Scabies Surveillance, Prevention, and Control

Scabies is a contagious parasitic disease (infestation) of the skin caused by the human itch mite, Sarcoptes scabiei var hominis. Scabies affects only humans and does not discriminate based on socioeconomic level, gender, ethnicity, age, race, sexual orientation, or personal hygiene habits.

The life cycle begins when a female mite leaves the human skin, its life is terminated in about 3-4 days. During bathing or other actions such as scratching. Once a female mite leaves the human skin, its life is terminated in about 3-4 days. The egg is deposited in the outer layer of the host’s skin. A fertile female can lay about three eggs each day. The eggs hatch in 3-4 days, producing larvae that migrate to the surface of the skin, dig another burrow, and feed on intracellular fluids. Over the next 7-10 days, the larvae develop into sexually mature adult mites. This cycle is repeated many times during the 2-month lifespan of the female mite. The male mites have a very short lifespan (1-2 days) that is spent seeking out unmated females. In healthy persons, fewer than 10% of the eggs live long enough to reach adulthood. Most of the eggs are removed from the skin during bathing or other actions such as scratching. Once a female mite leaves the human skin, its life is terminated in about 3-4 days.

The severity of the infestation is related to the number of mites residing on the skin and the length of time between the initial infestation and subsequent treatment. Diagnosis and treatment are delayed, the number of mites multiplies daily, resulting in progression of the infestation from a typical or classic form (eg, fewer than 50 mites on the skin) to a heavier or atypical infestation. Keratotic or crusted scabies, sometimes referred to as Norwegian scabies, was first described in persons diagnosed with leprosy in Norway. This severe form of scabies is generally characterized by thick, crusty skin lesions. Embedded within these crusts are thousands to millions of live mites. There are several physiological and immunological conditions—including renal failure, insulin-dependent diabetes, severe mental retardation, malnutrition, acquired immunodeficiency syndrome (AIDS), T-cell leukemia, and immunological conditions. Scabies, sometimes referred to as Norwegian scabies, was first described in persons diagnosed with leprosy in Norway. This severe form of scabies is generally characterized by thick, crusty skin lesions. Embedded within these crusts are thousands to millions of live mites. There are several physiological and immunological conditions—including renal failure, insulin-dependent diabetes, severe mental retardation, malnutrition, acquired immunodeficiency syndrome (AIDS), T-cell leukemia, and the administration of topical and systemic corticosteroids—1,3—that can hasten the progression of the infestation.

Recognizing Scabies

Healthy persons with no history of previous infestation will have no signs or symptoms immediately after initial exposure. The incubation period is usually 2-5 weeks, but can range from 10 days to 3 months. The presence of pruritus (itching) is a key indicator of scabies. Symptoms may include:

- Intense pruritus: The most common symptom, occurring in nearly all cases of scabies.
- Red or brown-colored skin: Often seen in areas where the skin has been scratched, such as the hands and feet.
- Small, red papules: These small, raised bumps may be present in various locations on the skin, particularly in folds or creases.
- Tiny burrows: Small, dark-colored lines on the skin, often found on the wrists, fingers, and around the nails.
- Crusty or scaly patches: These areas may be thick and scaly, appearing similar to athlete's foot or dandruff.
- Nighttime itching: Pruritus may be worse at night, especially when the person is not actively scratching.

Whisper the word scabies in any long-term care facility, and there is immediate panic associated with effective scabicide. (Annals of Long-Term Care: Clinical Care and Aging 2009;17[4]:31-35)
Following an exposure and during the initial 3-6-week incubation period. Following the incubation period, the infested person will complain of pruritus, which intensifies at bedtime. Pruritus is a cell-mediated hypersensitivity (allergic) response to the mites, eggs, and feces embedded in the skin. In previously infested persons, pruritus may be noticeable as soon as 48 hours following exposure. The areas of the skin most affected by the mites include the webs between the fingers, buttocks, genitalia, under the folds of women’s breasts, flexor surfaces of the wrists and elbows, and axillae. In bedridden residents, lesions may be more prominent on the back, buttocks, and the backs of the legs.

