SNS COLLEGE OF ALLIED HEALTH SCIENCES

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Affiliated to Dr MGR Medical University, Chennai

DEPARTMENT : OPERATION THEATRE AND ANAESTHESIA TECHNOLOGY

COURSE NAME : PHARMACOLOGY

UNIT : EMERGENCY DRUGS

TOPICS : AMINOPHYLLINE, HYDROCORTISONE, ANTIHISTAMINES, POTASSIUM

EMERGENCY DRUGS

- Emergency drugs are medications that are essential for immediate use in critical or life-threatening situations.

- These drugs are typically administered in emergency medical settings such as hospitals, ambulances, emergency rooms, or other healthcare facilities where rapid intervention is essential to stabilize a patient's condition.

AMINOPHYLLINE

Class: Methylxanthine derivative.

Mechanism of Action:

- Aminophylline relaxes smooth muscles, particularly in the bronchial airways.
- It works by inhibiting phosphodiesterase, leading to increased levels of intracellular cyclic AMP. This results in bronchodilation and anti-inflammatory effects.

Pharmacodynamics:

Bronchodilation, increased respiratory drive, mild diuresis, and central nervous system stimulation.

Pharmacokinetics:

Aminophylline is typically administered orally or intravenously. It undergoes hepatic metabolism, primarily in the liver, and has a narrow therapeutic window.

Indications:

Treatment of asthma and chronic obstructive pulmonary disease (COPD).

Contraindications:

Hypersensitivity to xanthines, active peptic ulcer disease, and severe hypotension.

Side Effects:

Common side effects include nausea, vomiting, headache, and insomnia. Serious side effects may include arrhythmias, seizures, and hypotension.

Technician Role:

Monitoring serum levels is crucial due to the narrow therapeutic range. Monitoring for signs of toxicity, such as nausea, vomiting, and cardiac arrhythmias, is also essential.

HYDROCORTISONE

Class:

Corticosteroid (Glucocorticoid).

Mechanism of Action:

Hydrocortisone exerts anti-inflammatory and immunosuppressive effects by inhibiting the production of inflammatory mediators and suppressing immune responses.

Pharmacodynamics:

Modulation of gene expression, reduction of immune response, and suppression of inflammation.

Pharmacokinetics:

Available in various forms (oral, topical, intravenous). It undergoes hepatic metabolism.

Indications:

Allergic reactions, inflammatory conditions, autoimmune disorders, and various skin conditions.

Contraindications:

Systemic fungal infections, live virus vaccines, and known hypersensitivity.

Side Effects:

Adrenal suppression, immunosuppression, osteoporosis, and hyperglycemia.

Technician Role:

Regular monitoring of blood pressure, blood glucose levels, and bone density. Monitoring for signs of adrenal insufficiency during prolonged use.

ANTIHISTAMINES

Class:

First-generation (e.g., diphenhydramine) and second-generation (e.g., loratadine) antihistamines.

Mechanism of Action:

Competitively block histamine receptors, preventing the effects of histamine release during allergic reactions.

Pharmacodynamics:

Relief of allergic symptoms such as itching, sneezing, and rhinorrhea.

Pharmacokinetics:

Variability between first-generation and second-generation antihistamines. They may be metabolized in the liver, with varying half-lives.

Indications:

Allergic rhinitis, urticaria, and pruritus.

Contraindications:

Hypersensitivity to antihistamines, acute asthmatic attacks, and narrow-angle glaucoma (for first-generation antihistamines).

Side Effects:

Sedation (more common with first-generation), dry mouth, constipation, and urinary retention.

Technician Role:

Monitoring for signs of sedation, particularly with first-generation antihistamines.

POTASSIUM

Class:

Electrolyte.

Mechanism of Action:

Essential for cellular function, involved in nerve transmission, muscle contraction, and maintaining proper heart rhythm.

Pharmacodynamics:

Regulation of cellular membrane potential and osmotic balance.

Pharmacokinetics:

Absorbed in the small intestine, excreted primarily by the kidneys.

Indications:

Treatment and prevention of hypokalemia.

Contraindications:

Hyperkalemia, severe renal impairment, and certain medications that can lead to hyperkalemia.

Side Effects:

Gastrointestinal disturbances, hyperkalemia (with excessive supplementation).

Technician Role:

Regular monitoring of serum potassium levels is crucial to prevent both hypokalemia and hyperkalemia.

ASSESSMENT

- What is the Class of Aminophylline ?
- What all are the Indications of Antihistamine ?