Papular Urticaria from Bug Bites

Papular urticaria, the unique hypersensitivity reaction to bites from bugs of various types, often go undiagnosed for a number of reasons, a recent study in Pediatrics has noted. To help physicians make the correct differential diagnosis of this condition, Bernard Cohen, MD, Director of Pediatric Dermatology at Johns Hopkins Children’s Center in Baltimore and Raquel Hernandez, MD offer the mnemonic, SCRATCH (see Table).

“Papular urticaria is quite common, people just often times don’t recognize it,” Dr. Cohen says. “Without the right diagnosis, most people will have recurrent and consistent lesions for a number of years.” Some patients are eventually subjected to unnecessary studies in order to identify the cause of the persistent, recurrent lesions. If physicians recognize the SCRATCH principles, he says, this would minimize the problem.

Treating papular urticaria resulting from bug bites can be very difficult, according to Dr. Cohen, since there are no good treatments for the condition. Most people become sensitized when bitten by the same organism—usually fleas, mosquitoes or bedbugs; when they get new bites, they have the same kind of hypersensitivity reaction, he notes.

“I’ve tried everything to treat it including low potency, mid potency, high potency topical steroids, occlusive steroids, and intralesional steroids,” he says, but none of these has worked particularly well. Therefore, he says, the emphasis should shift from treatment to education and prevention.

The first step in management is helping parents to understand and accept the diagnosis. SCRATCH guidelines note that physicians sometimes second-guess their diagnoses when parents immediately dismiss the idea. If more people become more aware of papular urticaria, they will be less likely to question physicians, and the correct diagnosis is much more likely at the outset, Dr. Cohen explains. “Once parents are taught how to recognize the skin lesions by their practitioners, three quarters of the problem would be gone,” he says.

Protection and Prevention

Future studies may explore new methods of protection and prevention, Dr. Cohen suggests, adding that these are areas about which little is currently known. Even without exact knowledge of the offending organism, there are steps patients and parents can take to provide protection and minimize bites.

An infestation must be eliminated, and any carriers must be treated. This means sanitizing clothing, bedding, and other sources of infestation and treating pets and other affected family members.

Additionally, Dr. Cohen says, it helps to keep the skin covered at night, which includes wearing long pants and long sleeves that protect the skin and decrease the number of bites. This is more crucial if the patient is outdoors but may be helpful indoors, as well.

It’s also important to urge parents to exercise caution when applying perfumes, colognes, lubricants, hair products, and other skincare products to their children. These products often have fragrances in them that attract bugs.

Insect repellents, such as DEET, can be used for outdoor use. Parents can spray repellents on a child’s clothes rather than directly to the skin.
Finally, Dr. Cohen urges patients and clinicians to remember that insect bites can occur all year round, depending on the insect. Parents and physicians may think of bug bites only in the spring and summer when temperatures are warm and children spend more time outdoors. Dr. Cohen reminds that the above tips apply in fall and winter, as well.

—Ted Pigeon, Senior Associate Editor

**Recognize and Treat Erythrasma**

Erythrasma is a frequently under-diagnosed cutaneous infection caused by Corynebacterium minutissimum. It commonly affects body folds, particularly the groin, and has been identified as one of the leading causes of interdigital foot infections. Traditionally, erythrasma has been considered to more frequently affect individuals living in warmer climates, though it can occur at any latitude. Along with candidiasis, intertrigo, candida folliculitis, furunculosis, tinea cruris, and folliculitis, erythrasma has been reported to occur with increased incidence among obese individuals and those with diabetes. However, the infection may also be common among athletes, particularly when affecting the toe webs. About 15 percent of cases occur in children, with increasing incidence as individuals age into adolescence.

Among other cutaneous diseases, the differential diagnosis of erythrasma includes cutaneous fungal infections, including pityriasis rotunda, tinea corporis/cruris, tinea pedis, and pityriasis versicolor. Importantly, erythrasma may coexist with dermatophyte infections. Proper diagnosis of erythrasma and any concomitant skin infection(s) is essential for initiation of appropriate therapy targeted at all causative organisms. Topical anti-infective therapy, including broad-spectrum ketoconazole, is typically sufficient to manage the condition, although systemic antibiotics have traditionally been advocated and may be indicated for severe or refractive cases.

**Presentation and Prevalence**

Erythrasma is a bacterially mediated scaly skin eruption typically localized to warm, moist skin folds. The rash tends to be deep red to brown in color and is not typically associated with significant pruritus. Erythrasma was once improperly considered a fungal infection, though research over the past 50 years has confirmed the role of *C. minutissimum* in its pathogenesis. These gram-positive bacteria are typically part of the normal resident flora of human skin. In 1965, Montes, et al. evaluated biopsied skin from patients with erythrasma absent any concomitant fungal etiology. They found *C. minutissimum* dispersed over the skin surface, between and penetrating superficial cornified cells, and within keratinized cells. Their investigation showed that the stratum corneum of affected patients was hyperkeratotic, and identified likely keratolytic processes associated with the presence of intracellular bacteria.

