

RESPIRATORY BLOCK (OBJECTIVES AND PATHOLOGY LECTURES CONTENTS)

Number of Lectures: 6

Number of Practicals: 2

Tutors: Dr. Ammar Al-Rikabi (male students) - ammar_rikabi@hotmail.com
Dr. Maha Arafah (female students) - marafah@hotmail.com
Dr. Amer Shafie (male practicals) - dr_amer_shafie@yahoo.com
Dr. Shaesta Zaidi (female practicals) - snz24@yahoo.com

LECTURE ONE : Pathology and pathogenesis of bronchial asthma.

OBJECTIVES:

At the end of this lecture, the student should be capable of:

- A] Understanding asthma as an episodic, reversible bronchoconstriction caused by increased responsiveness of the tracheobronchial tree to various stimuli.
- B] Knowing that asthma is divided into two basic types: extrinsic or atopic allergic and intrinsic asthma.
- C] Understanding the morphological changes seen in the lungs in cases of severe asthma.

CONTENTS:

- 1] Definitions of asthma as one of the chronic obstruction airway diseases.
- 2] Types and pathogenesis of extrinsic (immune) asthma and extrinsic (non-immune) asthma.
- 3] Clinical presentation and pathological changes seen in the bronchial tree in cases of asthma.
- 4] Complications of asthma: superimposed infection, chronic bronchitis and pulmonary emphysema.
- 5] Definition and manifestations of status asthmaticus.

LECTURE TWO: Restrictive lung diseases.

OBJECTIVES:

At the end of this lecture, the student should be able to:

- A] Understand the structure and constituents of the lung interstitium as well as the restrictive changes which occur in these diseases and lead to the development of symptoms of progressive breathlessness and cough in affected patients.
- B] Appreciate the pathogenesis of interstitial lung diseases regardless of their type. This pathogenesis include the influx of inflammatory cells into the alveoli and alveolar walls, distortion of the normal structure of alveoli, release of chemical mediators and promotion of fibrosis (honey-comb lung).
- C] Become aware of the classification of interstitial lung diseases.

CONTENTS:

- 1] Definition and causes of restrictive pulmonary diseases.
- 2] Pathogenesis of restrictive pulmonary diseases which include abnormalities in the chest wall or neuromuscular diseases that restrict lung expansion or conditions leading to interstitial accumulations of cells or non-cellular substances.
- 3] **Brief account on the clinicopathological features of:**
 - (a) Adult and neonatal respiratory distress syndromes.
 - (b) Anthracosis and coal worker's pneumoconiosis.
 - (c) Silicosis and asbestosis.
 - (d) Hypersensitivity pneumonitis (extrinsic allergic alveolitis).
 - (e) Goodpasture syndrome.
 - (f) Eosinophilic granuloma.
 - (g) Idiopathic pulmonary fibrosis.
 - (h) Sarcoidosis.

LECTURE THREE: Chronic obstructive airway diseases: chronic bronchitis, emphysema and bronchiectasis.

OBJECTIVES:

At the end of this lecture, the students should be able to:

- A] Understand that this group of disorders is characterized by an increase in resistance to airflow, owing to partial or complete obstruction at any level of the bronchial/bronchiolar.
- B] Know that the major obstructive disorders are chronic bronchitis, emphysema, asthma and bronchiectasis.
- C] Is aware that the symptom common to all these disorders is "dyspnea" (difficulty in breathing) but each have their own clinical and anatomical characteristics.
- D] Chronic bronchitis and emphysema almost always coexists.

CONTENTS:

- 1] Chronic bronchitis: definition, clinical presentation, role of cigarette smoking and air pollution, pathological changes and complications with special emphasis on cor pulmonale.
- 2] Emphysema: definition and clinical characteristics. Types of emphysema including centrilobular emphysema, panacinar emphysema (deficiency of alpha one antitrypsin), paraseptal and irregular emphysema.
- 3] Complications of emphysema with special emphasis on interstitial emphysema and pneumothorax.
- 4] Bronchiectasis: definition, predisposing factors, kartagener's syndrome (primary ciliary dyskinesia) and pathological features of bronchiectasis.

LECTURE FOUR: TUMOURS OF THE LUNG

OBJECTIVES:

At the end of this lecture, the student should be able to:

- A] Understand the incidence, age group of affected patients and predisposing factors of bronchogenic carcinoma.

