**FOURTH EXERCISE**

**SPECIFIC MEDICATIONS FOR THREATING ALLERGIC DISEASES**

**H1 ANTAGONISTS**

**First Generation H1 Blockers**

**Mechanism of Action:** Competitive H1 receptor antagonist

Chlorpheniramine, Diphenhydramine, Hydroxyzine, Promethazine hydrochloride, Triprolidine, Azelastine (oral and topical), Levocabastine (topical)

**Advantages**: Systemic effect, generally safe, cheap

**Disadvantages:** Dry mouth, marked sedationcaused by their effects on histamine receptors in the brain. Drowsiness,Dosage: 3tabl./day,Visual disturbance, Urinary retention, Arrhythmias.

Tachyphylaxis - pharmacological term. A rapid appearance of progressive decrease in response to a given dose after repetitive administration of a pharmacologically or physiologically active substance.

Side effect –antiemetic,Increased appetite,**Potentiating alcohol effects.**

**Second and Third Generation H1 Blockers (non-sedating antihistamins)**

Have been developed to reduce or eliminate the sedation and anticholinergic adverse effects that occur with older H1 receptor antagonists

Astemizole, Azelastine,Ebastine, Ketotifen, Mmizolastine , Terfenadine,

Cetirizine dihydrochloride, Levozetirizin, Cetirizine dihydrochloride, Loratadine, Desloratadine, Fexofenadin

**Advantages**:

Less sedation due to block of peripheral H1 receptors without penetrating the blood-brain barrier,

Exellent profile of safety (insignificant liver metabolism, lack of cardiotoxic effect), Dosage: 1 tabl./day, **Non- potentiating alcohol effects,** Lesstachyphylaxis. Onset of action – 1 hour after oral administration .

**Disadvantages**

Macrolide antibiotics such as erythromycin, clarithromycin, ketoconazole-class broad-spectrum antifungal drugs, inhibit terfenadine or astemizole (Hismanal) metabolism.

Toxic levels of terfenadine (Seldane) or astemizole (Hismanal) may induce potentially fatal cardiac arrhythmias.

The new H1 antihistamines are contraindicated for concurrent use with macrolide antibiotics and ketoconazole-class and fungal drugs or in the presence of impaired hepatic function or inpatients predisposed to arrhythmias.

**Indications**

Acute and chronic urticarial, Edema Quincke,Allergic rhinitis (effective for treating nasopharyngeal itching, sneezing, watery rhinorrhea, and ocular itching, tearing, erythema), Insect bites, Atopic dermatitis, Contact dermatitis, Relieving symptoms of pruritus, Anaphylactic shock.

**Leukotriene antagonists (Leukotriene modifiers)**

1. Leukotriene-receptor antagonists prevent leukotrienes from binding to its receptors
2. Leukotriene synthesis inhibitors prevent synthesis of leukotrienes by blocking the enzyme, 5-lipoxygenase, which is necessary for the formation of leukotrienes.

The leukotriene receptor antagonists are among the most prescribed drugs for the management of asthma, used both for treatment and prevention of acute asthmatic attacks.  This class of drugs acts by binding to cysteinyl leukotriene (CysLT) receptors and blocking their activation and the subsequent inflammatory cascade which cause the symptoms commonly associated with asthma and allergic rhinitis. Agents: Montelukast, Zafirlukast, Pranlukast. Most used is Montelukast. Montelukast is taken once daily.

**Side effects:** headache, stomachache or flu-like symptoms for children.

**Indications**

1. Bronchial asthma
2. Aspirin induced bronchospasm
3. Exercise induced bronchospasm
4. Neutrophilic asthma
5. Asthma in smokers
6. Allergic Rhinitis
7. Comorbidity of Bronchial Asthma and Allergic Rhinitis

**Corticosteroids**

A class of steroid hormones produced in the adrenal cortex. Anti-inflammatory drugs.Generally grouped in three classes based on chemical structure.

1. Short acting: Hydrocortison, Cortisone

2. Medium: Prednisone, Prednisolone, Methylprednisolone

3. Long acting: Triamcinolone, Dexamethasone, Bethamethasone, Beclomethasone

Route of administration:

1. Topical administration

2. Inhaled steroids

3. Oral forms

4. Systemic forms

**Classification of commonly used topical corticosteroids**

Superpotent: betamethasone dipropionate 0.05% in optimized vehicle, clobetasol propionate 0.05%

High potency: betamethasone dipropionate 0.05%, betamethasone valerate0.1%, mometasonefuroate, 0.1%

Moderate potency: betamethasone dipropionate 0.05% - cream, triamcinolone, methylprednisolone

Low potency: hydrocortisone ,desonide

**Side effects**

Hyperglycemia - **Elevated Blood Sugar,** Osteoporosis, Skin atrophy, Infections,

**Gastrointestinal Ulcers or Bleeding, Weight gain,** Insomnia, **Mood Changes,** Fluid Retention and Elevated Blood Pressure, **Eye Problems,** Growth retardation, **Aseptic Necrosis**

**Indications**

Eczema, Asthma, Hay fever, Anaphylactic reactions.

**Theophylline**

Theophylline medications are part of bronchodilators group that affect the muscles in the breathing tubes. Theophylline stimulates the muscles so that they relaxe, making the breathing tubes widen, making it easier to breathe.

1. Short-acting (6-12 hours**)**
2. Long-acting (24 hours)

**Dosage**

1. Short-acting. A common dosage of theophylline is 200-400 mg twice daily, however, each person will vary. Blood levels of theophylline should be checked shortly after starting treatment, then regularly after that time. Theophylline drugs are best taken on an empty stomach, either 1 hour before or 2 hours after a meal.
2. Long-acting. Up to 800 mg daily, but the amount must be carefully regulated

**Side effects**

Theophylline dosages require careful management, since serious side-effects can occur from too much theophylline. A blood test is available to determine safe levels of theophylline in the blood, however, various situations can cause levels to fluctuate. Other medications, smoking (or stopping smoking), alcohol, viral infections and heart failure can all cause levels to suddenly increase or decrease.

**The most common side-affects**: trembling, nausea, headache, dizziness, heartburn, stomach pain, loss of appetite, restlessness, nervousness and sleeplessness.

**More serious side-effects:** vomiting, heart irregularities (arrhythmias), seizur

**Indications**

Bronchial asthma

Chronic obstructive pulmonary disease (COPD)

Hypersensitivity Pneumonitis

**Sympathomimetic drugs**

Agents that mimic the sympathetic nervous system, acting at alpha- or beta-adrenergic receptors within target tissues; vasoconstrictor sympathomimetics raise blood pressure by acting on alpha-adrenergic receptors, causing central vasoconstriction; beta receptor-active sympathomimetics dilate bronchi and peripheral blood vessels; beta-blockers block beta-receptor sites and promote peripheral vasoconstriction; adrenaline is a sympathomimetic drug that acts on both alpha- and beta-adrenergic receptors and is used to counter symptoms of anaphylaxis (it both raises blood pressure and dilates bronchi)

**Beta 2-Adrenoceptor Agonists (β-agonists)**

Activation of β2-adrenoceptors in the lungs causes bronchodilation through smooth muscle relaxation.

1. Short-acting (6-12 hours) (**SABA**): salbutamol, levosalbutamol, terbutaline, fenoterol,
2. Long-acting (24 hours) (**LABA**): salmeterol, formoterol, vilanterol

**Side effects**

Tachycardia, tremor, sweats, agitation, hypotension, decrease cardiac output, arrhythmias.

**Indications**

Bronchial asthma

Chronic obstructive pulmonary disease (COPD)