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DRUGS ACTING ON RESPIRATORY TRACT

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ABSTRACT

The function of the lungs in gas exchange which is the transfer of oxygen from the atmosphere to the tissues & the elimination of carbondioxide from the tissues to the atmosphere.symptoms of respiratory diseases (a) sputum (b) cough (c) breathlessness (d) wheeze (e) chest pain .Symptoms of upper respiratory tract diseases (a) Rhinites (b) common cold (c) pharyngitis (d) laryngitis (e) bacterial tracheitis (f) sinusitis.symptoms lower respiratory tract diseases (a) pneumonia(b)pneunsococcal pneumonia (c)legionnaires diseases(d) myco plasma pneumonia(e) staphyloccal pneumonia(f) asthma.therapeutic dose for theophylline is very close to the toxic dose , side effects are headache, insomnia,nausea& vomiting an overdose can lead to the scizures ,brain damage& death. Ipratropium nasal spray is very useful for the treatment of rhinarrhea. When used by inhalation minor fraction gets systematically absorbed which is eliminated in the urine in the form of inactive metabolities.guaifenesin is used to relieve cough secretion due to colds. It acts by virtue of its local pharyngeal effects. So several drugs effects on respiratory tract.

INTRODUCTION:

Lung may be considered as a mass of thing wet epithelium (the alveolar capillary membrane) which allows oxygen (O_2) to diffuse rapidly from the air into a network of capillaries in close contact with the terminal respiratory units contact lungs. At the same time, carbon-dioxide from these capilaries diffuses rapidly in to the air. The function of the lungs is gas exchange which is the transfer of oxygen from the atmosphere to tissues and the elimination of carbon-dioxide from the tissues to the atmosphere. Throughout each lung a network of elastic and collagernous fibrous tissue from a matrix surrounding the capillaries and alveoli.

The fibrous connective tissue prevents over expantion of the all alveoli. The lungs fill but move freely with in the thoracic cage the sealed cavity formed due to the presents of thoracic is known as pleura cavity it is lined with a lubricated membrane, the ‘peraietal pluera’. Lungs are also covered with a similar membrane, the viscral pleura so that they slide freely inside the pleural cavity and enlarge when the cavity enlarges. Breathing moments are controlled and coordinated involuntarily by the respiratory center in the medulla oblongata via th lower motor neurones to the inspiratory and expiratory muscles. Trachea contains bands of smooth muscles and the walls of the smaller respiratory

passages contain a layer of smooth muscles beneath the mucosa.these smooth muscles contain both sympathetic β_2-adrenoceptors and parasympathetic (cholinergic) receptors.

Symptoms of respiratory disease

a) **Sputum:** it is coughed up when normal mucociliary clearance mechanisms are overloaded by excessive mucus production. Daily volumes greaterthan 50ml may be coughed up in conditions such as chronic bronchitis and systic fibrosis
b) **Cough:** It is part of natural defence mechanism for clearing air passages of foreign materials and excess mucus. It is frequently attributed to upper respiratory tract diseases like common cold are pharyngitis.
c) **Breathlessness:** It is an unpleasant awarness about the sensation of breathing.
d) **Wheeze:** when the intra-thoracic airways are already narrowed, further reduction in airway calibre during expiration results in airway closure. This sensation of limited airflow is known as a 'wheeze'. Wheezing is the sound produced by air moving through the narrowed airways.
e) **Chest pain:** Pleural pain may arrise due to infection, inflammation or malignant involvement of the parietal pleura. Chest wall pain due to rib fractures causes local pain and tenderness.

Upper respiratory tract diseases

a) **Rhinitis:** It may be infectious or non–infectious the non-infectious rhinitis may be allergic are non-allergic. The infectious form is of short duration and the nasal exudate is offen yellow–green. Rhinitis causes itching, sneezing, rhinorrhoea, congestion, nasal obstruction, headache, fever and pains. A decongestant spray will relleve nasal congestion and obstruction while anticholinergic agents may reduced rhinorrhea.
b) **Common cold :** It is characterized by increased nasal discharge and reddened nose. Other important symptoms that may be associated with common cold include chills, fever headache, malaise, sneezing, sore-throat, nasal congestion, rhinorrhea, non-productive cough, conjectivities and feeling of fullness in ears or phranasal sinusis.
c) **Pharyngitis (sore throat):** It is an acute inflammatory syndrome characterized by soreness, hoarseness, scratchiness, malaise, fever and Iymphadenopathy. In some cases pharyngeal or tonsillar exdates and phryngeal erythema appear.
d) **Laryngitis:** It is an acute inflammatory process of larynx characterised by soreness, cough, hoarseness, dysphagia, and loss of voice. In some cases erythematous and edematous laryngeal mucosa and superfilcial ulceration may also be seen. Antiboitics like erithromycin, amoxicillin, cephalosporins may be used when bacterial pathogen is involved.
e) **Bacterial Tracheitis :** It is similar to crop but is mainly of bacterial origin. It is commonly seen in older children and is characterized by dyspnea, high fever, purulent sputum and acutely inflammed subglottic area.
f) **Sinusitis:** The paranasal sinuses consists of four paired structures-the maxillary, ethmoidal, spehenoidal and frontal sinuses.

