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Review Article

Review Article On Asthama

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Asthma is a chronic respiratory condition that causes inflammation and narrowing of the airways, making it difficult to breathe. Symptoms include: wheezing, coughing, shortness of breath, chest tightness, and rapid breathing.

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ABSTRACT

Asthma-one of the most common chronic, non-communicable diseases in children and adults-is characterised by variable respiratory symptoms and variable airflow limitation. Asthma is a consequence of complex gene-environment interactions, with heterogeneity in clinical presentation and the type and intensity of airway inflammation and remodelling. The goal of asthma treatment is to achieve good asthma control-ie, to minimise symptom burden and risk of exacerbations. Anti-inflammatory and bronchodilator treatments are the mainstay of asthma therapy and are used in a stepwise approach. Pharmacological treatment is based on a cycle of assessment and re-evaluation of symptom control, risk factors, comorbidities, side-effects, and patient satisfaction by means of shared decisions. Asthma is classed as severe when requiring high-intensity treatment to keep it under control, or if it remains uncontrolled despite treatment. New biological therapies for treatment of severe asthma, together with developments in biomarkers, present opportunities for phenotype-specific interventions and realisation of more personalised treatment. In this Seminar, we provide a clinically focused overview of asthma, including epidemiology, pathophysiology, clinical diagnosis, asthma phenotypes, severe asthma, acute exacerbations, and clinical management of disease in adults and children older than 5 years. Emerging therapies, controversies, and uncertainties in asthma management are also discussed.

INTRODUCTION

Asthma is a chronic condition that affects the airways. It causes wheezing and breathing difficulties. There are different types, such as childhood, adult-onset, seasonal, and workplace-related asthma. Asthma causes the inside walls of the airways, or the bronchial tubes, to become

swollen and inflamed. Asthma is a chronic lung disease affecting people of all ages. It is caused by inflammation and muscle tightening around the airways, which makes it harder to breathe. Symptoms can include coughing, wheezing, shortness of breath and chest tightness. These

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symptoms can be mild or severe and can come and go over time. Asthma is one of the most common chronic diseases of childhood, affecting more than 6 million children. Asthma is a chronic inflammatory lung disease that can cause repeated episodes of cough, wheezing and breathing difficulty. During an acute asthma episode, the airway lining in the lungs becomes inflamed and swollen. In addition, mucus production occurs in the airway and muscles surrounding the airway spasm. Combined, these cause a reduction in air flow. This respiratory condition is characterized by inflammation of the airways, causing intermittent airflow obstruction & bronchial hyper responsiveness. The hallmark asthma symptoms include coughing, wheezing, and shortness of breath, which can be frequently exacerbated by triggers ranging from allergens to viral infections. The prevalence and severity of asthma are determined by a complex interplay between genetic and environmental factors. Despite treatment advancements, disparities persist in asthma care, with variations in access to diagnosis, treatment, and patient education across different demographics. During an asthma attack the airways swell the muscles around them tighten becomes difficult for air to move in and out of the lungs.

You Will Never Know Just How Much You Value Breath Until You Cant Breath.

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asthma, acute exacerbations, and clinical management of disease in adults and children older than 5 years. Emerging therapies, controversies, and uncertainties in asthma management are also discussed.

Causes :-

Asthma is caused by inflammation of the breathing tubes, which makes them more sensitive and prone to narrowing. Asthma can be caused by a number of factors, including:

- Allergens: These substances can include dust mites, mold, pet dander, pollen, and waste from pests.
- Non-allergens: These triggers include cold air, certain medicines, household chemicals, infections, outdoor air pollution, and tobacco smoke.
- Occupational asthma: This is caused by breathing in chemicals or industrial dusts at work.
- Exercise-induced asthma: This occurs during physical exercise, especially when the air is dry.
- Gastroesophageal reflux disease (GERD): Patients with asthma are three times more likely to also have GERD.
- Genetics: Your genes, race, and sex can all play a role in whether you develop asthma.

Symptoms:-

A person living with asthma :-

- tightness in the chest.
- Wheezing.
- Breathlessness.
- Coughing.
- increased mucus production.

