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LOKNETE SHREE DADA PATIL PHARATE COLLEGE OF PHARMACY MANDAVGAON PHARATA

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ABSTRACT

Asthma is an obstructive lung disease affecting 230 million people worldwide and a significant cause of morbidity in patients of all ages. It is a heterogeneous disease with a complex pathophysiology and phenotype. Diagnosis is made with thorough history-taking and physical examination, and the condition is characterised by variable airflow obstruction and airway hyper-responsiveness. Understanding the severity of the disease is important, and treatment is aimed at symptom control and the prevention of future exacerbations. Pharmacologic treatment with beta-agonists for intermittent asthma and inhaled corticosteroids and a combination of inhaled corticosteroids and long-acting beta-2 agonists for persistent asthma are recommended. Additional and alternative treatments with leukotriene modifiers, anticholinergics, biologics, and bronchial thermoplasty are also available. However, understanding an individual's disease phenotype, endotype, and comorbidities is necessary for asthma treatment, with appropriate consultation with asthma specialists required for those with severe asthma.

LITERATURE REVIEW

Our understanding of asthma and its therapy has changed markedly over the last few years, particularly with the application of molecular and cell biology and the discovery of new and more specific pharmacological tools. 2 Many inflammatory cells participate in the inflammatory process in asthma and mediate a complex mixture of mediators. Cytokines are of particular importance as mediators of chronic inflammation and the means by which cytokines amplify and perpetuate the inflammatory process is now emerging. Airway epithelial cells may be a particularly important source of cytokines and other mediators, such

as nitric oxide and endothelin, and may be a major target cell for inhaled steroids, which are the most effective therapy for asthma currently available. 3 The inflammatory process in asthma results not only in bronchoconstriction, but also plasma exudation, the activation of neural mechanisms, mucus secretion. The chronic inflammation may lead to structural changes, including an increase in airway smooth muscle and fibrosis, that are essentially irreversible. There is increasing evidence that transcription factors, such as NF-kB, play a pivotal role in the expression of inflammatory genes in asthma and may be the major molecular target for glucocorticoids

Epidemiology

The recent substantial increase in the report prevalence of asthma worldwide has led to numerous studies of the prevalence and characteristics of this condition. Foremost among these are 2 major international initiatives that have collected data using validated questionnaires, one among children, the International Study of Asthma and Allergies in Childhood, 3 and the other among young adults, the European Community Respiratory Health Survey.4 Follow-up investigations for both of these studies 5,6 have examined temporal trends within and across populations. During a mean of 7 years following phase I of the International Study of Asthma and Allergies in Childhood, which in most participating countries was conducted between 1991 and 1993, the prevalence of asthma was stable or decreased in some areas of the world but increased substantially in many other areas, especially among children 13–14 years of age.

INTRODUCTION

Asthma is a disorder of the respiratory system that leads to episodic difficulty in breathing It is a chronic inflammatory disorder of the airways in which many cells cellular elements play a role, in particular, mast cells, eosinophils, T lymphocytes, macrophages, neutrophils and epithelial cells.

In susceptible individuals this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness and coughing.

These are usually associates with variable airflow obstruction that is often reversible.

HISTORY

The word "asthma" originates from the Greek meaning short of breath, meaning that any

patient with breathlessness was asthmatic. The term was refined in the latter part of the 19th Century with the publication of a treatise by Henry Hyde Salter entitled "On Asthma and its Treatment" This is a 35-year-old male with a past medical history of asthma, atopic dermatitis, allergic rhinitis, gastroesophageal reflux and food allergy presenting with severe asthma not well controlled with controller therapy.

In the past month, patient reported chest tightness, shortness of breath and wheeze multiple times a day. He had one episode of nighttime awakening from his asthma in the past month.

