



Tikrit University
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Diseases of Respiratory System

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Lecturers link

Diseases of Respiratory System

* Principles manifestation of respiratory insufficiency:

I- Abnormalities in rate, depth and ease of breathing:

- **Polypnea:** is rapid breathing.
- **Tachypnea:** is very rapid usually shallow breathing.
- **Dyspnea:** is difficult breathing.
- **Expiratory dyspnea:** is prolonged and forceful expiration occur in obstructive lower airway diseases.
- **Inspiratory dyspnea :** is prolonged and forceful inspiration due to obstruction of extra thoracic
- **Open mouth breathing:** is difficult breathing with the mouth held open with the tongue protrude.

II- Diseases causing dyspnea at rest:

Dyspnea at rest occur in many disease :

- 1- Filled alveoli (pneumonia).
- 2- Compressed alveoli (Pneumothorax).
- 3- Obstructive air passage (Nasal obstruction).
- 4- Environmental deficiency of oxygen.
- 5- Cardiovascular disease (shock).
- 6- Disease of blood (Methemoglobinemia).
- 7- General systemic states (acidosis, pain).
- 8- Nervous system (tetanus).

III- Respiratory noises:

Respiratory may be accompanied by audible noises which indicate certain normal or abnormal occurrences in the respiratory tract such as:

- 1- **Sneezing:** is a sudden, involuntary noisy expiration caused reflex by irritation of the nasal mucosa.
- 2- **Snorting:** is a forceful expiration of air by nostrils.
- 3- **Stridor:** is an inspiratory stenosis sound originating from a reduction in the caliber of the larynx.
- 4- **Snoring:** is deep inspiration originating from vibration of pharyngeal mucosa.
- 5- **Wheezing:** Is a high pitched sound made by air flowing through a narrow lumen such as inflamed nasal cavity.

6- Expiratory grunting: is grunting sound with expiration, its occur with diffuse pulmonary disease.

7- Coughing: cough is an explosive expiration of air from the lungs it is initiated by reflex stimulation of the cough center in the medulla oblongata by irritation of sensory receptor in one of various organ especially the respiratory tract the stimulates may originate in the pharynx, larynx, trachea or bronchi.

IV- Nasal discharge:

Excessive or abnormal nasal discharge is usually indication of respiratory tract disease. And this may be originate from the lesion in the nasal cavities (pharynx, larynx, trachea & lungs).

V- Epistaxis & Hemoptysis:

- Epistaxis or nose bleeding is a result of disease of the mucosa of the upper respiratory tract.

- Hemoptysis: is coughing up blood which usually originates from profuse hemorrhage in the lower respiratory tract.

VI- Cyanosis:

Is a bluish discoloration of the skin conjunctive and visible mucosa, this occur when the hemoglobin concentration of the blood is normal but incomplete oxygenation of the hemoglobin . the causes of cyanosis include congenital heart disease, hypoxia, pulmonary disease, laryngeal obstruction, laryngitis. And peripheral cyanosis caused by cutaneous vasoconstriction due to low cardiac output, exposure to cold air or water.

VII- Hypoxia :

Failure of the tissue to receive an adequate supply of oxygen occur in a number of way:

1- Anoxic anoxia:

Occur when there is defective oxygenation of blood in the pulmonary circuit and is usually caused by primary disease of the respiratory tract & any obstruction of air way.

2- Anemic hypoxia:

Occur when there is a deficiency of hemoglobin per unit volume of blood, the oxygen tension are normal but the oxygen carrying capacity of the blood is reduced occur in poisoning caused by nitrate.

3- Stagnant hypoxia:

Is the state in which the rate of blood flow through the capillaries is reduced but the oxygen saturation of arterial blood is normal.

4- Toxic hypoxia:

Occur when the blood is fully oxygenated but because of tissue oxidation systems the tissue cannot take up oxygen, such as cyanide poisoning.

* **Special examination of the respiratory system:**

- 1- Laboratory evaluation of respiratory secretion.
- 2- Pleuroscopy & fiber optic endoscopy.
- 3- Thoracocentesis.
- 4- Thoracic radiography & ultrasonography.
- 5- Auscultation and percussion.