An asthma attack occurs when the symptoms become severe. Attacks can begin suddenly and range from mild to life threatening.

Types:-

Asthma can develop in many different ways and for many different reasons, but the triggers are



often the same. They can include several broad categories, such as:

- allergens, including dander and pollen.
- irritants, such as smoke and chemicals.
- Exercise.
- other health conditions.
- Weather.
- certain medications.
- Allergic asthma.
- Aspirin-induced asthma.
- Cough-variant asthma.
- Exercise-induced asthma.
- Nighttime asthma.
- Steroid-resistant asthma.
- Occupational asthma.
- strong emotions.

Child Asthma :-

Asthma is the most common chronic condition in children. It can develop at any age, but it is slightly more common in children than in adults.

In 2019, children aged 12–14 years were most likely to experience asthma. In this age group, the condition affected 10.8% Trusted Source of individuals. The second highest prevalence was in children aged 5–14 years, with an average of 9.1%. In the same year, asthma developed in 8% of people aged 18 years or over.

Adult Asthma :-

Asthma can develop at any age, including during adulthood.

- When a doctor makes a diagnosis of asthma in people older than age 20, it is known as adult-onset asthma.
- Among those who may be more likely to get adult-onset asthma are:
 - Women who are having hormonal changes, such as those who are pregnant or who are experiencing menopause
 - Women who take estrogen following menopause for 10 years or longer.

- People who have just had certain viruses or illnesses, such as a cold or flu.
- People with allergies, especially to cats.
- People who have GERD, a type of chronic heartburn with reflux.
- People who are exposed to environmental irritants, such as tobacco smoke, mold, dust, feather beds, or perfume.

Risk Factor:-

- Having a blood relative with asthma, such as a parent or sibling.
- Having another allergic condition, such as atopic dermatitis — which causes red, itchy skin — or hay fever — which causes a runny nose, congestion and itchy eyes.
- Being overweight.
- Being a smoker.
- Exposure to secondhand smoke.

Natural Drug :-

Some herbs and foods may alleviate asthma symptoms by reducing inflammation, combatting oxidative stress, and boosting the immune system. These include turmeric, ginseng, and garlic. It is best to contact a doctor before using any herbal or home remedies.

DRUG USED EXAMPLE :- Albuterol .

Treatment :-

Yellow zone:

The yellow zone of an asthma action plan is having moderate asthma symptoms and a peak flow reading of 50% to 79% of your personal best. If you're in the yellow zone, the plan will tell you how many puffs of your quick-relief medicine to take and how often you can repeat the dose. Young children or people who have difficulty with an inhaler use a device called a nebulizer to inhale the medicine in a mist.

Quick-relief medicines include:

- Albuterol (ProAir HFA, Proventil-HFA, Ventolin HFA, others).
- Levalbuterol (Xopenex, Xopenex HFA).



The yellow zone of the plan also will tell you:

- When to take another dose of the quick-relief medicine.
- When to take a pill called an oral corticosteroid to treat inflammation.
- Whether to call your healthcare professional.

Your healthcare professional may tell you whether to take additional doses or change doses of a medicine. You'll likely get instructions about monitoring your symptoms. You may be instructed to go to the clinic or emergency room.

Red zone:

The red zone in an asthma action tells you to get emergency care if:

- You are very short of breath.
- The symptoms get worse.
- You're still in the yellow zone after 24 hours.
- You can't do typical activities.
- You have a peak flow below 50%.
- Your healthcare professional tells you to go.

Emergency treatment

If you go to the emergency room for an asthma attack in progress, you'll likely get a number of treatments to restore regular breathing. Treatments may include:

- **Oxygen.** Oxygen may be given through a tube attached to the nose if there are signs of too little oxygen in the blood.
- **Quick-relief medicines.** Inhaled quick-relief medicines, such as albuterol and levalbuterol, are given either with an inhaler or a nebulizer to open airways.
- **Ipratropium (Atrovent HFA).** Ipratropium is a drug also used to open airways that is inhaled with an inhaler or a nebulizer.
- **Corticosteroids.** Corticosteroids are given as a pill or shot to treat inflammation.
- **Mechanical ventilation.** If an asthma attack is life-threatening, a machine may be used to help you breathe and get extra oxygen. This may be done with a breathing mask. But in

some cases, a tube is placed down the throat and into the windpipe. This procedure is called intubation. You will be in the emergency room or in the hospital for observation or treatment until you are breathing regularly for some time.

