Lecture 2

Diseases of respiratory system

Asthma:

Asthma is a chronic inflammatory disorder of the airways.

Pathophysiology

The relationship between atopy{ refers to the genetic tendency to develop allergic diseases such as allergic rhinitis, asthma and atopic dermatitis} (the propensity to produce IgE) and asthma is well established.

Common examples of allergens include house dust mites, pets such as cats and dogs

- Clinical features

- Typical symptoms include recurrent episodes of wheezing, chest tightness, breathlessness and cough. Asthma is commonly mistaken for a cold or chest infection which is taking time to resolve (e.g. longer than 10 days). Classical precipitants include exercise, particularly in cold weather, exposure to airborne allergens or pollutants, and viral upper respiratory tract infections .
- .

Asthma characteristically displays a diurnal pattern, with symptoms and lung function being worse at the night at in the early morning.

With increasing severity and chronicity of the disease, there will be fixed narrowing of the airway and a reduced response to bronchodilator medication.

management

- 1-Avoidance of aggravating factors
- medications known to precipitate or aggravate asthma should be avoided ,like NSAID.
- Smoking cessation is particularly important, as smoking
- 2-Drugs
- + β2-adrenoreceptor agonist bronchodilators like salbutamol
- ++ inhaled steroid like beclometasone

2-Chronic obstructive pulmonary disease (COPD).

- Related diagnoses include:-
- A- chronic bronchitis (cough and sputum on most days for at least 3 months, in each of 2 consecutive years)
- B- emphysema (abnormal permanent enlargement of the airspaces distal to the terminal bronchioles, accompanied by destruction of their walls and without obvious fibrosis).

Etiology

- It is unusual to develop COPD with less than 10 pack years (1 pack year =20 cigarettes/day/year) and not all smokers develop the condition, suggesting that individual susceptibility factors are important.

Clinical features

COPD should be suspected in any patient over the age of 40 years who presents with symptoms of chronic bronchitis and/or breathlessness. Important differential diagnoses include chronic asthma, tuberculosis, and congestive cardiac failure.

Cough and associated sputum production are usually the first symptoms, often referred to as a ‘smoker’s cough’

Investigations

chest X-ray is essential to identify alternative diagnoses, such as cardiac failure, other complications of smoking such as lung cancer.

The diagnosis requires objective demonstration of airflow obstruction by spirometry

Treatment

+ Smoking cessation

++ Reducing exposure to noxious particles and gases

+++ Drugs

β2-adrenoreceptor agonist bronchodilators like salbutamol

inhaled steroid like beclometasone

oral bronchodilators like theophylline

- ++++ Oxygen therapy
- Long-term home oxygen therapy improves survival in selected patients with COPD complicated by severe hypoxemia
- +++++Other measures
- Patients with COPD should be offered an annual influenza vaccination and, as appropriate, pneumococcal vaccination

Pneumonia (community acquired pneumonia)

- It affects all age groups but is particularly common at the extremes of age
- Most cases are spread by droplet infection

Risk factors

- • Cigarette smoking
- • Alcohol
- • Corticosteroid therapy
- • Old age
- • Recent influenza infection
- • Pre-existing lung disease
- • HIV
- • Indoor air pollution

- Streptococcus pneumonia remains the most common infecting agent. Viral infections are important causes of CAP in children

Clinical features :

A- Systemic features such as fever, rigors, shivering and malaise predominate and delirium may be present. The appetite is lost.

B- Pulmonary symptoms include cough, which at first is painful and dry, but later accompanied by the expectoration of mucopurulent sputum. and the occasional individual may report hemoptysis.

C- Pleuritic chest pain may be a presenting feature

D- Upper abdominal tenderness is sometimes apparent in patients with lower lobe pneumonia

Investigations in CAP

Full blood count

- Very high (> 20 000/L) or low (< 4 000/L) white cell count: marker of severity
- Neutrophil leukocytosis > 15 000/L: suggests bacterial etiology.
- Sputum samples
- Gram stain and culture

Chest X-ray

Treatment :

Oxygen

Intravenous fluids

These should be considered in patients with severe illness, older patients and those who are vomiting.

Antibiotics

Uncomplicated CAP

- Amoxicillin

If patient is allergic to penicillin

- Clarithromycin 500 mg twice daily orally or Erythromycin500 mg 4 times daily orally

Severe CAP

- Clarithromycin 500 mg twice daily IV plus
- Co-amoxiclav 1.2 g 3 times daily IV or Ceftriaxone 1–2 g

Tuberculosis :

Tuberculosis (TB) is caused by infection with Mycobacterium tuberculosis (MTB)

M. tuberculosis is spread by the inhalation of aerosolised droplet nuclei from other infected patients

Factors increasing the risk of TB

- Age (children > young adults < elderly)
- Close contacts of patients with smear-positive pulmonary TB
- Overcrowding (prisons)
- Smoking
- Immunosuppression: HIV, high-dose corticosteroids, cytotoxic agents
- Malignancy (especially lymphoma and leukemia)
- Diabetes mellitus
- Chronic kidney disease

Clinical features

A -Primary pulmonary TB

Primary TB refers to the infection of a previously uninfected individual. Almost always the patient is asymptomatic. A few patients develop a self-limiting febrile illness

- Miliary TB
- Blood-borne dissemination gives rise to miliary TB, which may present acutely but more frequently is characterized by 2–3 weeks of fever, night sweats, anorexia, weight loss and a dry cough

- Post-primary pulmonary TB
- refers to exogenous (‘new’ infection) or endogenous (reactivation of a dormant primary earlier exposure. It is characteristically occurs in the apex of an upper lobe . The onset is usually developing slowly over several weeks. Systemic symptoms include fever, night sweats, malaise, and loss of appetite and weight, and are accompanied by progressive pulmonary symptoms.
- • Chronic cough, often with hemoptysis
- • Pyrexia of unknown origin
- • Unresolved pneumonia
- • pleural effusion
- • Weight loss.

Diagnosis

- Chest X ray
- Sputum*: At least 2 but preferably 3, including an early morning sample.
- Extra pulmonary
- • Fluid examination (cerebrospinal, ascitic, pleural, pericardial, joint): yield classically very low.

- Diagnostic tests
- • Tuberculin skin test
- • Culture
- • Pleural fluid: adenosine deaminase
- • Response to empirical antituberculous drugs (usually seen after 5–10 days)

- The treatment of TB is based on the principle of an initial intensive phase to reduce the bacterial population rapidly,(2 months) followed by a continuation phase to destroy any remaining bacteria. Standard treatment involves 6 months

Pulmonary embolism

The majority (80%) of pulmonary emboli arise from the propagation of lower limb DVT (deep venous thrombosis)

Risk factors for venous thromboembolism

Surgery

Post-operative intensive care

Pregnancy/ puerperium

Malignant disease

Immobility

Thrombotic disorders

Clinical features

Faintness or collapse, central chest pain, , severe dyspnea

Investigations

The chest X-ray is most useful in excluding key differential diagnoses, e.g. pneumonia

The ECG is often normal but is useful in excluding other important differential diagnoses, such as acute myocardial infarction. The most common findings in PE include sinus tachycardia.

- D-dimer usually elevated
- CT pulmonary angiography is the first-line diagnostic test. It has the advantages of visualizing the distribution and extent of the emboli.

Treatment :

- Oxygen
- Anticoagulation :examples: Heparin and warfarin
- Thrombolytic and surgical therapy