

Controlling asthma and related allergies - alternative options

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ABSTRACT:

Asthma is a medical condition that causes narrowing of small airways in the lungs. Asthma is a chronic inflammation of lung passages, involving eosinophils, mast cells, T-cells, neutrophils, macrophages. Typically, asthma patients develop wheezing and have increased mucous production in their lungs, which causes breathlessness and chest tightness particularly during night. The most common inhaled allergens that trigger asthma attacks are: pollen, cockroach allergens, animal dander, mites in house dust, fungi (molds) that grow indoors, chemicals, fumes, or airborne industrial pollutants, smoke. In addition, inflammation in asthma can also be triggered by: viral respiratory infections, gastroesophageal reflux disease & other conditions. In the year 2007 report by WHO estimates that more than 300 million people suffer from asthma worldwide, and almost 2,50,000 deaths attributed to the disease. In the past decade much of interest has been shown in alternative medicine and asthma was not an exception. The authors have summed up the alternative treatment strategies, which may atleast be used as adjunct in the treatment of asthma and related allergies.

Keywords:

Asthma, herbal medicine, alternative regimens.

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INTRODUCTION:

Asthma including allergic asthma is a common, complex and chronic disease of the respiratory tract broadly defined by inflammation of the airways associated with airway hyperresponsiveness (AHR), mucus hypersecretion, reversible episodic and sometimes persistent airflow obstruction of variable degrees and remodeling of the airways (Busse and Lemanske,2001), although it is not completely clear how inflammation, remodeling and airway hyperreactivity are linked. The airflow obstruction caused by the constriction of airway smooth muscle (ASM), airway wall thickening, and/or mucus secretion induces shortness of breath, chest tightness, wheezing and coughing in asthmatics, during episodes that may be triggered by exposure to a wide range of exogenous and endogenous stimuli including irritants, allergens, cold air, or exercise, or may occur seemingly spontaneously and these symptoms are often worse at night (**Figure 1.**) (British-Thoracic-Society; Hershenson et al., 2008). Asthma is a chronic inflammatory condition, and evidence of inflammation can be observed in mild, moderate, and severe disease. However, the relative magnitude, type of inflammatory cells, and site of the inflammatory infiltrate may differ among patients. Many cells are involved in the immune and inflammatory responses to allergens in asthma; these include T-cells, eosinophils, mast cells, neutrophils and epithelial cells. The different clinical expressions of asthma involve varying environmental factors that interact with the airways to cause acute and chronic inflammation, and the varying contributions of

smooth muscle contraction, edema and remodeling of the formed elements of the airways. Although chronic (typically eosinophilic) airway inflammation and remodeling are pathological hallmarks of asthma; heterogeneity of clinical presentation, accompanying atopy, clinical severity, airway inflammation, and genetic predispositions indicate that asthma is a syndrome rather than a single disease. Asthma is considered as a good example of gene-environment interactions, although no single gene or environmental factor accounts for the disease. The heterogeneity of asthma also relates to the different response to therapies (Hershenson et al., 2008). The histopathological changes in the bronchial and bronchiolar walls in asthma involve the mucosa (i.e., the epithelium and lamina propria), submucosa [with included airway smooth muscle (ASM) and mucus-secreting glands], and adventitia (the interface between airway and surrounding lung parenchyma) (Hogg, 1993). The characteristic pathological features of asthma include the presence in the airway of inflammatory cells, plasma exudation, edema, smooth muscle hypertrophy, mucus plugging, and shedding of the epithelium (British-Thoracic-Society).

Asthma is one of the most common chronic diseases worldwide with a prevalence estimated at 5% of the population and is among the major health issues in developed countries with rising incidence and prevalence (Apter and Weiss, 2008). Reflecting its increased prevalence over the past 40 years in the developed world, almost 30 million Americans have asthma. The social and economic costs of asthma are staggering. It is the most common cause of missed school days by children, and costs related to asthma care or to lost wages and productivity in the United States exceed \$16 billion annually (Hogg, 1993). Despite effective therapies, the incidence of this disease and the frequency of its significant complications are increasing. However, new therapeutic approaches based on our understanding of the pathophysiology of asthma could have profound repercussions for the care of asthmatics and the health of the public in general.

Asthma and Plant derived compounds:

Herb and plant based preparations are a popular treatment for asthma, although there remain concerns as to their efficacy and safety. In Western societies, motivations for using such treatments may be both positive and negative, with their perceived safety and dissatisfaction with conventional medicine among them. In China such