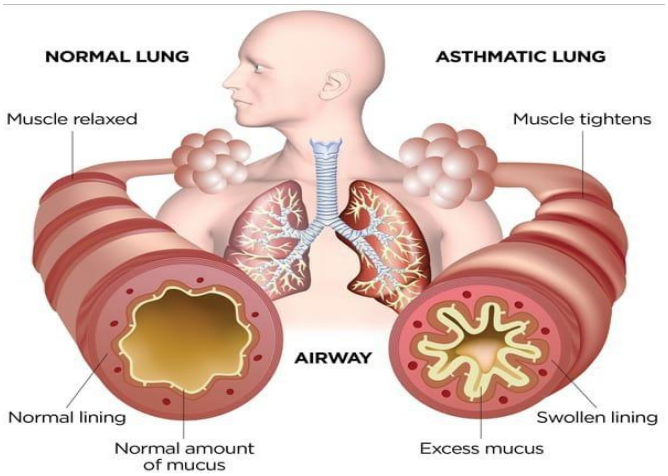
Patient was taking albuterol nebulizer treatment or ipratropium- albuterol nebulizer treatment four to seven times a day. In addition, he was taking fluticasone-vilanterol (BREO ELLIPTA) 200-25 µg/dose inhalation one puff once a day and tiotropium bromide (Spiriva Respimat) two puffs once a day. Patient reported adherence to controller medications.

Content

Asthma

A chronic inflammatory disorder of the airways... in susceptible individuals, inflammatory symptoms are usually associated with widespread but variable airflow obstruction and an increase in airway response to a variety of stimuli.

Obstruction is often reversible, either spontaneously or with treatment.



Allergic asthma

- Aspirin-induced asthma.
- Cough-variant asthma.
- Exercise-induced asthma.

- Nighttime asthma.
- Steroid-resistant asthma.
- Occupaional asthma

1] Allergic asthma

Asthma triggered by exposure to the same substances that trigger allergy symptoms.

An allergy is when the immune system mistakes a harmless substance, such as pollen, as dangerous. The body releases chemicals to attack the substance.

Symptoms

An allergy affecting the lungs can lead to asthma symptoms such as wheezing and difficulty breathing.

For informational purposes only. Consult your local medical authority for advice.Sources: Apollo Hospitals and others.

Tratment

Inhaled corticosteroids (beclomethasone, budesonide, ciclesonide, fluticasone, mometasone) are effective long-term asthma control medication.

2] Aspirin-induced asthma

Aclinical syndrome characterized by chronic rhinosinusitis and asthma precipitated by ingestion of aspirin and other nonsteroidal anti-inflammatory drugs. The syndrome is also frequently associated with nasal polyposis sneezing, a runny or stuffy nose, andredness, warmth of the face.

Treatment

Managing aspirin-induced asthma involves typical asthma treatment methods. This includes inhaled corticosteroids, like in other types of asthma. It also includes drugs called leukotriene receptor agonists.

These drugs block the action of leukotrienes

1] *Cough-variant asthma*

Cough-variant asthma is a type of asthma where a dry cough is your only symptom. You don't have “traditional” asthma symptoms, like shortness of breath or wheezing. Exercise, cold air and weather

changes may trigger it. It's manageable with asthma treatment, like inhalers.

Symptoms

Dry cough

Treatment

Short-acting bronchodilators. These are rescue inhalers that quickly open up your airways during a sudden attack....

Inhaled corticosteroids (ICS). These reduce inflammation and mucus.... Leukotriene receptor antagonists (like montelukast)....

Long-acting bronchodilators.

2] Exercise-induced asthma

when the airways narrow or squeeze during hard physical activity. It causes shortness of breath, wheezing, coughing, and other symptoms during or after exercise. The medical term for this condition is exercise-induced bronchoconstriction.

Symptoms

Chest tightness, wheezing, coughing, and dyspnea.

3] *Nighttime asthma.*

When the airways narrow or squeeze at night is called nighttime asthma.

Symptoms

Coughing fits, tightness in the chest, wheezing and shortness of breath just before and during sleep.

Treatment

Inhaled steroids are very effective.

4] Steroid-resistant asthma

Corticosteroid resistant asthma is defined as less than 15% improvement in baseline FEV1 after 14 days course of oral prednisolone (40 mg/day) in patients who demonstrate more than 15% improvement in FEV1 following the inhaled β2 agonist, Salbutamol.

Symptoms

cigarette smoking, respiratory viral and bacterial infections, high-fat diet and/or obesity,

Treatment

Maximise combination (Long acting β2 agonist or Theophylline) therapy, assessment and correction of vitamin D deficiency, control and treatment of obesity, cessation of smoking etc may improve steroid responsiveness. The above steps are helpful in type 1 steroid resistant asthma.

5] *Occupational asthma*

Occupational asthma is a lung disorder in which substances found in the workplace cause the airways of the lungs to swell and narrow.

Symptoms wheezing, shortness of breath, runny nose, nasal congestion, eye irritation, and chest tightness.

