

Analysis of Preventive Measures Based on Current Research Status of Allergic Reactions

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Abstract. Allergic reaction is also known as hypersensitivity reaction, refers to the abnormal specific immune response that occurs in the body after the sensitized body is exposed to the same antigen again. Allergic reaction is mainly physiological dysfunction or pathological damage to tissues and cells. In recent years, with the rapid changes in the human living environment, the incidence of allergic diseases has increased day by day. In the past 20 years, the incidence of allergic diseases has doubled in Western developed countries, and the global prevalence has reached as high as 22%. In recent years, many breakthroughs have been made in the diagnosis, prevention, and treatment of allergic diseases. But there are still gaps in many areas. This article analyzes the integration and analysis of allergy types, causes, treatments, and clinical symptoms. It provides basic knowledge and theoretical support for future research. The problem of preventing allergies has not yet been solved, and future research can focus on methods to prevent allergic diseases.

Keywords: Allergic reactions; treatments; diagnose; prevention.

1. Introduction

Allergies should be familiar to most people. Nowadays, many people all suffer from allergies from time to time. And these people know very little about allergies. In modern medicine, the research on the mechanism and treatment of allergies is not perfect, and there are still gaps in many aspects. For example, for patients with primary immunodeficiency disease who need to detect plasma immunoglobulin IgE, IgA, IgG, IgM, etc., diagnosis must be made. In addition, the diagnosis of allergic rhinitis, anaphylactoid purpura, allergic asthma and other diseases also needs to be completed with a variety of examination means.

Over the past few decades, the prevalence of allergic diseases has increased worldwide. This essay reviews the etiology and pathophysiology of allergic diseases, including the role of epithelial barriers, the immune system, climate change, and pollutants. The current understanding of the roles of early life and infancy, diverse diets, skin, respiratory and gut barriers, and the microbiome has led to changes in prevention guidelines for building immune tolerance to common environmental allergens. Recent developments in mechanisms associated with allergic diseases have translated into effective treatments. The research on food allergens has made remarkable progress in recent years, and the prognosis and treatment of immune deficiency diseases such as anaphylactoid purpura have gradually broken through.

The research gap on the current allergy problem includes certain immunodeficiency diseases such as allergic rhinitis and asthma. The number of asthma patients is expected to increase to 400 million by 2025 [1], among which allergic asthma accounts for about 70% [2], and the incidence of allergic rhinitis in industrialized countries is as high as 10% [3]. At the same time, there are also some deficiencies in the treatment and diagnosis of immunodeficiency diseases.

The essence of allergy is the overreaction of the immune system, and because of the different allergens of different people or different populations, the reasons for immune deficiency diseases are also different. When facing immune deficiency diseases, people should understand the main treatment methods of immune deficiency diseases caused by allergies and the causes of such diseases. Skin allergy may be caused by contact with allergens such as pollen or animal fur, or it may be related to inhalation or skin contact, such as dust in the air or animal fur, or it may be caused by eating certain foods. If not treated in time, it may lead to gradual aggravation of allergic reactions, symptoms such

as erythema, pimples and wind clumps on the skin surface, and may also be accompanied by local skin itching. In severe cases, erosion or exudation may occur, affecting the recovery of the disease.

This paper analyzes the causes, symptoms and treatment of allergies from the perspective of the types of allergens. The aim is to provide a treatment system for allergic diseases for future research by integrating the causes and treatment systems of allergies.

2. Allergy Cause Classification

The causes of allergy can be generally divided into contact allergy, inhalation allergy, food allergy, drug allergy and the body's hyperimmunity.

The following are the causes of allergies and common immune deficiency diseases:

1) Contact allergy: Contact allergy generally refers to contact dermatitis. Contact allergy is an acute or chronic inflammatory reaction that occurs at the contact site of the skin mucosa after exposure to some exogenous substances. Clinical manifestations can be mild local erythema, light red to bright red, slight edema or small papules, severe erythema swelling obvious, papules, blisters, severe inflammation can occur bullosa. Blister rupture has erosion, seepage and scab, patients feel itching or burning pain, scratching can bring pathogenic substances to distant parts and produce similar skin lesions. The pathogenesis of contact dermatitis includes irritation, allergy and inhalation, food, etc. Due to the different pathogenesis, the causes of the disease are also different.

