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# Lumps, Bumps, and Things That Go Itch in Your Office!

Renée P. McLeod, RN, DNSc, CPNP

This column includes a short case presentation and differential diagnosis. It is followed by a discussion of the disease or condition and how the school nurse should handle it.

## History

Sarah arrives in your office shortly after being dropped off for kindergarten. She is complaining of a very itchy rash over her back (Figure 1). Her teacher sent her directly to your office for you to decide if Sarah is contagious and should be sent home. She notes that Sarah had been running around and playing before the bell and may have a fever. You ask Sarah how long she has had the rash, and she tells you she is not sure. She woke up itching during the night, but it was better this morning, so she did not think to mention it to her mother.

## Physical Findings

Upon examination, Sarah appears to be a well-nourished 5-year-old. She is afebrile, but her face is flushed. Her vital signs are stable. You look up her medical card and note that she does not have any allergies, her immunizations are up to date, and she has not been absent from school. She is busy rubbing and trying to scratch her back, but does not appear to be ill.

Sarah has circumscribed, erythematous, and slightly edematous plaques or wheals with white or clearing centers surrounded by a faint white halo covering her back and shoulders (Figure 1). The plaques blanch when pressed. The rash appears to be "growing," with new lesions appearing as older wheals are resolving and are fading away. They seem to be getting lighter as her skin cools in contact with the cool air in your office. The rest of her skin is clear of any rashes or scars. Her nails and hair do not seem to be affected.

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Her lips and mucus membranes do not show any evidence of swelling, she is not having any difficulty talking or swallowing, and she has no other pains or complaints.

## Differential Diagnosis

- Dermatitis herpetiformis.
- Erythema multiforme.
- Still disease.
- Urticaria.
- Erythema marginatum.

## Discussion

This child has urticaria, commonly called *hives*. "A hive or wheal is a circumscribed, erythematous or white, nonpitting, edematous, usually pruritic plaque that changes in size and shape by peripheral extension or regression during the few hours or days that the individual lesions exists" (Habif, 2004, p. 130). The rash evolves over a period of minutes, hours, or days, with new wheals appearing as old ones fade. The wheals may last for a few minutes to several weeks.

Hives are the result of capillary vasodilation followed by the flow of protein-rich fluid into the area; they resolve as this fluid is reabsorbed (Habif, 2004). These lesions may be very small or may become con-



**Figure 1.** Wheals on the Back



**Figure 2.** Target Lesions of Multiforme

fluent and cover the entire extremity. They are usually round or oval, but one border may be reabsorbed and give the appearance of an incomplete ring or look polycyclic. The color may be either red or white; they blanch when pressed and have a faint white halo. Itching varies from very mild to intense and is not related to how extensive the rash is over the body.

“Thicker plaques that result from massive transudation of fluid into the dermis and subcutaneous tissue are referred to as *angioedema*. These thick, firm plaques may occur on any skin surface, but usually involve the lips, larynx (causing hoarseness or a sore throat), and mucosa of the gastrointestinal tract (causing abdominal pain)” (Habif, 2004, p. 132). These thicker plaques may have a target appearance and are often misdiagnosed as erythema multiforme (EM; Figure 2). “The difference is that urticarial lesions are transient, usually lasting 24 hours or less, whereas EM lesions are fixed and stay at the same site for at least 7 days” (Weston, Lane, & Morelli, 2002, p. 157). When hives are present, it is important to check for these symptoms to be sure that angioedema is not present. The presence of angioedema may indicate a more serious problem that may require immediate attention in an emergency room, because the swelling may obstruct breathing.

When a school nurse determines that a child has urticaria and not bites or some other rash, the next concern is to determine if it is acute or chronic. Any urticarial rash that has been present for fewer than 6 weeks is considered to be acute. There are no routine laboratory tests for evaluation of acute urticaria. The school nurse should work to determine the cause by performing a complete history.

“Most cases of acute urticaria are caused by a hypersensitivity reaction to drugs, food, insect bites, contact antigens, inhaled substances, or acute infections. Physical agents, which include cold, heat, water, exercise, and mechanical pressure, also may trigger hives” (Cohen, 1999, p. 155). Dermagraphism is the creation of a hive just from stroking the skin and is considered a physical form of urticaria (Figure 3). It is the most common physical urticaria and can be dem-



**Figure 3.** Dermagraphism

onstrated in 5% of the population (Habif, 2004). With this condition, any stimulation to the skin can cause a wheal to develop, even rubbing with a towel or light stroking with a pointed object. This tendency can last from weeks to months to years, with the average course lasting 2–3 years before spontaneously resolving. Dermagraphism often occurs after viral illness or drug therapy.

Once all possible causes of the acute hives have been discussed and eliminated (Table 1), the child should be treated with an antihistamine to suppress the hives and stop the itching. Frequently, it is not possible to determine the cause of hives. If the child is very uncomfortable or antihistamines cannot be given at school, the child should be sent home. Children with hives who are attending school should be treated with a nonsedating antihistamine such as Clarinex or over-the-counter Claritin. Benadryl may be used, but will cause the child to be sleepy, even if it is given the night before. In most cases, urticaria clears spontaneously, so if the child is not having problems with itching, she or he may stay in the classroom. No further work-up is necessary unless the rash lasts longer than 6 weeks.

