CHEMICAL SENSITIVITY AND RASHES

Various chemical substances—ranging from poison ivy to soaps to metals—can cause allergic skin rashes. These rashes are called allergic contact dermatitis (ACD). While few dermatologists perform the necessary skin testing to determine the cause of ACD, many allergists are experts in figuring out what substances are the culprits.

The ACD rash is red, very itchy, and is frequently blistered. It emerges at the site where skin makes contact with the chemical. For example, nickel sensitivity causes a rash beneath rings on fingers, or under watches on wrists, or, for earrings, on the ear lobes. Poison ivy or oak produces a linear rash anywhere on the skin that makes contact with these plant oils, often on the forearms or face. Those allergic to artificial nails or cement tend to experience a rash around the eyes since, unconsciously, people frequently touch their fingers to their face.

While ACD is caused by immune sensitivity to some chemicals, hives are caused by a different mechanism. Hives are red, raised, itchy welts which are often circular but not blistered. In hives, the allergic reaction is set off by a type of allergic antibodies called Immunoglobulin E (IgE) which

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NEW FORMS OF IMMUNOTHERAPY

The only way to "cure" an allergy is to build up an immunological tolerance to the substances in the environment that cause the allergic reactions (allergens).

Ever since they were introduced in 1911, allergy shots have successfully desensitized patients to allergens such as grass or ragweed pollens, molds, dust mites and animal danders. Because the shots work through the body's own immune system, this treatment is known as "immunotherapy" or "allergen vaccination."

While allergy shots are quite effective, this form of immunotherapy requires a patient to receive weekly injections for eight to 10 months. The frequency of the shots, over time, can be reduced to once a month. Although the average total duration for shots varies, the average time span is three to five years, with the exception of some very sensitive individuals who may require additional shots long term. The immunity built up in the body from these shots lasts for many years; for many patients, they last for their entire lifetimes.

There are some significant barriers to allergy shots. Some people fear needles, while others are unable to come to the office for shots due to school or work schedules. Other people become frustrated with time it takes for the shots to work and become noncompliant. It may take from four to six months before a patient starts to see improvement.

Recent research has been working to find new routes of immunotherapy to replace injections—especially the use of oral tablets. For many years, some otolaryngologists—known as ear, nose and throat or ENT physicians—treated patients with drops under the tongue for oral desensitization. However, the doses they used were too low to produce good immunological responses and clinical improvement was inconsistent.

Over the past 20 years, physicians and scientists in Europe have pioneered the use of immunotherapy tablets for oral desensitization. These studies have shown that the tablets, containing higher doses of allergens, when taken daily, can successfully build up immunity to allergens such as tree or grass pollens and dust mites.

In 2014, the U.S. Food and Drug Administration (FDA) approved oral desensitization tablets for grass and ragweed pollens.

One of these tablets is placed under the tongue once a day beginning 12 weeks before the pollen season starts. The first dose, however, must be given in a doctor’s office. This is imperative so the patient can be monitored for any severe allergic reactions (anaphylaxis) to the tablets. Common side effects include itching and local swelling of the mouth and tongue. Subsequent tablets can be taken daily at home for the rest of the pollen season.

The first approved tablets of this kind were GrasteK and Oralair for grass pollen allergy and Ragwitek for ragweed pollen allergy. The grass tablets may be given all year while the FDA indication for ragweed is seasonal administration starting 12 weeks before ragweed season (May 15 when ragweed usually begins around August 15).

These tablets appear to be most helpful in patients whose allergies are largely confined to a

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trigger the release of chemicals such as histamine. In contrast, ACD is due to cellular sensitivity to different compounds without the involvement of IgE. Blood cells such as lymphocytes recognize the compounds as foreign and mount an inflammatory reaction to fight them.

What are some of the chemicals that can cause this type of rash? Many soaps and cosmetics may contain potentially allergenic substances such as fragrance, lanolin, and preservatives like formaldehydes. Hair colorings usually include a chemical called paraphenylenediamine which can cause a rash in susceptible people. Jewelry, watches, and surgical hardware use nickel or chromium alloys as hardeners. Contacts with plants which contain urushiol, such as poison ivy, oak or sumac, also may lead to rashes.

The main treatment for allergic contact dermatitis is to avoid any offending substances. To do this, however, requires identifying the culprits. This can be accomplished by a patch test on the skin.

In patch testing, a small metal disc is coated with the chemical and then taped 10 at a time to the patient's back. The tape is removed at 48, and sometimes 72, hours later. If the patient is allergic to that chemical, then a rash will appear under that particular disc.

IMMUNOTHERAPY

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single allergen; this is called "mono-sensitized." An example of this would be someone allergic mainly to just ragweed in the late summer and fall. However, the majority of Americans are "poly-sensitized," or allergic to many allergens, such as tree, grass, ragweed, mold and dust mites.

At the time of their 2014 release, no studies had been done on these oral desensitization tablets to determine patient safety in the event these tablets were to be taken simultaneously with shot therapy for other allergens, or if the tablets could be taken together for more than one allergen. (e.g. grass and ragweed tablets the same day).

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IS YOUR ASTHMA UNDER CONTROL?

Like an iceberg in the ocean, significant elements of asthma lie beneath the surface. How can an allergist tell if someone's asthma is under control? This is an important question because the degree of control attained guides medical decisions about which medications and how much of them to use to prevent dangerous asthma attacks.

Asthma is an inflammatory disease which obstructs the small airways in the lungs and leads to coughing, wheezing, chest tightness and shortness of breath.

No single technique exists to assess the effectiveness of asthma treatments. One method used is to ask patients key questions which help determine the degree of control. Common examples of these include the number of times a week a patient needs to use an albuterol rescue inhaler, whether or not asthma wakes them up at night, and the ability of a patient to walk, climb stairs or run.

Some of these historically important questions for patients are summarized by something called the "Rules of Two&": Have asthma symptoms required you to use your quick-relief inhaler more than two times a week? Do you awaken at night with asthma symptoms more than two times a month? Do you refill your quick-relief inhaler prescription more than two times a year? Is your measured peak flow less than twenty percent your best level, and you are having asthma symptoms?

A similar approach is to quantify such historical information through scores on standardized questionnaires. The Asthma Control Test (ACT) is one such commonly used instrument. The answers to five questions yield a composite score of between five and 25. A score of 20 to 25 indicates good control.

The simplest way to quantify lung function is to investigate the peak expiratory flow rate (PEFR), which measures the rate at which air is flowing out of the lungs. A patient blows hard into a portable measuring tube to quantitate the PEFR from their lungs. During an asthma exacerbation, a patient experiences a drop in PEFR of more than 20 percent of their normal level.

Spirometry is a more sophisticated way to measure lung volumes and flow rates to determine the degree of airway obstruction or restriction. A patient, in the office, blows into a small device which can print out values such as the vital capacity and FEV1 (the expiratory volume in one second). A decreased FEV1 value is an indicator of the small airway obstruction characteristic of asthma.

In an asthma patient who experiences flare-ups, or has co-existing chronic obstructive pulmonary disease (COPD), the percent of oxygen saturation in the blood is an important value.

A newer way of assessing lung inflammation is the FENO test, which measures the amount of nitric oxide in an exhaled breath. Elevated levels of nitric oxide are associated with lung inflammation, flare-ups of asthma, or poor control of asthma.