2) Inhalation allergy: The symptoms of inhalation allergy are mainly respiratory symptoms, and there are certain differences according to the severity of the disease. The proteins and polysaccharides in inhaled allergens are the main components of allergic diseases. They diffuse in the air and are deposited on the airway mucosa after being inhaled by the human body, causing local or systemic immune reactions. Common inhaled allergens include mugwormwood, house dust mites, tree pollen, grass pollen, mulberry, animal dander, ragweed, house dust mites, mold, etc.

3) Ingestion allergy: After eating allergy can cause skin, respiratory system, digestive system symptoms. Skin symptoms after eating allergy are more common, patients will appear skin itching, erythema, papules, lips and oral mucosal edema performance, serious will also form urticaria. Digestive system symptoms are also more common in food allergies, mainly manifested as vomiting, diarrhea, bloating, mucous blood stool and so on. Respiratory symptoms are rare and can include coughing, runny nose, sneezing, nasal congestion, and itchy nose. In severe cases, chest tightness, shortness of breath, and difficulty breathing may occur [4].

4) Drug allergy: Drug allergy, also known as drug allergy, is an abnormal immune reaction between a drug (or its protein conjugate) as a foreign antigenic substance and antibodies in the body. Drug allergy can affect all organs and tissues of the whole body, and can cause systemic reaction and skin reaction, which has been well known to clinical workers. The following talks about the characteristics of drug allergy.¹ There is inconsistency in the allergic reaction of the population to drugs. One person may have an allergic reaction to one or a few drugs, and another person may have an allergic reaction to another or a few other drugs. People who have an allergic reaction to a certain drug do not necessarily have an allergic reaction to other drugs, but people with allergic constitutions can have an allergic reaction to more than one drug.

5) Abnormal immunity: irregular lifestyle such as long-term drinking, heavy smoking, and staying up late are the main reasons for decreased immunity. Then the body's internal humoral immune system overreacts, producing complex antigen-antibody reactions to daily contact with high protein, dust and other substances, resulting in allergic symptoms.

To sum up, there are several causes of allergy symptoms:

Internal causes: autoimmune diseases, digestive system diseases, other chronic systemic diseases, infections, metabolic disorders, etc.

External causes: pollen, dust, dust mites, chemicals, improper skin care products, sunlight, hot and cold stimulation, etc

Allergic reactions have 2 points in common, the first is the Location and manifestations, allergic reactions mainly occur in the nose, eyes, respiratory tract and skin, and are manifested as nasal congestion, cough, dyspnea, nausea, vomiting, conjunctival congestion, rash, etc. Second is that these reactions will not cause serious damage, the allergic reaction will not destroy the tissue cells, nor will it lead to serious damage to the tissue, and there are obvious genetic tendencies and individual differences.

3. Detection of Allergens

The treatment of allergies can be divided into basic treatment, drug therapy and desensitization therapy. During the treatment of allergies, it is necessary to avoid eating spicy and other irritating foods to avoid aggravating the condition.

Basic treatment: If the allergen is identified, avoid contact with the allergen. When the allergen cannot be determined, it should be timely to the hospital for allergen testing. In daily life, try to avoid contact with allergens, do a good job of protection.

Drug treatment: oral antihistamines, such as loratadine, cetirizine, chlorpheniramine maleate, etc. Corticosteroid hormones such as prednisone and beclomethasone, or immunosuppressants such as cyclosporine, tacrolimus and tripterygium glycosides can also be used to treat allergic inflammation. Topical drugs can also be used to treat allergic inflammation, such as halometasone cream, mometasone furoate cream or calamine lotion.

