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Asthma Management

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Review Article

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ABSTRACT

Asthma may be a common chronic unwellness with inflammation of the airway. Advances in science have light-emitting diode to accumulated understanding of the heterogeneous nature of asthma attack and its complicated mechanisms. Historically, asthma attack-practice tips have targeted on optimizing respiratory organ operate and also the USA government agency has needed will increase in respiratory organ operate and reduction of exacerbation as primary outcomes in clinical trials of latest asthma medicine. Improved respiratory organ operate may be an important indicator of medicament medical aid, however the importance of long asthma attack management whereas maintained on controller medication is more and more stressed. The bureau asthma attack tips recommend the utilization of patient-reported outcomes, together with health-related quality-of-life measures, to assess asthma attack management. Clinical practices and analysis studies regarding asthma attack will have the benefit of harmonizing the most important outcome measures in order that comparisons across studies are often created.

INTRODUCTION

Asthma is a chronic inflammatory disease more common in infants and children those are sensitive to allergens and have increased responsiveness of trachea and bronchi to various stimuli. High exposure to dust mites can also cause symptoms of asthma in infants [1]. Children with difficulty in breathing may have one or more forms of asthma. Asthmatic children often have less stamina compared to other children, or often avoid physical activities. Asthma in children is not a different disease from that in adults but it offers unique challenges to the health care professionals, parents and the children [2]. The increasing numbers of asthma cases have been forcing to develop the emergency services, lead to changes in normal life of an individual and hospitalization for several days. Asthma can be life-threatening if not managed properly. Statistics suggest that majority of the asthma cases include children of less than 18 years old. So, in this regard there is a need for prompt action in order to reduce the prevalence of asthma in children [3]. Current estimations suggest that 300 million people worldwide suffer from Bronchial Asthma and in addition 100 million may be diagnosed with Bronchial Asthma by 2025 [4]. 3.7 to 8.4 percent of pregnant women are estimated to have asthma.

CAUSES

There are many causes for Asthma which differs from children to children and are identified as various allergens, viruses, bacteria, pollutants, sensitizers and other occupational irritants [5].Another study convinced that the increase in wind speed and the eventual spread of the local air-borne pollen results in increased number of patients. Increase in the values of daily relative humidity leads to the development asthmatic symptoms in children [6]. Asthma in some patients can be airborne due to allergen like the house dust mite in the domestic environment [7]. Airflow obstruction in asthma is caused

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by constriction of bronchial smooth muscles and infiltration of leukocytes that fill the airways and induce epithelial damage and desquamation into the lumen of the airways [8].

Increasing consumption of tobacco and other drugs like cannabis by the youngsters in India and other western countries has also been leading to the increased number of asthma cases as suggested by various studies to know the causes of asthma [9]. Obesity may cause incident asthma whereas in other cases obesity alters pre-existing asthma to be more difficult to control and complicates its management, partly because of blunted effectiveness of inhaled corticosteroids [10]. Tuberculosis can also leads to asthma in some patients who have inhaled Cryptococcus. Because of the bronchial asthma and chronic airway obstruction and due to prolonged corticosteroid therapy the Cryptococci may take the advantage of disturbed pulmonary function and responsible for acute exacerbation leading to respiratory failure [11]. Food allergy can be involved in bronchial asthma, allergic rhinitis etc. [12]. More than 30% of patients with allergic rhinitis also suffer from allergic asthma [13]. More than 90% of children with asthma develop sensitization to specific IgE from house dust mite allergens. Hence, dust mite allergy is strongly associated with asthma [14]. Airway inflammation which is the main feature in asthma is caused due to the most prominent inflammatory cell eosinophil, with mast cells, lymphocytes, and macrophages [15,16].

SYMPTOMS

Asthma symptoms vary person to person and are situational as follows:

Exercise-induced asthma

Exercise does not cause asthma, but in some people it is a frequently occurring asthma trigger.

Irritant-induced Occupational asthma

When a person inhales a very high concentration of an irritant gas, vapor or fume causes nonspecific airway hyper responsiveness.

Allergy-induced asthma

Pet dander, cockroaches or pollen allergens triggers the symptoms of allergy-induced asthma [17].

Exposure to pollen allergens and bad air quality is an important trigger for asthma [18]. Symptoms can be seen in the children under age 5. Dyspnea, cough, chest tightness and wheezing are the major symptoms of Asthma in children apart from airway inflammation and hyper responsiveness [19]. Sometimes symptoms can be life threatening such as gasping for air, breathing in so hard that the abdomen is sucked under the ribs and trouble speaking because of restricted breathing [11].

In spite of several recent advancements and improvements in medical sciences to treat pediatric asthma the number of asthma cases in infants and children are uncontrollable [20]. Sometimes they complain the problems that their chest hurts or they can't catch their breath. Colds may go straight to their chest. Or, they may cough when sick, particularly at night. Exercise Induced Bronchoconstriction (EIB) is narrowing of the airways is one of the causes of asthma. Asthma and Chronic Obstructive Pulmonary Disease (COPD) are interlinked in which air flow obstruction is the common symptom [21]. In case of chronic asthma, formation of nasal polyps are observed which are not dangerous but cause blockage of normal drainage from the sinuses [22,41]. The association between asthma and chronic rhino sinusitis with nasal polyps is more frequent in patients with higher tissue eosinophilia and the disease is more severe, both in the upper and lower airways [23]. Chronic neutrophilic inflammation is associated with asthma [24] and is more prevalent in patients with asthma who smoke or have severe asthma judged by pulmonary function [25].