The affected skin areas are generally inflamed with nonspecific raised bumps and small, almost microscopic, short, gray, slightly elevated lines or burrows. If the skin is not excoriated due to scratching, burrows with associated vesicles can sometimes be visualized with a magnifying lens. To review the many visual presentations of both typical and atypical scabies, the reader is referred to http://www.lib.uow.edu/AHRDIN/MDiscabies.html.

The rash may mimic other dermatological conditions, including eczema, drug reaction, impetigo, folliculitis, dermatitis herpetiformis, pyoderma, tinea, pityriasis, psoriasis, syphilis, mycosis fungoides, lupus, acute urticaria, insect bites, and contact dermatitis. The excoriated skin lesions may become secondarily infected with Staphylococcus aureus (including methicillin-resistant Staphylococcus aureus) or Group A streptococci.

Transmission

The scabies mite is transmitted from person to person by direct contact with the skin of the infested person. Atypical or crusted scabies may also be transmitted by wearing an infested person’s clothing (fomites) such as sweaters, coats, or scarves. Activities such as performing physical assessments and bathing are conducive to transmission because physical contact is often prolonged. Transmission may also occur between residents during social or recreational activities. Inanimate objects such as bed linens, personal items, and fabric-covered chairs or sofas will play little, if any, role in transmission if the infestation is typical. However, residents with atypical or crusted scabies can shed an estimated 7000 live mites into the environment every 2 days, increasing the risk of transmission from an environmental source.

Controlling the Outbreak

The Centers for Disease Control and Prevention (CDC) currently recommends contact precautions until 24 hours after initiation of effective therapy. However, current treatment recommendations for atypical or crusted scabies may require several treatments, and severely infested residents may not be rendered noncontagious for several weeks. Therefore, residents with crusted scabies should be placed on contact precautions in a single-bed room until at least three consecutive skin scrapings are negative and symptoms have resolved.

Precautions for recently exposed symptomatic residents and their asymptomatic contacts should include gowns and gloves during the treatment period. Personal clothes, wheelchair pads, pillows, and blankets can be either washed, sealed in a plastic bag for 5-7 days, placed in a hot dryer, or dry-cleaned. Residents should put on clean clothes at the end of each treatment. Environmental surfaces including wheelchairs, walkers, bed frames, tables, chairs, blood pressure cuffs, walking belts, and other equipment and surfaces should be cleaned and disinfected with an Environmental Protection Agency.
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(EP)-registered product approved for use in healthcare facilities. Cloth or fabric-covered furniture may need to be sequestered for 5-7 days. Topical creams, ointments, and lotions should be discarded.7 Carpets should be vacuumed, and the bag should be immediately discarded. Hands should be washed after contact with each resident, with their environment, and after removing gloves.

Treatment

The most common source of a scabies outbreak is the resident admitted with undiagnosed, untreated, or improperly treated atypical or crusted scabies. If the infestation is not recognized promptly, within 3-6 weeks new complaints of symptoms (rash and/or itching) are likely to occur sporadically throughout the facility in residents, healthcare workers, and staff who provide indirect care, such as housekeepers, laundry personnel, administrative staff, visitors, and volunteers. Because an untreated contact may be infested and transmit scabies prior to becoming symptomatic, continuous transmission can occur over a prolonged period of time. Ridding scabies from the facility then becomes a long, protracted, and costly ordeal.

Controlling transmission9,10 often involves a choice between treating only symptomatic residents and their identified contacts (contact prophylaxis), or treating all possible contacts (mass prophylaxis). There is limited published information on which to base any recommendation. Mass prophylaxis can be almost entirely avoided if there is a high index of suspicion and appropriate steps, including an assessment of the resident’s skin and symptoms, are implemented at the time of admission (Table III).

For mass prophylaxis to be cost-effective, the decision to choose it should be made as soon as possible after an outbreak is suspected. Key factors favoring mass prophylaxis include the length of time an undiagnosed, nonisolated case has been in the facility, the mobility of the infested resident, and the number of symptomatic cases occurring in other residents and staff within a 2-6-week period (Table IV).