Desensitization treatment: when some allergens cannot be avoided, desensitization treatment can be used, mainly for the treatment of specific allergic substances that cause allergic diseases. After determining the allergen, the allergen is made into allergen extract, and prepared into preparations of different concentrations, and the allergen positive person is injected subcutaneously, the dose is from small to large, the concentration is from low to high, and the reaction to the allergen is induced to reduce until no allergic reaction occurs.

4. Treatments

4.1. Defects

Instrument treatment: more against the natural laws of skin metabolism, mandatory removal of skin allergies. Cause damage to the stratum corneum of the skin, even the possibility of atrophy of the stratum corneum, easy pigmentation, easy recurrence.

Chinese medicine treatment is a drug four poison, the efficacy of Chinese medicine diverse, cannot accurately define the effective active ingredients, the lack of modern bioengineering technology, some Chinese medicine ingredients will also cause allergies.

Topical cosmetics: can only improve skin allergy symptoms from the surface of the skin, the target is very single, the symptoms do not cure the root cause. Some topical products may contain irritating ingredients, hormones, and harmful chemicals that harm the skin in direct contact.

4.2. Improvement Methods

The damage to the human body can be reduced through the combination of instrument treatment with drug treatment and traditional Chinese medicine treatment, such as the use of acupuncture treatment, which can enhance the resistance to disease, the effect is significant, and the cost is low [4].

At present, there are mainly three kinds of detection of allergens in allergic reactions in hospitals, namely skin prick test, in vitro IgE detection and specific patch detection. Different allergen tests are suitable for different diseases. Skin prick test is suitable for examining asthma, allergic rhinitis, conjunctivitis, allergic urticaria, etc., as well as testing the efficacy of desensitization treatment. IgE detection in vitro is mainly used in clinical diagnosis of allergic diseases, and IgE elevation has good diagnostic value with atopic dermatitis, urticaria, allergic rhinitis, bronchial asthma, tuberculous

granuloma, etc. IgE detection is a basic method for evaluating suspected allergic reactions. Compared with in vivo detection methods, IGE detection is safer, simpler, not affected by antihistamines, and has the advantages of strong repeatability, high accuracy and quantization [5]. Indication of patch test is used to help find the cause of some allergic skin diseases caused by contact, such as contact dermatitis, eczema, and some occupational skin diseases.

5. Typical Symptoms of Allergies

5.1. Symptoms

Due to the different factors that cause allergies, the symptoms are not the same, mainly red skin, itching, cough, sore throat, runny nose, stuffy nose, itchy nose, red and swollen eyes and so on. In severe cases, nausea, vomiting, diarrhea, dyspnea, shock and other symptoms may occur.

Sudden appearance of pink wind of varying sizes on the skin, mostly round, oval or irregular shape, can occur in any part of the body; Some patients may involve the gastrointestinal tract, resulting in mucosal edema at this site, clinical abdominal pain and diarrhea. Dyspnea may occur if the laryngeal mucosa is involved. Severe patients may be accompanied by palpitation, irritability, nausea and vomiting, dyspnea, laryngeal edema, and even anaphylactic shock manifestations such as decreased blood pressure.

Chronic urticaria is a common and recurrent allergic disease in clinic. Its pathogenesis is not only the release of histamine by mast cell degranulation. There are also autoantibodies to IgE and its receptor, FcεRI, induced autoimmune reactions, Th1/Th2 cell subsets imbalance, and subsequent inflammatory reactions caused by the release of the inflammatory transmitter leukotriene [6].

Sudden nasal itching, continuous sneezing and a large number of watery serous nasal secretions, each attack symptoms last more than 1 hour, often repeated attacks. Allergic rhinitis is a common disease that affects 10-25% of the world's population. According to a rough estimate, the current international treatment options for allergic rhinitis mainly include staying away from allergens, drug therapy, immunotherapy, etc [7].

The patient first presented with skin and mucous membrane flushing, skin itching all over the body, especially itching on the palm, numbness on the lips, tongue and extremities, and then various rashes, mostly gale-like, large dermis and subcutaneous angioedema. Blood pressure dropped sharply, systolic blood pressure dropped below 80mmHg, pulse pressure within 20mmHg. In severe cases, circulatory failure can occur, which is manifested as blurred consciousness, cold sweat, pale face, cold limbs, thin pulse and so on. If the disease is not controlled in time, a few cases can develop cardiac arrest and death in a short time.

