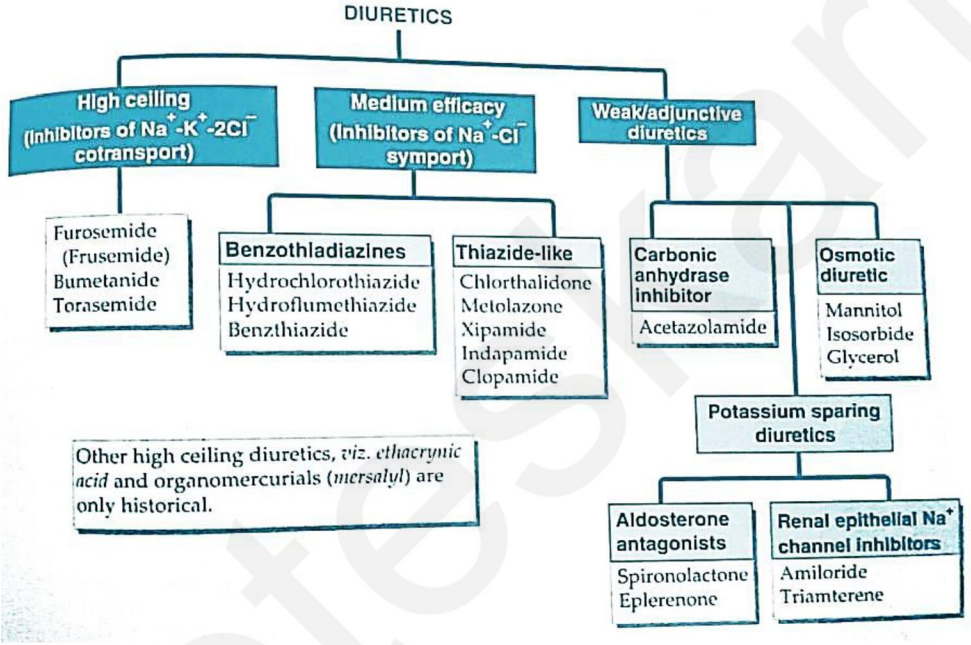
- **Diuretics**
- **Anti-Diuretics**

Video Class Dekhne Ke Liye QR scan Kare

1. Diuretic:

- Diuretics are drugs which cause a net loss of Na^+ and water in urine.
- Diabetics is given regularly balance is soon restore by compost station hemostatic mechanism of the body albeit with a certain in extracellular fluid volume.
- Diuretics are the most prescribed drugs.

Classification of Diuretic:



Pharmacological actions Diuretic:

- The act by diminishing sodium reabsorption at different sites in the nephron, thereby increasing urinary sodium and water losses.
- Diuretics drugs increase urine output by the kidney.

Furosemide

- Furosemide is a loop diabetic medication used to treat fluid build up due to the heart failure kidney disease liver scarring.
- It can be taken by injection into vein or by mouth.

Dose:

- 20-80mg once daily in the morning.
- In renal effect 200 mg hourly has been given by I.V./I.V. route.

Indications:

- Volume overload and edema
- Congestive heart failure exacerbation,
- Liver failure
- Renal failure
- Nephrotic syndrome.

Contraindications

- Use of a higher than the recommended dose of furosemide or a fast infusion rate of the drug,
- Hypoalbuminemia comorbid illnesses.
- The concomitant use of ethacrynic acid, aminoglycosides, or other ototoxic drugs.
- Patients with underlying severe renal impairment.

