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Pharmacology
Chapter 9 : Drugs Acting on Kidney

Topics	Page No
Drugs Acting on Kidney	3
Definition, classification, pharmacological actions, dose, indications, and contraindications of	3
▪ Diuretics	3
▪ Anti-Diuretics	4

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Chapter 9
Drugs Acting on Kidney
Diuretics

- → Drugs promoting urine output are known as diuretic drugs.
- → They act directly on the kidneys and primarily increase the excretion of water and ions (sodium (Na), chloride (er) or bicarbonates (HCO;)] from the body.
- → Diuretics are also used for treatment of cardiac oedema (accumulation of fluid in extra vascular tissues).
- → It is also employed in the treatment of various disorders like nephrotic syndrome, diabetes insipidus, hypertension, nutritional oedema, oedema of pregnancy, and cirrhosis of liver.
- → They also decrease the intracellular and cerebrospinal fluid pressure.

Classification

1. **High Efficacy Diuretics (Inhibitors of Na -K- 2CI Co-transport)**
    - **Sulphamoyl Derivatives :** Furosemide, Bumetanide.
    - **Phenoxyacetic Acid Derivatives :** Ethacrynic acid.
    - **Organomercurials :** Mersalyl.
2. **Medium Efficacy Diuretics (Inhibitors of Na- CI Symporter)**
    - **Benzothiadiazines (Thiazides) :** Chlorothiazide, Hydrochlorothiazide, Benzthiazide, Hydroflumethiazide, Clopamide.
    - **Thiazide like Diuretics (Related Heterocyclics) :** Chlorthalidone Metolazone, Xipamide. Indapamide.
3. **Weak or Adjunctive Diuretics**
    - **Carbonic Anhydrase Inhibitors :** Acetazolamide.
    - **Aldosterone Antagonists :** Spironolactone.
    - **Osmotic Diureties :** Mannitol, Isosorbide, Glycerol.
    - **Xanthines :** Theophylline.

Pharmacological actions

- 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.

Indications:

- Hypertension
- Oedema
- Diabetes
- Congestive Heart failure
- Hypercalcemia
- Certain Kidney disease

- Liver cirrhosis (damage)
- Poisoning

Contraindication

- Hypokalemia
- Hypotension
- Hyponatremia

Doses

- ✓ Chlorothiazide (125- 500 mg/ d)
- ✓ Hydrochlorothiazide (12.5 -50 mg/d)
- ✓ Spironolectone (25-50 mg/d)
- ✓ Amiloride (5-10 mg/d)
- ✓ Furosemide (20-80mg/d)
- ✓ Bumetanide (0.5- 2 mg/d)

Antidiuretics

- → The drugs decrease the volume of urine are called antidiuretics.
- → These drugs inhibit urine formation by increasing the reabsorption of water in the kidney.

Classification

- **Antidiuretic hormones and its Analogues :** Vasopressin (ADH) , Desmopressin , Lypressin , Terlipressin . (these last 3 are analogues of Vasopressin)
- **Thiazides (in patients with Diabetes insipidus) :** Amiloride
- **Miscellaneous** : Carbamazepine , Chlorpropamide , Indomethacin

Pharmacological Actions

- These drugs act on kidney and increase the reabsorption of water.

Indications

- To treat bedwetting.
- Thiazides are used to treat Diabetes Insipidus (increased urine volume due to problem in hypothalamus or in pituitary or in kedney)

Contraindication

- In Ischemic heart disease
- In hypertension
- Chronic nephritis
- Psychogenic polydipsia (a mental disorder in which patient urge to drink water and drink all day , although he doesn't need)

Doses

- ✓ Vasopressin 5-10 U injection
- ✓ Lypressin 10 U i.m. or s.c