- B] Is aware of the classification of bronchogenic carcinoma which include: squamous carcinoma, adenocarcinoma, small cell and large cell (anaplastic) carcinomas.
- C] Understands the clinical features and gross pathology of bronchogenic carcinoma.
- D] Have a basic knowledge about neuroendocrine tumours with special emphasis on small cell carcinoma and bronchial carcinoid.
- E] Is aware that the lung is a frequent site for metastatic neoplasms.

CONTENTS:

- 1] Bronchogenic carcinoma: aetiology, epidemiology, clinical features including superior Vena Cava syndrome, pancoast tumour, hoarseness, pleural effusion and paraneoplastic endocrine syndromes.
- 2] Types, location and clinicopathological characteristics of squamous cell carcinoma, adenocarcinoma, bronchioloalveolar carcinoma, small cell carcinoma, large cell carcinoma, carcinoid tumour and metastatic carcinoma to the lung.
- 3] Primary and secondary tumours of the pleura.

LECTURE FIVE: Pathology of lobar pneumonia and bronchopneumonia.

OBJECTIVES:

At the end of this lecture, the student should be able to:

- A] Understand that pneumonia is an inflammatory condition of the lung characterized by consolidation (solidification) of the pulmonary tissue.
- B] Is aware of the pathogenesis of pneumonia and its classification which principally include bronchopneumoniae, lobar pneumonia and atypical pneumonia.
- C] Is able to appreciate the aetiology and pathogenesis of lung abscess.

CONTENTS:

- 1] General considerations and clinical characteristics of pneumonia.
- 2] Morphologic types of pneumonias including lobar pneumonia, bronchopneumonia and interstitial pneumonia (atypical pneumonia) with special emphasis on mycoplasma pneumonia, viral pneumonia and ornithosis (Chlamydia induced).

- 3] Pneumocystis carinii pneumonia as the most common opportunistic infection in patients with AIDS.
- 4] Hospital acquired gram negative pneumonias.
- 5] Lung abscess: causes and manifestations.

LECTURE SIX: Tuberculosis.

OBJECTIVES:

At the end of this lecture, the student should be able to:

- A] Define tuberculosis.
- B] List the diseases caused by Mycobacteria.
- C] Know the epidemiology of tuberculosis (TB).
- D] List conditions associated with increased risk of Tuberculosis.
- E] List factors predisposing to extension of the infection.
- F] Recognize the morphology of Mycobacteria and its special stain (the Ziehl-Neelsen) as well as the morphology of granulomas in TB (tubercles).
- G] In regards to Mycobacterial lung infection: Compare and contrast the following in relation to their gross and histologic lung pathology:
 1. Primary tuberculosis (include a definition of the Ghon complex).
 2. Secondary or reactivation tuberculosis.
 3. Miliary tuberculosis.
- H] List organs other than lung that are commonly affected by tuberculosis.
- I] Know the basis and use of tuberculin skin (Mantoux) test.
- J] List the common clinical presentation of tuberculosis.
- K] List the complication and prognosis of tuberculosis.

TAKE HOME MESSAGES:

- 1] *Mycobacterium tuberculosis* is the causative organism of tuberculosis (TB) in the lungs and elsewhere.
- 2] *Mycobacterium tuberculosis* gains access to the lung by inhalation and causes pulmonary TB.
- 3] *Mycobacterium tuberculosis* infection by ingestion is now rare, but not completely eradicated.
- 4] A granuloma in TB, termed a "tubercle" is composed of activated macrophages, Langhan's giant cells with surrounding lymphoid cells and fibroblasts with central caseation necrosis.
- 5] Primary tuberculosis is the form of disease that develops in a previously unexposed and therefore unsensitized person.

- 6] Secondary (reactivation) tuberculosis arises in previously exposed individuals when host immune defenses are compromised and usually manifests as cavitory lesions in the lung apices.
- 7] Both progressive primary tuberculosis and secondary tuberculosis can result in systemic spreading, causing life-threatening forms such as miliary tuberculosis and tuberculous meningitis.
- 8] The outcome of tuberculosis depends on the adequacy of the host immune response.

FURTHER READING

Kumar, Cotran and Robbins: Basic Pathology, 8th edition.

KEYWORDS:

Granulomatous inflammation, immunosuppression, tuberculosis, activated macrophages epithelioid cells, Langhans' giant cells, caseation necrosis, primary tuberculosis, Ghon complex, secondary (reactivation) tuberculosis, miliary tuberculosis.