* **Principles the treatment of respiratory system diseases:**

- 1- Antimicrobial therapy (Oxytetracyclin, Pencillin, Tylosine, Arthromycine, Lincomycin).
- 2- Antiparasitic drugs (Albendazole, Tetramezole, Ivermectine).
- 3- Environmental alteration and oxygen therapy.
- 4- Respiratory center stimulation (O_2 with 15% CO_2).
- 5- Expectorant (ammonium chloride or ammonium carbonate).
- 6- Relief of respiratory obstruction (Tracheotomy).
- 7- Bronchodilators (Aminophyline or atropine sulphate).
- 8- Cough depressant (Codain sulphate).
- 9- Antipyretics (Aspirin, phenylbutazone).
- 10- Decongestant (Ephedrine , phenylephrine).
- 11- Drainage of exudate.
- 12- Diuretics (Furosemide, Acetazolamide, Lasix).
- 13- Corticosteroids or antihistamine.

* **The major defense mechanism of the respiratory tract includes:**

- 1- Aerodynamic filtration by the nasal cavities.
- 2- Sneezing.

- 3- Local nasal antibody.
- 4- The laryngeal reflex.
- 5- The cough reflex.
- 6- Mucociliary transport mechanism.
- 7- Alveolar macrophage.
- 8- Systemic and local antibody system

Diseases of lungs

I- Pneumonia:

Pneumonia is inflammation of the pulmonary parenchyma usually accompanied by inflammation of the bronchioles and often by pleurisy . it is characterized clinically by an increase in the respiratory rate , coughing, abnormal breath sounds on auscultation.

Etiology:

- 1- Pasteurella species, Mycoplasma, Streptococcus, Haemophilus, chlamedia.,T.B.
- 2- Lung worms (Dictyocoulus filarial in sheep, D. viviporus in cattle, D. arnfeldi in horse).
- 3- Systemic mycosis, lesion are focal only.
- 4- Aspiration pneumonia, by aspirate entity.
- 5- Toxoplasmosis.
- 6- Viruses (Para influenza, rhinovirus, Adenovirus).
- 7- Melioidosis (pseudomonas pseudomalli).

Pathogenesis:

- Deposition of infectious agent or particles in the respiratory tract and the pneumonia develops varies with causative agent and its virulence.
- The reaction of the lung tissue may be form of an acute fibrinous process as in pasteurellosis and spread to the alveolar epithelial cells and development of alveolar edema and thickening of the interstitial tissue and lymphocytic aggregation around the alveoli, blood vessels and bronchioles.
- The pathophysiology of all pneumonia is based upon interference with gaseous exchange between the alveoli and blood, anoxia and hypercapnia develop with result polypnea , dyspnea, tachypnea.

- The defect mechanism include the accumulation of inflammatory exudate in the bronchi and olveoli is manifestation by abnormal lung sound as crackles and wheeze on auscultation.

Clinical findings:

- 1- Rapid shallow breathing in early pneumonia.
- 2- Dyspnea occur in the later stage.
- 3- Coughing but varying with the nature of the lesion.
- 4- Crackling sounds in auscultation.
- 5- In acute cases there is toxemia, anorexia, depression and tackycardia & lie down.
- 6- Fever, in appetence , Purulent nasal discharge occur in lung abscess.

Treatment:

- 1- Antimicrobial drugs (Oxytetracycline, Penicillin). In bacterial infection.
- 2- Antiparasitic drugs (albendazole, levamezole, ivermectine) in parasitic infection.
- 4- Corticosteroids (Dexamethasone) .
- 5- Expectorant.
- 6- Supportive therapy (good food & housed in well ventilated).

II- Pulmonary congestion and edema:

Pulmonary congestion is caused by an increase in the amount of blood in the lungs due to engorgement of the pulmonary vascular, its sometimes followed by pulmonary edema when intravascular fluid escapes in to the parenchyma and alveoli.

Etiology:

- 1- Early stages of most cases of pneumonia.
- 2- Inhalation of smoke and irritant gases.
- 3- Anaphylactic reaction.
- 4- Hypostasis in recumbent animals.
- 5- Acute & Congested heart failure.

Pathogenesis:

- In pulmonary congestion the effective alveolar air space is markedly reduced because of engorgement of the pulmonary capillaries, the vital capacity is reduced and oxygenation of the blood is impaired.

- The edema is caused by damage to capillary walls by toxins, or transudation of fluid due to increase hydrostatic pressure in the capillaries, filling of the alveoli and bronchi and this lead to prevents gaseous exchange.

Clinical findings:

- 1- Depth of respiration & extreme dyspnea.
- 2- Mouth breathing & head extended.
- 3- The respiratory rate and heart rate is usually increased.
- 4- Coughing is usually present but is moist cough.
- 5- Nasal discharge and may be blood stained.
- 6- Death occurs may be due to asphyxia respiratory failure.