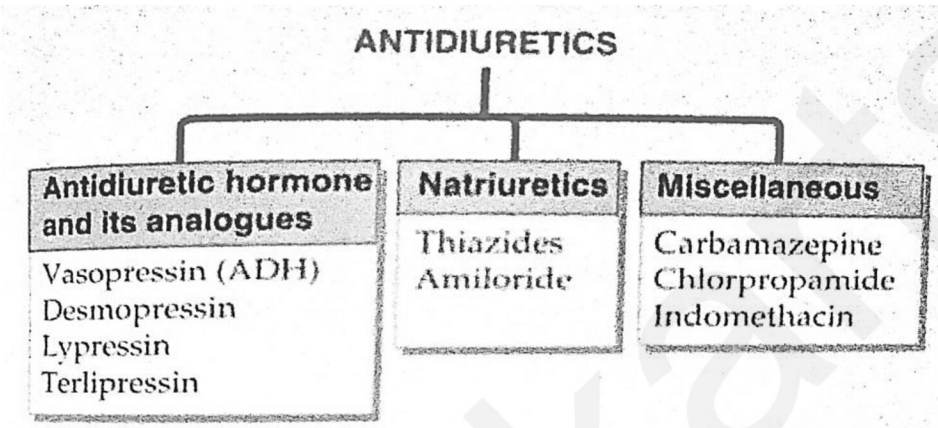
Isko Scan Karke Pharmacology Ke Complete Video Dek sakte hai

(आसान भाषा में)

2. Antidiuretics drugs

- Antidiuretics inhibit water excretion without affecting salt extraction.
- The drug that reduces urine volume particularly in diabetes insipidus (DI) which is their indication.

Classification of Antidiuretics drugs:



Desmopressin:

- Desmopressin is also used to control excessive thirst and the passage of an abnormally large amount of urine that may occur after a head injury or after certain types of surgery.
- Desmopressin is a man-made form of vasopressin and is used to replace a low level of vasopressin.

Pharmacological Action:

- Desmopressin Upon binding of desmopressin to V2 receptors in the basolateral membrane of the cells of the distal tubule and collecting ducts of the nephron, adenylyl cyclase is stimulated.
- The resulting intracellular cascades in the collecting duct lead to increased rate of insertion of water channels, called aquaporins, into the lumenal membrane and enhanced the permeability of the membrane to water.

Dose:

- Adults 10-40 µg/day in 2-3 divided doses.
- Children (for bed wetting) 5-10 µg at bed time.

- Oral0.1-0.2 mg TDS.
- Parenteral (S.C. or I.V.) 2-4 µg/day in 2-3 divided doses.

Indications:

- Treatment of polyuric
- Primary nocturnal enuresis,
- Nocturia,
- Diabetes insipidus.
- Hemophilia
- Von Willebrand's Disease (Type I)

Contraindications:

- Renal Disease & Cardiac insufficiency.
- Hyponatremia
- Contraindicated in individuals with known hypersensitivity to desmopressin acetate or to any of the components.

Vasopressin:

Vasopressin (also known as antidiuretic hormone or ADH) is a nonapeptide hormone produced primarily in the hypothalamus. It plays various roles related to diuresis, hemodynamics, and behavior.

Pharmacological Action:

- Increases blood pressure by inducing vasoconstriction.
- Enhances renal fluid reuptake via V1 and V2 cellular receptors.

Indication:

- Used to increase blood pressure in adults with vasodilatory shock refractory to fluids and catecholamines.

Contraindication:

- Hypersensitivity to vasopressin.
- Vascular disease, especially coronary artery disease.
- Chronic nephritis (until reasonable blood-nitrogen concentration is attained).

Thiazides (e.g., hydrochlorothiazide):

- Thiazides are diuretic medications that inhibit sodium reabsorption in the distal convoluted tubules of the kidneys.

Pharmacological Action:

- Increases urine output.
- Decreases blood volume.

Indication:

- Hypertension.
- Edema associated with heart failure, renal dysfunction, or liver disease.

Contraindication:

- Hypersensitivity to thiazides.
- Severe renal impairment.
- Anuria (lack of urine production).

Chlorpropamide:

- Chlorpropamide is an oral antidiabetic medication.

Pharmacological Action:

- Stimulates insulin release from pancreatic beta cells.
- Increases peripheral tissue sensitivity to insulin.

Indication:

- Used to treat type 2 diabetes.

Contraindication:

- Hypersensitivity to chlorpropamide.
- Severe renal or hepatic impairment.
- Diabetic ketoacidosis.