Common Child and Adolescent Cutaneous Infestations and Fungal Infections

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Cutaneous infections and infestations are common among children and adolescents. Ectoparasitic infestations affect individuals across the globe. Head lice, body lice, scabies, and infestations with bed bugs are seen in individuals who reside in both resource poor areas and in developed countries. Superficial cutaneous and mucosal candida infections occur throughout the life cycle. Dermatophyte infections of keratin-containing skin and skin structures result in tinea capitis (scalp), tinea corporis (body), tinea pedis (foot), and tinea unguium (nails). Less frequent endemic fungal infections such as blastomycosis, coccidiodomycosis, and histoplasmosis may present with skin findings. This article will describe the epidemiology and transmission of these conditions as well as their clinical manifestations. The approach to diagnosis will be addressed as well as primary prevention and current therapies.

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Introduction

Human cutaneous infestations and infections are widespread throughout the world. Ectoparasitic organisms live on the surface of the host. Lice, scabies, and bed bugs infest children and adolescents in the developed world and are highly prevalent in resource poor populations. These infestations may be associated with considerable morbidity. Fungal infections of the skin and mucous membranes occur in all age groups. Candida yeasts normally reside in the intestinal tract and can be found on mucous membranes and skin without causing infection. Candidiasis results from overgrowth of the organism. Symptoms of candidiasis vary depending on the area of the body that is infected. Certain fungi invade and proliferate in keratin-containing layers of the integument. These fungal pathogens predominantly infect the hair, skin, and nails (dermatophytes) and cause the most common mycotic cutaneous diseases (dermatophytoses) worldwide. While far less frequent, one might encounter patients who present with cutaneous manifestations of endemic fungal infections (coccidiodomycosis, blastomycosis, or histoplamosis). This article describes the epidemiology of these conditions, their clinical presentation and approach to diagnosis. Current treatment recommendations and primary prevention will also be addressed.

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Infestations

Bites and infestations represent common complaints among the pediatric population presenting to both primary care clinicians and dermatologists. While these infestations are not life-threatening, they can cause significant physical and psychologic distress. Once a child is diagnosed as having head lice, scabies or bed bugs, he or she may be stigmatized, leading to social isolation. Primary care clinicians play a pivotal role in both the diagnosis and treatment of these problems. This article reviews the epidemiology, clinical presentation, methods of diagnosis and treatment recommendations of

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FIG 1. Bedbugs.

these three common conditions: bed bug infestation, scabies infestation, and head lice.

Bed Bugs

Bed bugs are wingless ectoparasites belonging to the family Cimicidae and include the subtypes *Cimex lectularius* (common bed bug found in temperate climates) and *Cimex hemipterus* (found in warmer climates).[1] The common bed bug is reddish-brown in color, oval and flat in shape with 3 pairs of legs, and typically ranges between 3 and 6 mm in length (Fig 1).[1,2] Its average life span is approximately 6–12 months and consists of five nymphal stages prior to reaching adulthood. Nymphs are much smaller in size and lighter in color than adults but are still visible to the naked eye. Bed bugs are nocturnal and typically hide in inconspicuous locations such as underneath mattresses, inside cracks and crevices or behind wall coverings during the day. These insects are hematophagous and require blood meals from either mammals or birds, depending on the species. They can, however, survive months to even years without feeding.[1] Although controversial, bed bugs are generally not thought to act as vectors for transmission of infectious diseases including HIV and hepatitis B.[1,3] However, there is growing concern these parasites may transmit antibiotic-resistant bacteria including MRSA and further studies on this subject are needed.[4]

Over the past few decades, bed bug infestations have been on the rise in the United States as well as in other countries.[5] For example, the number of reports of bed bug infestations in San Francisco more than doubled between 2004 and 2006.[6] Another study found that 1 in 5 Americans reported a bed bug infestation in their home or they knew someone who encountered bed bugs at home or in a hotel.[7] This resurgence is attributed to many factors, including increase in worldwide travel and resistance to commonly used pesticides.[8]

Victims of bed bug bites typically present with multiple pruritic, erythematous papules on exposed areas such as the head, neck, arms and legs. Papules tend to be grouped or in linear array giving rise to the characteristic "breakfast, lunch, and dinner" sign and may have a central hemorrhagic punctum[9] (Fig 2). The characteristic eruption is thought to result from the host's immune response to salivary proteins released during feeding.[10] Bed bug infestation should still be considered even when some household members do not report bites as it is possible for only one or a few household members to be afflicted.[11] Some individuals may develop bullous or urticarial reactions at bite sites and rarely may even progress to anaphylaxis.[12,13] Secondary infection may result from scratching bite sites.

Diagnosis of bed bug bites is primarily made by suggestive history and physical exam findings. Occasionally, bed bugs may be observed on the patient or patient's clothing during examination. Skin scrapings prepared in mineral oil may be examined to rule out other infestations such as scabies. Although typically not necessary for diagnosis, a skin biopsy may show histopathologic changes consistent with arthropod assault. The differential diagnosis should include flea bites when lesions are located primarily on the lower legs, other arthropod assaults, scabies and urticaria from other contactants or allergens.

Treatment of bed bug bite reactions is symptomatic and includes low- to medium-potency topical corticosteroids (hydrocortisone, fluocinolone, triamcinolone, or desonide creams), topical antipruritic agents (pramoxine and calamine lotion), and oral antihistamines. In general, topical steroids should be used for no longer than 2 weeks at a time. Sites that are secondarily infected should be treated with topical or oral antibiotics such as mupirocin ointment. The most important intervention, however, is eradication of the bed bug infestation and elimination of potential sources. Because *C. lectularius* is much more

FIG 2. "Breakfast, lunch, dinner "sign from bedbug bites.