Lower respiratory tract diseases:
Pneumonia: It is an acute inflammation of

pulmonary tissues induced by either bacteria, viruses, fungi, Legionella species and pneumocystis carinii especially in immunodeficient patients. The major symptoms of the disease include nausea, vomiting, malaise, sore throat, sudden chills, dyspnea, fever, chest pain, productive cough, tachycardia, weakness, leukopenia, pleutric chest pain and acute inflammation of pulmonary tissues.

a) **Pneumococcal Pneumonia:** It is caused by streptococcus pneumoniae. It can be treated with either giving 6,00,000 units of procaine penicillin G Intramuscularly per 12 hours or penicillin V orally 250mg 4 times a day
b) **Legionnaires' disease:** It is an acute bacterial bronchopneumonial disease caused by gram negative bacilli, legionella pneumophilia. It is transmitted to the patient via airporne inhalation.
c) **Mycoplasma pneumonia: T**his disease is transmitted either by close contact or by inhalation of aerosolized organisms. It is reported mainly in children and young adults between the ages of 5 to 35 years.
d) **Staphylococcal pneumonia:** In this disease staphylococcus aureus is a causative organism. Usually in this disease appears as a complication of viral infection. Drugs of choice in the treatment of this disease include methicillin, naficillin, oxacillin, cloxacillin, cefazolin and vancomycin. Therapy should be continued for at least 4 – 6 weeks.
e) **Asthma:** The word asthma is derived from a Greek word meaning difficulty in breathing it is mainly caused by narrowing of airways or bronchial obstruction. Asthma is treated with combination therapy using inhaled sympathomimetics, long acting theophylline preparation and corticosteroids

Drugs treatment of Asthma:

Drug therapy for asthma should follow a rational sequence depending on its severity and response to the therapy. During an asthma attack the tissue of the airway inner wall is inflamed and the mucus is thick and sticky continuing production of mediators and messenger substances of inflammation such as histamine and leukotrienes keeps the process going. Recognition of the inflammatory component of asthma has led to more use of glucorticoid stiroids as anti – inflammatory agents. The therapeutic dose for theophylline is very close to the toxic dose. Side effects are diarrhoea, headache, insomnia, nausea and vomiting. An overdose can lead to seizures, brain damage and death for these reasons some doctors tend to shy away from theophylline. Some physicians favour theophylline to supplement β_2-adranergic agents and steroids. There is renewed interest theophylline because of indications that it modifies the immune response, relieves inflammation, and protects airways from antigens in ways that seem to go beyond any activity as a phosphodiesterase inhibitor. Theophyllineephedrine combinations are available as tablets and syrups.

Drugs commonly used in Treatment of Respiratory tract diseases:

a) **Antihistaminic Agents :** Anthistaminic agents are usually drugs of first choice in the treatment of allergic rhinitis and common cold. They can however be used only

symptomatic benefit examples include promeophazine, azatadine, astemizol and terfenadine.

Terfenadine is a butyrophenone derivative having antihistaminic activity without sedative action. It is used in the treatment of seasonal and perennial allergic arhintis. Adult oral dose is 60mg every 8-12 hours.

b) Anticholinergic Agents: Ipratropium nasal spray is very useful for the treatment of rhinorrhea. When used by inhalation, minor fraction gets systematically absorbed which is eliminated in the uraine in the form of inactive metabolites. It as a plasma half-life of 1.5 – 4.0 hours. Adverse effects include nausea, dry mouth, blurred vision slurred speech, skin rash, fever, dizziness, drowsiness, headache, confussion and hallucinations

c) Soothing Agents : These are bland, mucilaginous or oily agents used to sooth irritated or inflamed tissues when cough stems irritated pharyngeal mucosa examples of soothing agents include alcholos, propylene glycol, compound tincture of benzoin, linseed, elmbark, etc.,

d) Expectorants: Cough is an important mechanism for expectorating bronchial secretions. Guaifenesin is an expectorant used to relieve cough secretion due to colds, influenza or minor upper respiratory tract infections it acts by virtue of its local pharyngeal effects it is usually used along with a mucolytic agent to liquify or to loosen the mucus or phlegm present in the lungs. Adverse effects include nausea, vomiting, diarrhoea, stomach pain pain and drowsiness. Adult oral dose is 200 – 400mg after every 4 hours a day.

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