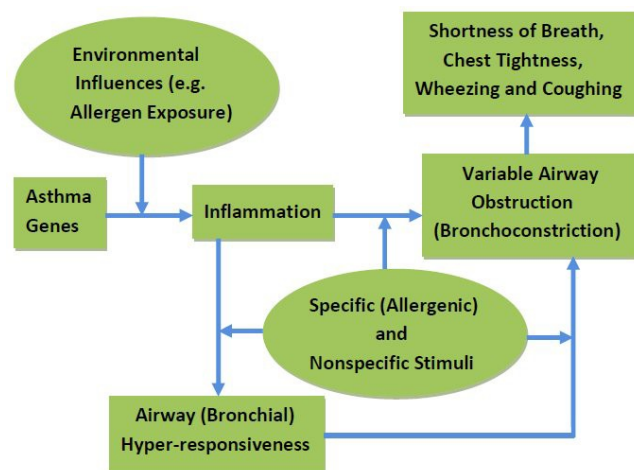


Figure 1: Development of allergic inflammation in asthma and relationship to bronchial hyper-responsiveness and symptoms.



treatments are more commonly used and many compounds considered 'conventional' are derived from herbs or plants. Ginger, cayenne, Indian tobacco (*Lobelia inflata*), turmeric, skunk cabbage, and goldenseal are supposed to hold promise for asthma sufferers.

The search for novel treatments for asthma has significantly advanced in recent years and this increased attention has led to the exploration of alternative medicines with particular interest in plant products that have been in use for many years in the old world countries. Several scientific studies in recent years suggested that some of these folklore medicines have significant effect in reducing the severity of respiratory disease symptoms and improving patient's quality of life. The alternative medicines, particularly plant extracts have shown acceptance by patients and physicians alike (Bielory and Lupoli, 1999; Markham and Wilkinson, 2004). However, no detailed scientific studies have been conducted to further the understanding of anti-allergic mechanisms associated with these products. In spite of the lack of information, a substantial interest has been shown to alternative and supplementary medicines. In addition, the side effects from long-term use of asthma drugs have prompted interest in complementary and alternative therapies such as Traditional Chinese Medicine (TCM) herbs. In a recent article, National Center for Complementary and Alternative Medicine (NCCAM) supported scientists from the Mount Sinai School of Medicine to review research evidence on TCM herbs for asthma, focusing on studies reported since 2005 (Li and Brown, 2009).

Currently, closer to 2,000 herbal products are available for the treatment of various ailments and the list is steadily growing (Bielory and Lupoli, 1999; Markham and Wilkinson, 2004). A number of herbs and herbal products have been used in the treatment of allergy and asthma in ancient traditional Chinese medicine, Indian Ayurvedic medicine, and Japanese Kampo medicine. However, few scientific studies have been carried out to ascertain their action and effectiveness (Kobayashi et al., 1997; Shivpuri et al., 1972).

Other Asthma Therapies:

Immunomodulation

Asthma is thought to be mediated through the imbalance of Th2 and Th1 cell responses. Th2 lymphocytes are thought to play a key role in the pathogenesis of asthma. Of the Th2 cytokines IL-5

is regarded as most important because its expression correlates with asthma severity and local eosinophil infiltration (Castro et al., 2000; Truyen et al., 2006). Therapeutic strategies directed towards inhibition of Th2 cytokines would thus seem to offer an attractive immunomodulatory strategy for asthma (von Hertzen and Haahtela, 2000). IL-10 is one of those cytokines that inhibits inflammation, and cytokine therapy with IL-10 may have relevance as for as asthma is concerned. While it may not be possible to administer cytokines directly into patients, strategies may be developed to increase their release e.g., that of IL-10 release (Asadullah et al., 1998). IL-12 is produced by APCs and have role in the Th1 cell development, Th1 cells secrete IFN-gamma that may strongly inhibit Th2 cytokines (Shevach et al., 1999).

Acupuncture for Asthma:

Acupuncture is a treatment originating from traditional Chinese medicine. It consists of the stimulation of defined points on the skin (mostly by insertion of needles). Acupuncture has traditionally been used to treat asthma in China and is used increasingly for this purpose internationally (McCarney et al., 2004a). It is thought that such treatments can correct any imbalances in vital life energy (perhaps along the lung, spleen, or kidney system meridians) that may be triggering the breathing problems. A few small clinical trials showed that acupuncture may help improving asthma symptoms. But to date, the research is inconclusive, since no one has conducted either a review or a randomized controlled trial for the gold standards in proving a treatment successfully. The most recent Cochrane Collaboration Review, found that while some improvements in asthma were seen, the results were not consistent.

Chiropractic Treatment for Asthma

Chiropractic is a health care profession that focuses on the relationship between the body's structure-mainly the spine-and its functioning. Although practitioners may use a variety of treatment approaches, they primarily perform adjustments (manipulations) to the spine or other parts of the body with the goal of correcting alignment problems, alleviating pain, improving function, and supporting the body's natural ability to heal itself. Chiropractic practitioners think that Asthma is a symptom of a misalignment of the spinal vertebrae, which chiropractic adjustments can correct. When medical researchers tested chiropractic manipulation as a treatment of asthma

in children, they reported that "the addition of chiropractic spinal manipulation to usual medical care provided no benefit (Balon et al., 1998). Although chiropractic manipulation can be beneficial in the treatment of some types of neck and back pain, it is advisable not to take infants and children to a chiropractor, since the risk may outweigh any benefit. A systematic review of literature on results of the eight retrieved studies indicated that chiropractic care showed improvements in subjective measures and, to a lesser degree objective measures, none of which were statistically significant. It is evident that some asthmatic patients may benefit from this treatment approach; however, at this time, the evidence suggests chiropractic care should be used as an adjunct, not a replacement, to traditional medical therapy (Kaminskyj et al., 2010).