Until recently, the treatment for scabies was 1% gamma-hexachlorocyclohexane. However, the mites have become increasingly resistant to this product, and it is no longer recommended. Additionally, neurotoxicity has been reported following a single application.12,13

Permethrin 5% Cream

For recent exposures and residents considered to have typical or classic scabies, permethrin cream, when applied as directed, is approximately 90% effective after one application. However, a second application 7-10 days after the first may be necessary to ensure complete eradication.14 Permethrin has a low rate of side effects that may include burning, stinging, or itching immediately following the application.12 Animal studies have shown no adverse effects to reproductive function or to the fetus; however, studies have not been conducted on pregnant women. Therefore, permethrin should be used during pregnancy only if there is a clear indication for treatment. Breastfeeding should be discouraged during the treatment period. Permethrin is safe for children two months of age or older.13

If permethrin is selected, all symptomatic residents and their close contacts including staff should be treated within the same 24-48-hour period. Healthcare workers should apply permethrin to themselves and household contacts at the end of the work shift, shower after 8-12 hours, and return to work as scheduled. The question of treating asymptomatic staff who have had no or rare contact with a symptomatic case is challenging. However, approval for one application of a topical scabicide should be granted, if requested.9

Healthcare workers should be trained in the proper application of the topical scabicide. Permethrin should be massaged into the entire area of the skin from the hairline to the feet, including the palms of the hands and soles of the feet and under the fingernails and toenails.4 In rare instances, the infested scalp may need to be treated.2 Topical scabicides should be reapplied frequently throughout the 8-12-hour treatment period to areas of the skin exposed to moisture, including urinary and fecal incontinence, and after hand hygiene. After the treatment period, residents should be bathed or showered to remove the scabicide, and bed linens should be changed.2,8

If treatment with permethrin has been effective, the intensity of pruritus and rash should gradually resolve over a 7-14-day period. If signs and symptoms persist or intensify, or if new lesions are identified, treatment failure should be considered.8 Dermatologists recommend applying 1% hydrocortisone cream or triamcinolone cream (0.1-0.025%) to the most intense areas of pruritus. Steroid creams should not be applied until after the scabicide has been removed. Antihistamines may also be effective in relieving some of the symptoms.2

Ivermectin

Ivermectin is an antiparasitic agent that has been used extensively to treat river blindness (onchocerciasis) in Africa. The drug is not approved by the U.S. Food and Drug Administration in the treatment of scabies; however, there is increasing literature to support its use.13

Currently, for typical scabies, the CDC recommends either permethrin cream or ivermectin 200 ucg/kg initially. A second dose of ivermectin 2 weeks after the initial dose increases the cure rate to 95%-14,15 Limited information on the half-life of ivermectin in the blood suggests that the duration of protection from re-infestation after administration is short (eg, less than a week).15 Ivermectin, either alone or in combination with a topical scabicide such as permethrin, is the treatment of choice for crusted scabies in immunocompromised patients.12

Ivermectin adverse reactions may include nausea, rash, dizziness, itching, abdominal pain, fever, and increased heart rate.12 These symptoms may be due to the release of large numbers of antigens following the death of the scabies mite, rather than a reaction to the drug itself. Ivermectin is not recommended for use in children less than 33 pounds or in pregnant or nursing women.13

Post-Treatment Assessment

There are a number of reasons for the continued propagation of new cases in healthcare facilities. The most common reason is delayed recognition of the index case.1 Other reasons include: (1) continued contact with untreated or unsuccessfully treated residents and healthcare workers; (2) failure of residents who have immunosuppressive diseases such as AIDS to respond appropriately to the scabicides; (3) continued use of topical and oral steroids during the treatment period(s);1,3; and (4)

http://www.annalsoflongtermcare.com/content/scabies-surveillance–prevention–and–control
failure to kill the scabies mite in clothing, upholstered furniture, or carpeting. 2, 5 If scabies control measures have been successful, an endpoint for the outbreak should be evident within 6–12 weeks (2 incubation periods) after the last case has been identified. 9

Summary

Outbreaks of scabies have been reported in acute care hospitals and long-term care facilities, and have involved both patients and staff. In the studies reviewed, the single most important cause of the outbreaks was failure to observe and document the condition of the skin at the time of admission and take immediate and appropriate action to diagnose, treat, and prevent transmission. To prevent outbreaks, facilities should develop a written scabies outbreak control plan; train healthcare workers to recognize, document, and report the condition of residents' skin at the time of admission, and frequently thereafter; implement barrier precautions for residents with suspicious rashes or symptoms; perform diagnostic tests; and treat cases and their contacts with an effective scabicide.

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References:


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