Treatment:

- 1- Correction of the primary cause.
- 2- Epinephrine or adrenaline is recommended in pulmonary edema due to anaphylaxis.
- 3- Corticosteroids to maintain vascular integrity and decrease permeability of vessels.
- 4- Aminophylline to bronchodilator and give the diuretics.

III- Pulmonary emphysema:

Is distension of the lung caused by over distention of alveoli with rupture of alveoli walls clinically characterized by dyspnea, hyperpnoea, poor exercise and forced expiration, this disease occur because of chronic obstruction pulmonary diseases.

IV- Aspiration pneumonia:

This disease common in farm animals occurring when passage of stomach tube during treatment, dipping of animals, vomiting in ruminant and horse, in farm animals feed on dusty feeds inhale many dusts particles.

Diseases of the pleura

I- Pleurisy (pleuritis):

Its inflammation of plura of lung is characterized by varying degree of toxemia, painful, shallow breathing, pleural frictional sound.

Etiology:

- 1- Penetration usually traumatic of thoracic wall.

- 2- Secondary causes occur by infection (Pasteurella spp. , mycoplasma spp., haemophilus, , Tuberculosis).

Clinical findings:

- 1- Fever, toxemia, tachycardia, anorexia, depression and coughing.
- 2- Nasal discharge, and this may vary from mucohemorrhage to mucopurulent.
- 3- Pleural pain is common and manifested by stiff forelimb gait and abducted elbows.
- 4- Pleural frictional sounds may be audible over thoracic wall.

Treatment:

- 1- Antimicrobial therapy (penicillin or oxytetracyclin or Cephalosporin's).
- 2- Drainage and lavage of pleural cavity.
- 3- Thoracotomy.

II- Hydrothorax & Hemothorax:

It is accumulation of edematous transudate or whole blood in the pleural cavity, is manifested by respiratory embarrassment caused by collapse of the ventral parts of the lungs.

Etiology:

- 1- Hydrothorax:
 - general edema due to congestive heart failure or hypoproteinemia.
 - African horse sickness or bovine viral leucosis.
- 2- Hemothorax :
 - Traumatic injury to thoracic wall.
 - Hemangio sarcoma of pleura.

Pathogenesis:

Accumulation of fluid in the plural cavities causes compression atelectasis of the ventral portions of the lungs, compression of atria by fluid may cause an increase in venous pressure in the great veins.

Clinical findings:

- 1- Acute hemorrhage anemia occur when extensive bleeding.
- 2- Dyspnea & absence of breath sounds .
- 3- Absence of movement of the ribs on affected side.
- 4- Engorgement of jugular veins.

Treatment:

- 1- Aspiration of fluid from the pleural sac.
- 2- Blood transfusion in sever hemothorax.

III- Pneumothorax:

Entry of air in to the pleural cavity in sufficient quantity causes collaps of the lung and respiratory embarrassment. Caused by rapture of the lung by traumatic rib fracture perforating lung.

Disease of the upper respiratory tract**I- Rhinitis:**

Rhinitis is inflammation of nasal mucus membrane, characterized by sneezing, wheezing and starter during inspiration and nasal discharge may be serous, mucoid or purulent in consistency depending on causes.

Etiology:

Usually occur in conjunction with inflammation of other part of respiratory tract.

- 1- Cattle: Catthral rhinitis, Mucosal disease, Rinder best, Fungal disease.
- 2- Sheep: Melioidiosis, Blue tongue, pox, Ostrus ovis, Alergic rhinitis.
- 3- Horse: glanders, Strangles, Epizootic lymphangitis, Influenza.

Clinical findings:

- 1- Nasal discharge which is usually serous initially & mucoid soon become.
- 2- Erythema, erosion or ulceration may be visible inspection.
- 3- The inflammation may be unilateral or bilateral.
- 4- In irritation nasal may cause shaking of head.

Treatment : give the antibiotic locally and systemically.

II- Laryngitis, Tricheitis, Bronchitis:

Inflammation of air of the air passage (Larynx, Trachea, Bronchi) their characterized by cough and nasal discharge.

Etiology:

- 1- Infection bovine rhinotracheitis in cattle.

- 2- Chronic infection with actinomycespyogens.
- 3- Equine herpes virus, equine viral arteritis & strangles in horse.
- 4- Sudden exposure to the cold.

Treatment: Antimicrobial therapy (penicillin & Streptomycine).

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