Itchy eyes, watery eyes, red eyelids; Nasal itching, sneezing continuous attacks, often up to a dozen, after sneezing watery secretions increased, in the onset of more than all day; Throat itching, dry throat, dry cough, etc. Hay fever is one of the most representative allergic diseases, and its incidence is increasing year by year, especially after the 1980s, its incidence is rising rapidly, which has become a worldwide health problem. In 1997, the World Health Organization listed these diseases as "priority diseases for research and prevention in the 21st century" [8].

More sudden or aggravated, paroxysmal expiratory dyspnea and wheezing sound, the general attack time is several hours. Before the attack, there are many premonitorings of mucosal allergy such as sneezing, runny nose, cough, followed by a sense of urgency in the chest, severe cyanosis, sweating, sitting position, until loss of consciousness. The prevalence of allergic asthma is increasing rapidly in many parts of the world. Its pathogenesis is related to complex genetic background and environmental factors [9].

5.2. Causes

1) contact with allergens: mainly including dust, mites, animal hair, catkins, animal protein, seafood, mango, a variety of antibiotics, etc., in contact with these allergens, it is prone to allergic diseases.

2) allergic constitution: mostly a pathological reaction, mainly refers to a specific constitution formed on the basis of innate genetics. If you touch an allergen, you are prone to allergic reactions and allergic diseases. Can go to the hospital for allergen testing, usually should stay away from allergens.

3) decreased immunity: When immunity is decreased, the body is gradually sensitive to allergens, contact with allergens may cause skin itching, redness and other allergic reactions.

4) mental factors: may be caused by mental over tension, if the mental overtension, may produce more neuromediators, and these mediators will directly stimulate the blood vessels and inflammatory cells in the skin, and sometimes the above symptoms will occur. You need to adjust your mood to avoid excessive stress so that you can relieve allergy symptoms.

5) endocrine disorders: If there is an endocrine disorder, this time may lead to body hormone levels disorder, and then prone to allergies.

Allergic reactions may affect the normal metabolism of the human body Metabolism refers to the basic characteristics of the life activities of the organism, but also the basic material of life activities, but also includes the metabolism of the human body. If there is metabolic disorder, it may cause human growth, development or aging and other phenomena, but also cause certain damage to the skin, causing skin allergic reactions; It may also cause metabolic disorders, metabolic disorders may refer to metabolic product excretion disorders, if the body's metabolism disorders, may affect the normal function of the skin, cause skin allergic reactions [10].

6. Conclusion

Allergy is an abnormal reaction of the immune system, which normally recognizes and fights off substances that are harmful to the body, such as bacteria, viruses, or other foreign substances. In an allergic reaction, the immune system overreacts to normally harmless substances (allergens). When the body first comes into contact with an allergen, the immune system recognizes it as a threat and begins to produce a specific type of antibody (IgE antibody) to target that allergen. When exposed to the same allergen again, IgE antibodies bind to the allergen, causing immune cells to release chemicals, such as histamine, that trigger an inflammatory response. Inflammation can lead to typical allergic symptoms, such as nasal congestion, sneezing, itchy eyes, watery eyes, skin redness and itchiness, difficulty breathing, etc. Severe allergic reactions can lead to anaphylactic shock, which is an emergency and needs to be treated immediately. The type and severity of allergic reactions vary from person to person. Common allergies include pollen allergy, food allergy, drug allergy, etc. Genetics, environment, lifestyle and other factors may affect whether a person is prone to allergic reactions.

There are many measures to prevent allergies, mainly including avoiding contact with allergens, adjusting diet, exercise, drug prevention and other measures. By analyzing the main causes of current allergic symptoms and related treatment methods, this paper draws a conclusion that the types, characteristics and treatment methods of allergic reactions are related. Future studies can refer to this paper and provide research support for the improvement of the treatment of immune deficiency diseases and allergic reactions.

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