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ASTHMA: AN OVERVIEW

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ABSTRACT
Asthma is a long-term lung condition. People with asthma have sensitive airways in their lungs which react to triggers, causing a 'flare-up'. In a flare-up, the muscles around the airway squeeze tight, the airways swell and become narrow and there is more mucus. These things make it harder to breathe. An asthma flare-up can come on slowly (over hours, days or even weeks) or very quickly (over minutes). A sudden or severe asthma flare-up is sometimes called an asthma attack. Asthma cannot be cured, but for most people it can be well controlled by following a daily management plan. Symptoms often vary from person to person, but they are most commonly breathlessness, wheezing, tight feeling in the chest and continuing cough. Symptoms often occur at night, early in the morning or during/just after activity. The causes of asthma are not fully understood, although people with asthma often have a family history of asthma, eczema and hay fever. Research has shown that exposure to tobacco smoke (especially as a baby or young child), obesity and some workplace chemicals can increase the risk of developing asthma.

KEYWORDS: Asthma is a long-term risk of developing asthma.

INTRODUCTION
Previous studies have shown that there is considerable roomfor improvement in adherence to asthma medication treatment.[1,2] Because poor adherence may reduce the likelihood of achieving and maintaining good asthma control, it isimportant that adherence to prescribed asthma medication be addressed by the health-care provider during regularfollow-up consultations.[3] Adherence may be regardedas a multifaceted behaviour that is influenced by a variety of factors, one of which is the health-care provider.[4] Asthma clinics led by specially trained asthma nurses have been shown to be effective in asthma management, for instance, in relation to adherence.[5] Moreover, the interaction between the health-care professional and the patient regarding joint treatment decisions, taken by the asthmapatient and the clinician together, seems to have a positive effect on adherence as well.[6] Another factor affectingadherence is beliefs about the asthma medication.[7,9] Individuals with asthma who, for instance, believe that their medication is necessary for their present and future health or that it prevents exacerbation of their disease are more likely to be adherent. In contrast, individuals who are concerned about their asthma medication are more inclined to deviate from the prescribed treatment.[7,8] It has also been reported that individualswith uncontrolled asthma tend to be sceptical about their asthma medication, which may cause them to choose symptom management strategies other than the medication.[10] Asthma is often studied in clinical settings, where the population of patients does not necessarily reflect individuals with asthma in general. Additionally, few studies have addressed treatment adherence, medication beliefs, and asthma control in relation to reported asthma followup consultations in individuals with asthma in the general population. It could be hypothesised that asthma follow-up consultations may have a positive influence on adherence to asthma medication treatment and medication beliefs and that adherence, medication beliefs, and asthma controlwould be associated. The aim of the present study was to investigate adherence to asthma medication treatment, medication beliefs, and asthma control in relation to asthma followup consultations in individuals with asthma in the general population. A further aim was to describe associations between adherence, medication beliefs, and asthma control.

Definition
Asthma is defined as a chronic inflammatory disease of the airways. The chronic inflammation is associated with airway hyperresponsiveness (an exaggerated airwaynarrowing response to triggers, such as allergens and exercise), that leads to recurrent symptoms such as wheezing, dyspnea (shortness of breath), chest tightness and coughing. Symptom episodes are generally

associated with widespread, but variable, airflow obstruction within the lungs that is usually reversible either spontaneously or with appropriate asthma treatment.[11]

Sigs and symptom

Asthma is characterized by recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing.[19] Sputum may be produced from the lung by coughing but is often hard to bring up.[27] During recovery from an attack, it may appear pus-like due to high levels of white blood cells called eosinophils.[28] Symptoms are usually worse at night and in the early morning or in response to exercise or cold air.[29] Some people with asthma rarely experience symptoms, usually in response to triggers, whereas others may have marked and persistent symptoms.[30]

Causes

Asthma is caused by a combination of complex and incompletely understood environmental and genetic interactions.[13,14] These factors influence both its severity and its responsiveness to treatment.[15] It is believed that the recent increased rates of asthma are due to changing epigenetics (heritable factors other than those related to the DNA sequence) and a changing living environment.[16] Onset before age 12 is more likely due to genetic influence, while onset after 12 is more likely due to environmental influence.[17]