Children and parents should be counseled to avoid the causative agent, if one has been identified. If the causative agent is a drug, this should be noted in the child’s health record. If food is the agent, those foods should be avoided and care should be taken that the child is not served those foods for lunch or snacks. This also should be noted in the child’s record, and an Epi-pen should be kept at school if a systemic reaction or angioedema occurs when the child comes in contact with the causative agent. The Epi-pen should be administered at once if the child has contact with the agent and starts having a rash. The school nurse should call 911, and the child should be transported to the nearest emergency facility.

Children with chronic urticaria need a complete work-up to be sure they do not have a chronic illness such as Still disease or Systemic Juvenile Idiopathic Arthritis. These children often experience systemic symptoms such as fever, headache, sore throat, fatigue, and loss of appetite, in addition to the rash (Prendiville, Tucker, Cabral, & Crawford, 2004). Other diseases such as dermatitis herpetiformis also may pre-

**Table 1.** Etiologic Classification of Urticaria

**Foods:** Fish, shellfish, nuts, eggs, chocolate, strawberries, tomatoes, pork, cow's milk, cheese, wheat, yeast.

**Food additives:** Salicylates, dyes such as tartrazine, benzoates, sulfites. Aspartame (NutraSweet) probably does not cause hives (Geha and colleagues, 1993).

**Drugs:** Penicillin, aspirin, sulfonamides, and drugs that cause a nonimmunologic release of histamine (e.g., morphine, codeine, polymyxin, dextran, curare, quinine).

**Infections:** Chronic bacterial infections (e.g., sinus, dental, chest, gallbladder, urinary tract), *Campylobacter enteritis*, fungal infections, dermatophytosis, candidiasis), viral infections (hepatitis B, mononucleosis, coxsackie), protozoal and helminth infections (roundworms and malaria).

**Inhalants:** Pollens, mold spores, animal dander, house dust, aerosols, volatile chemicals.

**Internal disease:** Serum sickness, systemic lupus erythematosus, hyperthyroidism, autoimmune thyroid disease, carcinomas, lymphomas, juvenile rheumatoid arthritis (Still disease), polycythemia leukocytoclastic vasculitis, polythemia vera (acne urticaria—emurticarial papule surmounted by a vesicle), rheumatic fever, some blood transfusion reactions.

**Physical stimuli (physical urticarias):** Dermagraphism, pressure urticaria, cholinergic urticaria, exercise-induced anaphylactic syndrome, solar urticaria, cold urticaria, heat, vibratory, water (aquagenic).

**Nonimmunologic contact urticaria:** Plants (nettles), animals (caterpillars, jellyfish), medications (cinnamic aldehyde, compound 48/80, dimethyl sulfoxide).

**Immunologic or uncertain mechanism contact urticaria:** Ammonium persulfate used in hair bleaches, chemicals, foods, textiles, wood, saliva, cosmetics, perfumes, bacitracin.

**Skin disease:** Urticarial pigmentosa (mastocytosis), dermatitis herpetiformis, pemphigoid, amyloidosis.

**Hormones:** Pregnancy, premenstrual flare-ups (progesterone).

**Genetic, autosomal dominant (all very rare):** Hereditary angioedema, cholinergic urticaria with progressive nerve deafness, amyloidosis of the kidney, familial cold urticaria, vibratory urticaria.

Note. Adapted from Habif (2004, p. 134).

sent as chronic urticaria in otherwise healthy children (Powell, Bruckner, & Weston, 2004).

Recently, it has been determined that children who have chronic urticaria where no cause can be determined (chronic idiopathic urticaria) may actually have an autoimmune form of urticaria (Brunetti, Ruggiero, Miniello, Platzer, Rizzi, Lospalluti, Poulsen, Armenio, & Skov, 2004). These children may need to take a nonsedating antihistamine every day to prevent the rash and to reduce the itching. They may also need to be on an H<sub>2</sub> receptor antagonist (Cimetidine or Zantac), a leukotriene antagonist (Singulair), or a corticosteroid (Prednisone) for a therapeutic effect. Some children need combination therapy, and in children who have had no response to these approaches, immunotherapy with methotrexate or cyclosporine may be tried.

### Key Points for School Nurses

1. Determine that the rash is really urticaria and is not bites or a viral illness, and check for a physical cause by lightly stroking the arm for dermagraphism. Be sure this is not a serious drug reaction that requires immediate attention.
2. Take a thorough history, asking the student if he or she knows what caused the hives and if he or she has had them before.
3. Check for any medications the child may be taking, recent insect bites, known allergen exposure, new foods, recent infections, even chemical exposure from hair dyes, perfumes, or exposure to a plant.
4. Benadryl may be administered if it is approved in your school, or consider sending the child home for the parent to give the medication. Pro-

vide education that the Benadryl may make the child sleepy. A nonsedating antihistamine, such as Claritin (loratadine) or Allegra (fexofenadine), is preferred. Loratadine is available over the counter in the brand name or generic form.

5. Keep the child cool to reduce itching.
6. Let the child know she or he is not contagious, and the itching will resolve.
7. Children may need to keep a symptom diary to determine what is causing the hives, if they have had several episodes.

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