An Herbalist's View
Allergic Reactions

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Allergic reactions are a very common and important set of symptoms for herbalists to learn to recognize and treat. They are a grouping of immunological reactions rather than a single disease. While their consequences are occasionally life-threatening (anaphylaxis and shock), there are many other less daunting circumstances where the experienced herbalist can mitigate symptoms and offer relief.

There are many types of allergic reactions; this handout will focus mainly on the category known as *Type I hypersensitivity* also known as immediate or anaphylactic-type reactions. (See below for differentiation of hypersensitivity types.) These are named due to the immediacy of the initial reactions. Initiators of these reactions include insect stings, pollen, stress, foods and drugs. Anaphylaxis may also result from this type of reaction, which is one of the most dangerous consequences of an allergic reaction.

Allergies can be tricky to diagnose and treat. People display highly idiosyncratic reactions, which take on a diversity of symptom pictures. Allergies may also show up suddenly in someone with no previous history of sensitivity to an allergen. The converse may also happen; people with a previous sensitivity to a specific allergen may find themselves less reactive after a time.

Hypersensitivity is a disorder of the immune system, in which there is an over (hyper) reaction to the substance causing the over-reaction called an antigen. Hypersensitivity reactions are classified by how they engage the immune system. This classification emphasizes how the immune system reacts with the antigen and the damage caused by the various immune components reaction to it. These categories are listed here to help distinguish the various immunological hypersensitivity allergic reactions from the one this paper is focused on, hypersensitivity type I.

Hypersensitivity types

- **Type I-Immediate or anaphylactic type** (see below)
- **Type II-Cytotoxic type**-These reactions involve Immunoglobulin G (IgG) and IgM binding to and destroying the cell the antigen is bound on. This is seen in pernicious anemia, acute rheumatic fever and transplant rejections.
- **Type III-Immune complex-mediated reaction**-The immune complex occurs after an antibody binds to antigen and causing an abnormal activation of the complement system, which goes on to destroy local tissue. Examples include; glomerulonephritis and systemic lupus erythematous (lupus, SLE)

- **Type IV-Delayed or cell-mediated reactions**-This type is mediated by T-cell lymphocytes rather than B-lymphocytes. The delay is due to the time it takes the T-cells and macrophages to mount a response, which may take from a few hours to a few days. Contact dermatitises such as poison ivy rashes are this type.

Type I Hypersensitivity-Immediate or anaphylactic type.
These common allergic reactions begin shortly after contact with an allergen. Some major risks include anaphylaxis, bronchoconstriction and anaphylactic shock. In Type I hypersensitivity an individual who has previously been encountered sensitized an antigen is now sensitized to it and has a strong immunological response in their next encounter. This is caused by the antigen binding with mast cells or basophils with pre-formed immunoglobulin E (IgE) from the last contact. This creates a cascading response involving the release of histamine, serotonin and other vasoactive substances. These agents attract other white blood cells causing further reactions. Depending on the severity of the response these substances alter blood vessels, smooth muscle and are pro-inflammatory. These can take the form of local or systemic responses. Local responses include, nasal congestion and discharge, wheal and flare, and hives. Major systemic reactions include difficulty in breathing and vascular permeability.
Type I reactions may have 2 distinct phases, the early phase and the late phase. The early phase reactions are usually noticeable within minutes after contact. The effects may include vasodilation, bronchoconstriction, increased capillary permeability, smooth muscle contraction and mucous secretion. These may subside within 1 hour. The late phase reactions occur from 2 to 8 hours after initial exposure. These symptoms are often similar to early phase reactions but are more intense and persistent. Late phase symptoms include greater inflammation of tissue, sluggishness and lethargy. These different reactions are caused by the different chemical mediators released by the body during early and late phase contact with an antigen.

Examples of Type I hypersensitivity

- Allergic asthma
- Allergic rhinitis
- Drug allergy
- Food allergy
- Insect venom allergy

Many substances (generally proteins) can act as allergens and cause allergic reactions. One of the frustrating aspects of treating hypersensitivity reactions is the difficulty of figuring out the causative agent, as they are often hard to pin down. Some common allergic reactions include;

1. **Allergic rhinitis** (AR)-Causes many of the common allergic reactions including; sneezing, itching, nasal congestion, itchy eyes, and rhinorrhea. Two major categories are seasonal allergic rhinitis (SAR) and perennial allergic rhinitis (PAR). SAR is usually associated with pollen exposure (hay fever) while PAR

occurs throughout the year. Some of the allergens include; pollens, molds, animal dander, and dust mites.

2. **Food allergy**-While there are some commonly identified food allergens (i.e.; wheat, dairy, peanuts), individuals may react to a wide variety of ingested foods. Food journals and elimination diets may help figure out the allergenic agent.

3. **Drug allergy**- Many drugs can cause an array of systemic allergic reactions including penicillin, aspirin and sulfonamides

4. **Insect venoms**-This is a group of insects (Hymenoptera) including bees, wasps, hornets, yellow jackets and ants whose sting or bite may produce a response. These are particularly dangerous allergic responses as the venoms are injected under the skin and may cause a deadly anaphylactic reaction. These insects are also common around human habitations and it may be hard to avoid.

5. **Allergic asthma**-Asthmatic hypersensitivity reactions may be caused by a variety of inhaled aeroallergens including pollen, animal dander, mold and dust mites. Symptoms include breathing difficulty, wheezing, anxiousness, cough with thick mucous. Triggers include; exercise, sudden temperature changes and stress.