Treatment

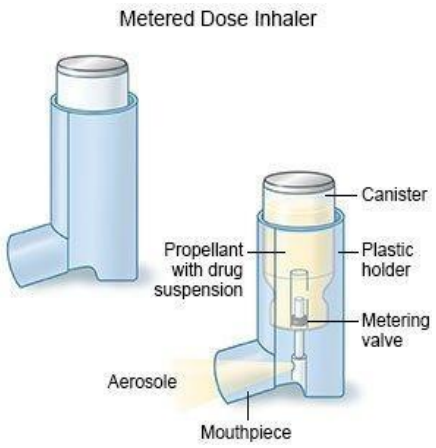
Includes avoiding the substance that triggers the asthma attack or symptoms. Persons with occupational asthma should also avoid inhaling gases, such as chlorine, or nitrogen dioxide, and sulfur dioxide, as these substances can make asthma symptoms more severe.

Inhalers Used To Treat Asthma

- Metered-dose inhalers
- Dry powder inhalers
- Combination inhalers

1] Metered-dose inhalers

A metered-dose inhaler is a device that delivers a specific amount of medication to the lungs, in the form of a short burst of aerosolized medicine that is usually self-administered by the patient via inhalation.



2] Dry powder inhalers

Dry-powder inhaler is a device that delivers medication to the lungs in the form of a dry powder. DPIs are commonly used to treat respiratory diseases such as asthma, bronchitis, emphysema and COPD although DPIs have also been used in the treatment of

Dry powder inhalers

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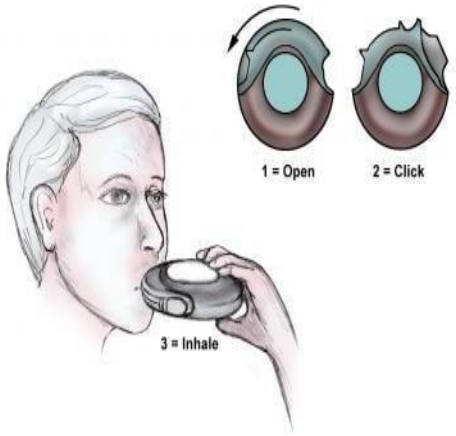
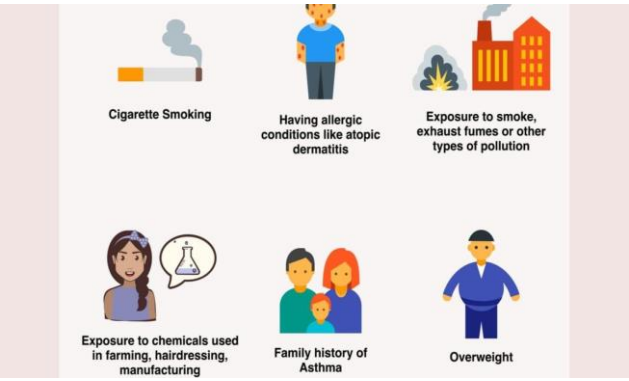


3] Combination inhalers

An asthma combination inhaler combines two kinds of medicine in one device: a corticosteroid preventer and a long-acting bronchodilator. The preventer medicine keeps down inflammation in your airways. The long-acting bronchodilator medicine gives ongoing relief from symptoms such as breathlessness and a tight chest.

RISK FACTORS



SUMMARY

Asthma is characterized by reversible bronchoconstriction caused by airway hyper-responsiveness to a variety of stimuli.

- Atopic asthma is caused by a TH2 and IgE-mediated immunologic reaction to environmental allergens and is characterized by acute (immediate) and late-phase reactions. The TH2 cytokines IL-4, IL-5, and IL-13 are important mediators.
- Triggers for non-atopic asthma are less clear but include viral infections and inhaled air pollutants.
- Eosinophils are key inflammatory cells found in all subtypes of asthma; eosinophil products such as major basic protein are responsible for airway damage.
- Airway remodeling (basement membrane thickening and hypertrophy of bronchial smooth muscle) adds to the element of obstructive disease.

CONCLUSION

Asthma is a heterogeneous disease affecting millions of people worldwide. It is characterised by airway hyper-responsiveness and airway inflammation with variable airflow obstruction. Understanding the various phenotypes and pathophysiologies and providing individualized treatment that is suited to the patient's comorbidities and lifestyle is important in the management.

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