MANAGEMENT

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Asthma can be managed efficiently by two therapies that are pharmacotherapy and non-pharmacotherapy. Pharmacotherapy includes long-term control oral and inhaled medication like bronchodilators, mast cell stabilizers, corticosteroids, β-agonists, leukotriene modifiers and immunotherapy [26]. Non-pharmacotherapy techniques include Yogic techniques i.e., Asana (Physical exercises) and Pranayama (Breathing exercises) [27]. Quick-relief (rescue) medications includes short-acting beta agonists, ipratropium (Atrovent), Oral and intravenous corticosteroids [28]. Maintenance of regular pulmonary function, maintenance of usual physical activity, prevention of the cough or wheezing with minimal chronic symptoms and avoiding adverse consequence of medication are the primary goals of management of asthma [29].

Omalizumab an anti-IgE monoclonal antibody is the first biologic immunoregulatory agent available to treat asthma. It acts by binding to the portion of IgE that recognizes its receptor on the surface of mast cells and basophils and, when given intravenously, reduces circulating IgE levels by 95% [30]. And reduces sensitivity to inhaled or ingested allergens, especially in the control of moderate to severe allergic asthma, which does not respond to high doses of corticosteroids. Omalizumab has been approved for treating moderate to severe allergic asthma in adult and older with in more than 90 countries [31,32].

Recent studies revealed that there exists a relation between weight management and control of asthma both in adult and pediatric patients. Increasing weight and risk of asthma are in direct relation. However, weight loss alone cannot contribute to the improvement of asthmatic condition and combined effects of diet control and increased physical activity help better in improving the asthma outcomes [33]. Allergens induced asthma in the patients can be treated using specific immunotherapy (SIT). The treatment involves the mechanism of inducing peripheral T-cell tolerance and activation of regulatory T-cells. This kind of treatment reduces the risk of side effects and will be long lasting even after the treatment [34]. Inhaled corticosteroid (ICS) is currently regarded as the mainstay of asthma management and its introduction resulted in a decrease of asthma death. Transdermal administration could be regarded as the third route of steroid therapy for asthmatic cough though less effective compared to inhaled corticosteroid therapy [35]. Application of adrenergic agonists and antagonists in the diseased with bronchial asthma does not change the activity of alpha-1 adrenergic receptors in the airways smooth musculature [36]. The supplementation of fish oil reduces exercise induced bronchoconstriction in athletes with asthma [37].

Long and short-acting beta-2 adrenergic agonists, inhaled corticosteroids, and leukotriene inhibitors, in addition to a variety of combination products are used to treat asthma in both children and adults [38]. Inhaled medications reduce asthma symptoms to a greater extent in many asthma cases. For better control of their disease state patients must utilize a combination of multiple inhalers, nebulizer devices, and sometimes even the addition of oral medications [39]. Management of asthma can be improved by the treatment of allergic rhinitis, symptomatic gastro esophageal reflux disease (GERD), vocal cord dysfunction, obstructive sleep apnea, obesity, anxiety and depression [40]. World Health Organization proposes to differentiate two categories: difficult-to-treat-severe asthma (DTTSA) and treatment-resistant-severe asthma (TRSA). DTTSA includes controllable severe asthma and TRSA includes patient's not achieving adequate levels of control [41]. Nasal polyps can be treated by spraying of nasal steroids into the nose that can reduce your runny nose and the sensation of blockage by shrinking the polyp. Examples include fluticasone, budesonide, and mometasone [40]. Asthma in pregnant women is to provide optimal therapy to maintain control of it for maternal health and quality of life as well as for normal fetal maturation [41-44]. Proper care should be taken for allergic asthma before hospitalization by avoiding specific allergens and other precipitating factors [45,46]. Some of the ways that help relieving asthmatic conditions are elevating the head of the bed four to six inches, avoiding smoking, alcohol, chocolate and caffeine, eating or drinking nothing two to three hours before bed, avoiding greasy, fatty foods, maintaining a healthy weight [47]. There are lots of medicines in homeopathy for asthma symptoms and it is not possible to list them all here. Some of the common medicines are ars-alb, ipecac, lachesis, pulsatilla, spongia, sulphur, ignatia, antim-tart, hepar-sulph, nat-sulph, tuberculinum etc [47,48]. Bronchodilators and steroids do not help the body improve its response to allergens (irritants) or simply

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fail to improve the faulty immune mechanism [49]. Homeopathic medicines help by improving our body's natural (immune) responses guiding the body back to a healthy state, naturally [50-52].

CONCLUSION

High rate of morbidity and mortality from this disease in children have been seen since the past. Drugs with anti- inflammatory action and beta-agonists have shown increased mortality rates and are less effective in children. In order to better manage the disease, parents should be knowledgeable about the symptoms and the causes of asthma and the medications prescribed to the child. Health care professionals dealing with this disease being open minded about what constitutes optimal therapy will result in improved control and prevention of pediatric asthma.

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