DEFINITION

1. **Bronchial asthma** is a clinical syndrome characterised by recurrent episodes of airway obstruction, which resolve spontaneously or as a result of treatment. The reversibility of the airway obstruction in asthma is the feature that distinguishes it from other forms of obstructive lung disease.

2. Bronchial asthma is associated with hyper-responsiveness of the airways. This is an exaggerated bronchoconstrictor response to stimuli that have little or no effect in normal subjects.

3. **Chronic obstructive pulmonary disease**. The conditions chronic bronchitis, bronchial asthma and bronchial emphysema can cause obstruction of the airways, although this is not invariable. The term chronic obstructive pulmonary disease (replacing chronic airflow limitation (CAL) and non-reversible obstructive airways disease (NROAD)) is now used as a generic term for any combination of the conditions where there is airways obstruction and a variable degree of airways hyper-reactivity.

CLINICAL MANIFESTATIONS

4. Bronchial asthma is a common condition which affects 4-10% of the population in the UK. The prevalence ad severity of bronchial asthma are rising.

5. Typical asthma attacks are characterised by shortness of breath, cough, wheeze and anxiety. The degree of breathlessness does not parallel the amount of airway constriction but is related to the acuteness of the attack. Variants occur where cough, hoarseness or inability to sleep through the night are the main symptoms rather than acute breathlessness.

6. Complications of acute bronchial asthma include pneumothorax, pneumomediastinum and respiratory failure. Chronic bronchial asthma and its therapy may lead to irreversible airways obstruction, side effects from corticosteroid therapy, bronchopulmonary aspergillosis and cor pulmonale.

7. Bronchial asthma commonly starts in childhood. In many cases where it is clinically mild, the bronchial hyper-responsiveness resolves by adolescence. On the other hand asthma may first become manifest in adult life. Of adult-onset asthmatics there are a number where close questioning reveals that the actual origin of the condition was in childhood. This is particularly so where the major symptom in youth was cough.

8. Chronic bronchial asthma can lead to irreversible airways obstruction but it does not cause emphysema.

9. The airways narrowing that constitutes an asthma attack results from obstruction of the airway lumen. Three processes are involved to variable degree. These all cause an increased resistance to airflow:

9.1. constriction of airway smooth muscle

9.2. thickening of the airway epithelium

9.3. the presence of liquids within the airway lumen.

AETIOLOGY

10. The primary cause of bronchial hyper-responsiveness in asthmatics is unknown. Current expert opinion considers that all bronchial asthma results from the interaction of both constitutional and external factors.

11. Bronchial asthma may be divided into two types, extrinsic asthma and intrinsic asthma. In extrinsic asthma environmental trigger factors are clearly identified. Intrinsic asthma is characterised by the lack of identified precipitants.

12. All asthmatics are inherently predisposed to the condition. The clinical syndrome of bronchial asthma results when a vulnerable individual meets an appropriate trigger factor. The relative importance of constitution and environmental precipitant is variable. Clinically bronchial asthma may be seen to be seasonal, occupational or persistent. In many cases this has allowed specific precipitating factors to be identified from the clinical history. There is however no evidence in adults that either constitutional or external factors acting alone cause bronchial asthma.

13. Provoking or trigger environmental factors are divided into two broad groups:

    13.1. specific antigenic factors

    13.2. non-antigen specific factors.

14. **Specific antigenic factors** play a part in seasonal and occupational asthma. They include pollens, the house dust mite, animal danders, feathers, fungal spores, metals and detergents.

15. **Non-antigen specific factors** include airway cooling (as in exercise and cold air temperatures), emotional stress, irritants (including sulphur dioxide), ingested foods, drugs and preservatives.

16. Atopy, respiratory infection and genetic factors are important in the aetiology of bronchial asthma.

17. **Atopy** is an inherited tendency to the hyperproduction of IgE antibodies to common environmental allergens. Atopic individuals are prone to asthma, hay fever and/or atopic dermatitis.

18. The majority of young asthmatics are atopic. However not all atopics have bronchial asthma and many asthmatics have no evidence of atopy. There is no evidence that the initial onset of bronchial hyper-responsiveness is due to allergic mechanisms, although in those with asthma and atopy, symptoms become worse and measured bronchial sensitivity increases on exposure to specific allergens.

19. The precise role of **respiratory infections** in the cause and course of bronchial asthma is not clear. Asthma is common in children who have had a severe viral infection before the age of 2. In addition adults with bronchial asthma frequently date the start of their asthma to an attack of acute bronchitis. There is evidence that acute infective bronchitis, particularly of viral aetiology, may itself lead to a state of bronchial hyper-reactivity. In certain susceptible people this may initiate true asthma. Both viral and bacterial infections are causes of acute exacerbations of bronchial asthma.

20. **Genetic factors**. The tendency to atopy is inherited and 80% of atopics have a family history of asthma, hay fever of eczema. There is no evidence that bronchial hyper-responsiveness itself is genetically determined.

CONCLUSION

21. The term **bronchial asthma** is used to describe a clinical syndrome where there is widespread reversible airways obstruction. The basic lesion is hyper-responsiveness of the bronchial wall smooth muscle. The cause of the condition is unknown. Both constitutional and environmental factors are known to be relevant.

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