

# Scabies

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An 8-year-old boy presented to the pediatric continuity clinic with an itchy rash that had been present for a few weeks.

The boy's mother had suspected that the rash was a result of a bed bug infestation, and she had changed all of the bed linens and had treated the boy's rash with a corticosteroid ointment, but without any improvement. The rash had started on his upper extremities but had spread to his trunk and lower extremities. The rash was extremely itchy and consisted of small bumps. There was no history of similar rash. The boy was otherwise healthy and was developing appropriately. He lived with his single mother. There was no history of pets in the house.

On examination, the patient was afebrile, well nourished, and well developed. Physical examination findings were unremarkable apart from the rash. Of note was a papular rash on the

Examination findings were unremarkable apart from the rash. Of note was a papular rash on the distal upper and lower extremities, involving the interdigital spaces, but sparing the palms and soles (**Figures 1-5**). A similar rash was present on the trunk and back (**Figures 6 and 7**). There were multiple excoriations in the areas of the rash but no secondary bacterial infection.



**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**



**Figure 5**



**Figure 6**



**Figure 7**

Examination of scrapings of the lesions under light microscopy showed the 8-legged mites, eggs, and stool characteristic of scabies infestation. The patient was given permethrin lotion, 5%, to be applied for 8 to 12 hours and repeated 2 weeks later. The mother was also advised to treat herself similarly and to wash all clothes and bedclothes in hot water.

The patient returned 2 months later and reported that, after an initial slight improvement, the rash had persisted and was treated with another 2 weeks of permethrin. Again, adherence to and correct application of the topical permethrin, as well as fomite care, were discussed in detail with the family.

The patient returned 6 weeks later and reported that the rash and itching had persisted. He was suspected to have resistant scabies and was treated with a 6-mg dose of oral ivermectin, to be repeated in 2 weeks. The patient's symptoms resolved with this treatment in 2 weeks.

## **DISCUSSION**

Scabies is an intensely pruritic skin infestation caused by the mite *Sarcoptes scabiei* var *hominis*. This obligate human parasite is a worldwide public health problem. It is usually transmitted through direct, prolonged contact with an infested person. However, transmission through bedding and clothing may occur, because the mites can survive for up to 3 days on such fomites.

The mites live in the epidermal layers of the skin. As they travel, they secrete proteases and feed on necrotic tissue. The feces (scybala) left behind create the pathognomonic linear lesions. The female mites lay numerous eggs in the deeper layers of the epithelium, while the male mites die after copulation. Given that less than 10% of the eggs develop into mature mites, an infested person typically has fewer than 100 mites

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Typically, within 4 to 6 weeks after infestation, a type IV hypersensitivity reaction to the mite, its eggs, or its feces develops in the host. This produces the severe itching that is the hallmark of scabies. Hypersensitivity responses may develop more rapidly (within days) in repeated infestations. The rash consists of papules, vesicles, pustules, and nodules.<sup>1</sup> Scratching the lesions can cause ulceration with secondary bacterial infection, and impetigo is a common complication of untreated scabies.

Adults manifest lesions primarily on the interdigital web spaces of the hands, flexor aspects of the extremities, waist, buttocks, and genitalia. Lesions in infants and small children may be more diffuse. In neonates, who are unable to scratch, an eczematous rash or large nodules may develop.

Scabies is usually diagnosed clinically. An intensely pruritic rash that is worse at night, that has the classic distribution of lesions, and that is present in other family members should raise suspicion for scabies. In typical cases, examination of scrapings of the lesions under light microscopy can confirm the diagnosis. This shows the typical 8-legged mites or their eggs.

Treatment of scabies must include all family members and close contacts, even if they have no symptoms, since they may not have yet developed the hypersensitivity reaction.<sup>2</sup> Because the mites can survive outside the host for 48 to 72 hours, items used within the previous 3 days should be placed in a plastic bag for at least 72 hours. Clothes and bed linens should be washed in hot water (at least 60°C) and then machine dried. Numerous prescription drugs have been approved as scabicides in the United States, but resistance to conventional therapy is increasing around the world. No nonprescription over-the-counter product has been approved to treat human scabies.

The treatment of choice in children aged 2 months or older is permethrin cream, 5%.<sup>3</sup> It kills the scabies mite and its eggs and is applied over the body and face, left on for 8 to 14 hours, and washed off. Two (or more) applications approximately a week apart may be necessary to eliminate all mites. Other options include topical benzyl benzoate applied for 2 or 3 consecutive days (which may cause immediate skin irritation), or topical malathion applied for 24 hours on 2 days 1 week apart. Lindane cream and lotion are no longer used, because systemic absorption of the drug can cause neurotoxicity in children. Oral ivermectin should be considered for patients whose scabies have not responded to conventional treatment. Two doses (200 µg/kg/dose) should be taken with food approximately 1 week apart. However, note that ivermectin is not approved by the Food and Drug Administration for this use. The safety of ivermectin in children weighing less than 15 kg and in pregnant women has not been established.

Symptomatic treatment with oral antihistamines and topical antipruritics or corticosteroids may be necessary even after the mite is eliminated as a result of persistent hypersensitivity to the

be necessary even after the mite is eliminated as a result of persistent hypersensitivity to the dead mite and its feces. Persistent signs and symptoms after treatment can be due to incorrect diagnosis, nonadherence to or inadequate or incorrect application of scabicides, local reaction to scabicides, postscabetic reaction to the mite or its products, reinfection, or resistance.

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