Environmental Medicine for Asthma:

Although there are genetic factors which predispose to the development of asthma (Scirica and Celedon, 2007), and genetic differences may alter susceptibility to asthma, as well as responsiveness to asthma medications (Expert-Panel-Report, 2007). Exposure to certain environmental factors may contribute significantly to the risk of developing the disease (Ege et al., 2011; Rosenstreich et al., 1997). Environmental exposure in sensitized individuals is a major inducer of airway inflammation, which is a hallmark finding in the asthmatic lung. Although triggers induce inflammation through different pathways, the resulting effects all lead to increased bronchial reactivity. Food allergies, molds, pollen, dust mites, animal dander, tobacco smoke, some chemicals, and more can trigger asthma (Ballmer-Weber, 2011; Huss et al., 2001; Sporik et al., 1990; Wahn et al., 1997). Treatment may include desensitization, avoidance of triggers, and nutritional supplements (such as antioxidants).

Homeopathy for Asthma:

Homeopathy is a system of medicine which involves treating the individual with highly diluted substances, given mainly in tablet form, with the aim of triggering the body's natural system of healing (Ernst, 2002). Based on their specific symptoms, a homeopath will match the most appropriate medicine to each patient. Homeopathic remedies are prepared by serial dilution with shaking by forceful striking on an elastic body, which homeopaths term succession, the process of dilution continues till no traces of original chemical are found (Creighton-University, 2009). The

dilutions advocated by Sameul Hahnemann (German physician) (Haehl, 1922) and those used today often reduce the concentration of the initial substance to infinitesimal levels. Hahnemann himself understood that dilutions of the magnitude he used eliminated all of the original substance. He believed, however, that the healing power of the substance could be preserved and actually concentrated by the process of dynamization. Although a Cochrane study was inconclusive about the homeopathic benefits (Linde and Jobst, 2000). Specific remedies are tailored to the individual, but common prescription used in asthma treatment is aconitum napellus. Some of the results with homeopathy are thought to be a placebo effect (Ernst, 2010). The results of a clinical trial with both acupuncture and homeopathy are awaited (McCarney et al., 2004b). In another clinical trial it was found that the symptoms of patients undergoing homeopathic treatment improved substantially and conventional medication dosage could thus be substantially reduced (Grundling et al., 2011).

A Hypothesis:

Immunotherapy exposes the patient to small doses of the allergen over a period of time a process called desensitization (Eifan et al., 2011). In a way a person is exposed to small quantities of allergen, the body becomes less sensitive to allergen. In short the body becomes tolerant to the allergens. Pollen is an airborne allergen that may set off numerous asthma symptoms in sensitive people at certain times of the year (Galan et al., 2010; Kim et al., 2007; Ridolo et al., 2007; Singh and Shahi, 2008; Yao and Zhang, 2009). Since during honey making the bees utilize almost all types of pollen, degrade it into smaller components and this becomes a part of the honey, small amount of honey if consumed throughout year will thus desensitize the body against a plethora of allergens. This is because the body will already have seen the allergen in honey, and it is well established that honey contains pollen particles (Ferrerres et al., 1998; Todd and Vansell, 1942). The things to be remembered about honey is that it should be local (i.e., preferentially produced in the vicinity of the patient, so that the local allergens are present), it should be consumed round the year to harness better benefits. In addition taking honey is considered to be good as it has a wide range of benefits, it has a plethora of amino acids (Perez et al., 2007; Rebane and Herodes, 2010), antioxidants (Al-Hindi et al., 2011; Alvarez-Suarez et al., 2010a; Alvarez-Suarez et al., 2010b;



Liberato Mda et al., 2011), vitamins (Ciulu et al., 2011; Leon- Ruiz et al., 2011), has anti-inflammatory substances (Kassim et al., 2010a; Kassim et al., 2010b) and anti-bacterial actions (Al-Waili et al., 2011; Chang et al., 2011; Kwakman and Zaat, 2011); In addition it has great anti-cancer properties (Hassan et al., 2010; Jaganathan and Mandal, 2009a, b; Samarghandian et al., 2011; Swellam et al., 2003). Honey is also considered as a good energy source due to its high carbohydrate content (Bogdanov, 2010). It is not surprising thus to find that the Holy Quran sums up honey making and its benefits in just two verses “And thy Lord taught the Bee to build its cells in hills, on trees, and in (men's) habitations; Then to eat of all the produce (of the earth), and find with skill the spacious paths of its Lord: there issues from within their bodies a drink of varying colours, wherein is healing for men: verily in this is a Sign for those who give thought” (Al-Quran, Chapter 16).

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