Pathophysiology

Asthma is associated with T helper cell type-2 (Th2) immune responses, which are typical of other atopic conditions. Various allergic (e.g., dust mites, cockroach residue, furred animals, moulds, pollens) and non-allergic (e.g., infections, tobacco smoke, cold air, exercise) triggers produce a cascade of immune-mediated events leading to chronic airway inflammation. Elevated levels of Th2 cells in the airways release specific cytokines, including interleukin (IL)-4, IL-5, IL-9 and IL-13, that promote eosinophilic inflammation and immunoglobulin E (IgE) production by mast cells. IgE production, in turn, triggers the release of inflammatory mediators, such as histamine and cysteinyl leukotrienes, that cause bronchospasm (contraction of the smooth muscle in the airways), edema (swelling) and increased mucous secretion (mucous hypersecretion), which lead to the characteristic symptoms of asthma.[11,12] The mediators and cytokines released during the early phase of an immune response to an inciting allergen, trigger a further inflammatory response (late-phase asthmatic response) that leads to further airway inflammation and bronchial hyperreactivity.[12] Evidence suggests that there may be a genetic predisposition for the development of asthma. A number of chromosomal regions associated with asthma susceptibility have been identified, such as those related to the production of IgE antibodies, expression of airway hyperresponsiveness, and the production of inflammatory mediators. However, further study is required to determine specific genes involved in asthma as well as the gene-environment interactions that may lead to expression of the disease.[11]

Diagnosis

While asthma is a well-recognized condition, there is not one universal agreed upon definition.[18] It is defined by the Global Initiative for Asthma as "a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role. The chronic inflammation is associated with airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing particularly at night or in the early morning. These episodes are usually associated with widespread but variable airflow obstruction within the lung that is often reversible either spontaneously or with treatment".[19]

There is currently no precise test for the diagnosis, which is typically based on the pattern of symptoms and response to therapy over time.[20,18] A diagnosis of asthma should be suspected if there is a history of recurrent wheezing, coughing or difficulty breathing and these symptoms occur or worsen due to exercise, viral infections, allergens or air pollution.[21] Spirometry is then used to confirm the diagnosis.[21] In children under the age of six the diagnosis is more difficult as they are too young for spirometry.[22]

Spirometry

Spirometry is recommended to aid in diagnosis and management.[23,24] It is the single best test for asthma. If the FEV1 measured by this technique improves more than 12% and increases by at least 200 milliliters following administration of a bronchodilator such as salbutamol, this is supportive of the diagnosis. It however may be normal in those with a history of mild asthma, not currently acting up.[18] As caffeine is a bronchodilator in people with asthma, the use of caffeine before a lung function test may interfere with the results.[25] Single-breath diffusing capacity can help differentiate asthma from COPD.[21] It is reasonable to perform spirometry every one or two years to follow how well a person's asthma is controlled.[26]

Classification

Asthma is clinically classified according to the frequency of symptoms, forced expiratory volume in one second (FEV1), and peak expiratory flow rate.[31] Asthma may also be classified as atopic (extrinsic) or non-atopic (intrinsic), based on whether symptoms are precipitated by allergens (atopic) or not (non-atopic).[32] While asthma is classified based on severity, at the moment there is no clear method for classifying different subgroups of asthma beyond this system.[33] Finding ways to identify subgroups that respond well to different types of treatments is a current critical goal of asthma research.[33]

Although asthma is a chronic obstructive condition, it is not considered as a part of chronic obstructive

pulmonary disease, as this term refers specifically to combinations of disease that are irreversible such as bronchiectasis, chronic bronchitis, and emphysema.[34] Unlike these diseases, the airway obstruction in asthma is usually reversible; however, if left untreated, the chronic inflammation from asthma can lead the lungs to become irreversibly obstructed due to airway remodeling.[35] In contrast to emphysema, asthma affects the bronchi, not the alveoli.[36]

Medications

Medications used to treat asthma are divided into two general classes: quick-relief medications used to treat acute symptoms; and long-term control medications used to prevent further exacerbation.[37] Antibiotics are generally not needed for sudden worsening of symptoms.[38]