Anaphylaxis (ana-against; phylaxis-protection) is a potentially life-threatening allergic reaction. It is caused by exposure to a new or previously encountered antigen. Anaphylaxis can be triggered by a number of sensitizing agents including food, drugs, chemicals and insect venoms,
Anaphylaxis is the result of an antigen-antibody reaction. When this reaction is formed basophils and mast cells release histamine and other vasoactive mediators. These may cause bronchoconstriction, and widespread vasodilation resulting in a greatly reduced peripheral blood flow and lowered cardiac output with circulatory collapse leading to shock. Due to the severity of this situation, proper treatment needs to be immediately administered or death may occur soon after.
Management of anaphylactic shock includes administering epinephrine (i.e.; an EpiPen), use of antihistamines (i.e., Benadryl), giving fluids and oxygen, hospitalization and other methods to reduce shock. It is helpful for everyone to understand these symptoms and know some appropriate care.

Symptoms of Anaphylaxis

- Abdominal cramping
- Anxiety
- Arrythmia
- Diarrhea
- Dizziness
- Hyperemia
- Hypotension
- Itching, general or localized
- Low pulse
- Nausea
- Shock
- Shortness of breath
- Sweating
- Swollen eyes
- Swollen face
- Swollen throat
- Weakness

Medicinal Plants

1. **Anemone**–Anemone spp.
2. **Bayberry**–Myrica spp.
3. **Beggar's ticks**–Bidens spp.
4. **California poppy**–Eschscholzia spp.
5. **Echinacea**–Echinacea spp.
6. **Ephedra**-Ephedra spp.
7. **Eyebright**–Euphrasia spp.
8. **Goldenrod**–Solidago spp.
9. **Hops**-Humulus lupulus
10. **Kava kava**-Piper methysticum
11. **Licorice**–Glycyrrhiza spp.
12. **Meadowsweet**–Filipendula ulmaria
13. **Nettles**–Urtica spp.
14. **Osha**–Ligusticum porteri
15. **Plantain**–Plantago spp.
16. **Ragweed**–Ambrosia spp.
17. **Skullcap**–Scutellaria lateriflora
18. **Slippery elm**–Ulmus rubra
19. **Turmeric**-Curcuma longa
20. **Valerian**–Valeriana officinalis
21. **Willow**–Salix spp.
22. **Wolfberry**–Lycium spp.
23. **Yerba mansa**-Anemopsis californica
24. **Yerba santa**–Eriodictyon spp.

Categories of Herbal Therapies

Antihistamine-like-this category is based on clinical observations of how these herbs *appear* to work as antihistamines. Whether or not they actually antagonize histamine remains to be researched.

Ephedra
Eyebright
Ragweed

Antiinflammatories–counteracts or reduce inflammation

Licorice
Meadowsweet
Turmeric
Willow

Anxiolytics–reduce anxiety

Anemone
California poppy
Hopes
Kava kava
Skullcap
Valerian

Astringents–tighten membranes and capillaries helping to reduce congestion

Bayberry
Blackberry root
Oak
Witch hazel
Yerba mansa

Constitutional therapies-a holistic approach to treating the person and the reason they are susceptible to allergic responses. This incorporates individualized herb formulas in a tonic approach.

Decongestants–relieve congestion, often drying out mucous membranes

Bayberry
Beggar's ticks
Ephedra
Eyebright
Ragweed
Wolfberry
Yerba santa

Drawing agents–draw out substances from the skin.
Activated charcoal
Clay
Slippery elm

Sympathomimetic–mimic the sympathetic nervous system reducing bronchoconstriction
Ephedra

Topical relief–relieve external itchiness
Clay
Plantain
Slippery elm

Glossary

1. **Aeroallergen**–any airborne allergen, such as pollen or molds
2. **Allergen**–a substance that elicits a hypersensitivity reaction
3. **Anaphylaxis**–a severe hypersensitivity reaction. See above
4. **Antibody**–see Immunoglobulin
5. **Antigen**–a substance that causes the formation of an antibody and elicits a reaction from that antibody
6. **Atopic**–a hereditary tendency to develop immediate allergic reactions often in the form of rashes and allergic asthma
7. **Basophil**–immune cells that contain histamine and other chemicals that mediate inflammation and allergic reactions
8. **Bronchoconstriction**-constriction of the airways causing coughing, wheezing and shortness of breath
9. **Complement system**–a group of plasma proteins associated with immunity that act as chemoattractants and lyse (put holes in) pathogens.
10. **Cytokine**-proteins produced by nucleated cells in response to stimuli. They act as intercellular mediators and generally act locally on nearby cells
11. **Desensitization**–a process to reduce individual response to an antigen
12. **Histamine**-a chemical in basophils and mast cells released in allergic, inflammatory reactions. These dilate blood vessels and constrict smooth muscles of the bronchi.
13. **Hives**–see Urticaria
14. **Hypotension**–low blood pressure
15. **Hymenoptera**–an order of insects including bees, wasps, hornets and ants
16. **Hyperemia**–a reddened area due to increased blood flow
17. **Hypersensitivity**–an abnormal excessive reaction to a stimuli
18. **Immunoglobulins**–are antibodies produced by B lymph cells. Each type of immunoglobulin responds to a specific antigen, which they target and mount a defense.
19. **Mast cells**–similar to basophils but are found concentrated in connective tissue.
20. **Papules**–a small solid red raised skin lesion. A pimple
21. **Psychogenic**–a condition originating in the mind

22. **Rhinorrhea**–nasal discharge of free flowing, thin, watery fluid
23. **Shock**–a severe generalized circulatory failure. It may arise from multiple causes. Inadequate peripheral blood flow and low cardiac output cause tissue damage and a progressively worsening positive feedback loop.
24. **Urticaria**–an intensely itchy skin condition characterized by transient wheals and papules.
25. **Vasoactive**-altering the diameter of blood vessels and affecting blood pressure
26. **Wheal and Flare reaction**–a skin eruption following an allergic reaction characterized by a raised pale patch surrounded by a red area. May be itchy