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 H_1 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 H_1 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 β_2-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)