Fast–acting

- Short-acting beta2-adrenoceptor agonists (SABA), such as salbutamol (*albuterol* USAN) are the first line treatment for asthma symptoms.[39] They are recommended before exercise in those with exercise induced symptoms.[40]
- Anticholinergic medications, such as ipratropium bromide, provide additional benefit when used in combination with SABA in those with moderate or severe symptoms.[39] Anticholinergic bronchodilators can also be used if a person cannot tolerate a SABA.[34] If a child requires admission to hospital additional ipratropium does not appear to help over a SABA.[41]
- Older, less selective adrenergic agonists, such as inhaled epinephrine, have similar efficacy to SABAs.[42] They are however not recommended due to concerns regarding excessive cardiac stimulation.[43]

Long–term control

- Corticosteroids are generally considered the most effective treatment available for long-term control.[37] Inhaled forms such as beclomethasone are usually used except in the case of severe persistent disease, in which oral corticosteroids may be needed.[37] It is usually recommended that inhaled formulations be used once or twice daily, depending on the severity of symptoms.[44]
- Long-acting beta-adrenoceptor agonists (LABA) such as salmeterol and formoterol can improve asthma control, at least in adults, when given in combination with inhaled corticosteroids.[45][46] In children this benefit is uncertain.[45][46] When used without steroids they increase the risk of severe side-effects,[47] and with corticosteroids they may slightly increase the risk.[48][49] Evidence suggests that for children who have persistent asthma, a treatment regime that includes LABA added to inhaled corticosteroids may improve lung function but does not reduce the amount of serious exacerbations.[50] Children who require LABA as part of their asthma treatment may need to go to the hospital more frequently.[50]
- Leukotriene receptor antagonists (such as montelukast and zafirlukast) may be used in addition to inhaled corticosteroids, typically also in conjunction with a LABA.[37][52] Evidence is insufficient to support use in acute exacerbations.[53][54] In children they appear to be of little benefit when added to inhaled steroids,[55] and the same applies in adolescents and adults.[56] They are useful by themselves.[57] In those under five years of age, they were the preferred add-on therapy after inhaled corticosteroids by the British Thoracic Society in 2009.[58] A similar class of drugs, 5-LOX inhibitors, may be used as an alternative in the chronic treatment of mild to moderate asthma among older children and adults.[59][51] As of 2013 there is one medication in this family known as zileuton.[59]
- Intravenous administration of the drug aminophylline does not provide an improvement in bronchodilation when compared to standard inhaled beta-2 agonist treatment.[60] Aminophylline treatment is associated with more adverse effects compared to inhaled beta-2 agonist treatment.[60]
- Mast cell stabilizers (such as cromolyn sodium) are another non-preferred alternative to corticosteroids.[37]

Delivery method

Medications are typically provided as metered-dose inhalers (MDIs) in combination with an asthma spacer or as a dry powder inhaler. The spacer is a plastic cylinder that mixes the medication with air, making it easier to receive a full dose of the drug. A nebulizer may also be used. Nebulizers and spacers are equally effective in those with mild to moderate symptoms. However, insufficient evidence is available to determine whether a difference exists in those with severe disease.[61] There is no strong evidence for the use of intravenous LABA for adults or children who have acute asthma.[62]

Adverse effects

Long-term use of inhaled corticosteroids at conventional doses carries a minor risk of adverse effects.[63] Risks include thrush, the development of cataracts, and a slightly slowed rate of growth.[63][64][65] Higher doses of inhaled steroids may result in lower bone mineral density.[66]

CONCLUSION

If anyone recurrently experience shortness of breath or you hear a whistling or wheezy sound in your chest when you breathe, you may have asthma - a chronic condition that reasons inflammation and narrowing of the bronchial tubes (the passage ways that allow air to enter and leave the lungs). If people with asthma are exposed to a substance to which they are sensitive or a situation that changes their regular breathing patterns, the symptoms can become further severe. Asthma symptoms affect an

estimated 26 million Americans - 19 million adults and 7 million children — and are one of the chief causes of absences from work and school. Asthma often runs in families; according to the World Health Organization, about half the cases are due to genetic susceptibility and half result from environmental factors. Though there is no cure for asthma, effective treatments are available. Asthma can be finest managed by seeing an allergist. There are two types of asthma: allergic (begun by exposure to an allergen) and nonallergic (triggered or started by stress, exercise, illnesses like a cold or the flu, or exposure to extreme weather, irritants in the air or some medications).

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