Erythrasma generally is diagnosed through visualization, but it may be mistaken for candidiasis, intertrigo, psoriasis, seborrheic dermatitis, contact dermatitis, or...
dermatophytosis. Luminescence with a Wood’s Lamp reveals a coral pink fluorescence that confirms the presence of *C. minutissimum* and supports the diagnosis. The diagnosis may be missed if the patient has bathed in previous 24 hours; bathing may wash away coproporphyrin III, the pigment produced by *C. minutissimum* that causes fluorescence. Fungal culture may be used to rule out concomitant fungal infection.

Erythrasma has been found to have a higher prevalence in diabetics and the obese.1,2

**Treatment Options**

Erythromycin 250mg four times daily for 14 days is described as the systemic antibiotic treatment of choice for erythrasma.1 Yet systemic antibiotics are described as a third-line treatment option for erythrasma, and they confer limited efficacy for affected toe webs.6,11 As physicians have become increasingly aware of antibiotic resistance and its potential long-term impact on patient care, there have been efforts to reduce the use of systemic antibiotics. Furthermore, systemic medications in general tend to present a greater risk of side effects and/or drug interactions compared to topical agents. Given that erythrasma is a generally benign condition, the use of systemic antibiotics as first-line therapy becomes questionable.

Topical antimicrobial therapies are second-line choices for erythrasma management.9 Topical antibiotic preparations have not been shown to be very effective for erythrasma in the published literature. However, antimicrobial fusidic acid ointment 2% has demonstrated efficacy, as has Whitfield’s ointment (salicylic acid and benzoic acid).10 Whitfield’s ointment reportedly has similar efficacy to systemic erythromycin for erythrasma affecting the axillae and groin and is superior to the oral agent in the interdigital areas.1

Despite the potential efficacy of the topical antimicrobial ointment preparations, they are not ideal in the clinical setting. They may lack cosmetic elegance and thus be associated with low adherence. Most patients are unwilling to apply thick, greasy preparations to intertriginous areas or toe webs.

Although a role for dermatophytes, yeasts, and molds in the pathogenesis of pure erythrasma has been disproven, topical antifungal formulations have been used with success to manage the condition and are described as first-line treatment options.9 Topical miconazole,12 clotrimazole,13 and econazole9 have all been shown effective for erythrasma. In one trial involving 61 patients with fungal infection or erythrasma, subjects were randomized to use topical tioconazole base 1% w/w or econazole nitrate 1% creams for a mean treatment period of 40 and 38 days respectively.14 All but two patients in each arm achieved clinical and mycological cure and described treatment as generally acceptable, though mild intermittent pruritus was reported with econazole. Again, creams may not be ideal for use in skin folds and interdigital spaces.

A new ketoconazole foam 2% formulation (Extina, Stiefel), has been a welcome new treatment option for erythrasma. The foam vehicle (VersaFoam HF) is a hydroethanolic formulation that is neither hydrating nor drying. It is designed to rapidly dissolve at skin temperature leaving little to no residue. As such, it is ideal for application to skin folds. The foam can be easily applied to various body sites large and small and is readily applied to hair-bearing skin, making it suitable for use in the axilla and hair-bearing chest.
and abdomen. It is also easily and comfortably applied to the toe webs.

Ketoconazole has long been recognized as having a broad spectrum of activity.\textsuperscript{15} It confers documented anti-inflammatory and antibacterial effects.\textsuperscript{16}

An added benefit of topical ketoconazole for the management of erythrasma is that the broad-spectrum antifungal will address any concomitant fungal component of the presentation, eliminating the need for culture and optimizing the likelihood of complete cutaneous clearance.

Prevention
To reduce the likelihood of recurrence of erythrasma, patients must make efforts to reduce bacterial colonization and minimize moisture in the skin folds. The use of antibacterial washes has been recommended, though no published data are available. Advise patients to thoroughly dry the skin after bathing.

Although standard laundering practices are expected to prevent bacterial colonization of clothing, bacteria may, like dermatophytes, colonize moist footwear.\textsuperscript{3} Patients with erythrasma involving the toe webs may need to disinfect or replace shoes to eliminate exposure to bacteria. Once clear, patients should be advised to allow their shoes to thoroughly dry between wearing, perhaps alternating footwear every-other-day, if needed to allow drying.

Patients with a history of recalcitrant or recurrent erythrasma may be directed to prophylactically apply topical ketoconazole foam to previously affected areas once daily.\textsuperscript{13}

—Joseph Bikowski, M D

22. Jung, P., et al., The extent of black henna tattoo’s complications are not restricted to PPD-sensitivity. Postgraduate Medicine, 2008 116(3).