Medication :- Controller medications are the most important because they prevent asthma attacks. When you use these drugs, your airways are less inflamed and less likely to react to triggers.

Quick-relief medications -- also called rescue medications -- relax the muscles around your airway. If you have to use a rescue medication more than twice a week, your asthma isn't well-controlled. But people who have exercise-induced asthma may use a quick-acting medication called a beta-agonist before a workout.

QUICK-RELIEF ASTHAMA DRUG :-

Short-acting beta-agonists (bronchodilators)

Anticholinergics. Bronchodilators that can be paired with, or used instead of, short-acting beta-agonists.

Systemic corticosteroids. Anti-inflammatory drugs that get symptoms under control.

Diagnosis:-

A child is more likely to have asthma if:

- A parent has asthma
- The child has allergies, including the allergic skin condition eczema
- Exposed to tobacco smoke during pregnancy or throughout childhood
- Exposed to indoor and outdoor air pollutants
- The child wheezes with viral infection
- The child is obese

To help your child's healthcare provider make a correct diagnosis, be prepared to provide information about family history of asthma or allergies, the child's overall behavior, breathing patterns and responses to foods or possible allergy triggers. Lung function tests are often used to make an asthma diagnosis, but they are very



hard to do with young children. The doctor may use a 4- to 6-week trial of asthma medicines to see if they make a difference in your child's symptoms.

Lifestyle Changes :-

- **Weight**

Being overweight can make asthma harder to manage. Even a small amount of weight loss can help.

- **Diet**

Eat a healthy, anti-inflammatory diet with more fruits, vegetables, and whole grains, and less saturated fat. You can also try taking an anti-inflammatory supplement, such as curcumin, essential fatty acids, or a multivitamin.

- **Exercise**

Regular physical activity can improve lung function and quality of life. However, exercise can trigger asthma for some people, so talk with your provider about what level of activity is right for you.

- **Stress**

Stress can worsen asthma symptoms, so try to manage it with breathing and relaxation techniques.

- **Sleep**

Develop healthy sleep habits, such as going to bed and waking up at the same time every day, and keeping your bedroom cool and dark.

Mechanism Of Action :-

An important component of asthma, accounting for most of the disease morbidity and mortality, is the exacerbation in which deterioration in disease control occurs over several days. After establishing PCR-based detection methods for human rhinoviruses (RV), we used longitudinal cohorts to first establish the importance of respiratory viruses in causing asthma exacerbations both in children (>85%)¹⁶ and in adults (>65%)¹⁷ with RV major and minor subtypes dominating. Controlled nasal infection of asthmatics with RV16 revealed a

mixed eosinophilic and lymphocyte (CD4⁺ and CD8⁺) airways inflammation of the lower airways in association with increased bronchial hyperresponsiveness which returned to baseline during convalescence.

Pathophysiology :-

Asthma is usually mediated by immunoglobulin E (IgE) and precipitated by an allergic response to an allergen. IgE is formed in response to exposure to allergens such as pollen or animal dander¹⁴. Sensitisation occurs at first exposure, which produces allergen-specific IgE antibodies that attach to the surface of mast cells. Upon subsequent exposure, the allergen binds to the allergen-specific IgE antibodies present on the surface of mast cells, causing the release of inflammatory mediators such as leukotrienes, histamine and prostaglandins. These inflammatory mediators cause bronchospasm, triggering an asthma attack.

CONCLUSION :-

Asthma is a chronic respiratory disease that requires ongoing management to prevent symptoms and exacerbations. The proper treatment and lifestyle modifications, people with asthma can lead active and healthy lives.

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