Brief Report

Persistent Scabies in Nursing Home Patients

Sandra J. Paules, MD; Dianne Levisohn, MD; and Warren Heffron, MD
Albuquerque, New Mexico

Persistent scabies outbreaks in extended care facilities result from multiple factors: atypical presentations in the elderly, leading to delayed or inaccurate diagnosis; incomplete or ineffective treatment of the patient and exposed population; and failure to coordinate notification, education, treatment, and disinfection. A case report of scabies in an elderly resident of an extended care facility illustrates various types of scabies manifestations, the advisability of obtaining diagnostic scrape preparations, and the efficacy and safety of permethrin. Guidelines for an aggressive and comprehensive effort for eradication are offered.

Key words. Scabies, nursing homes; aged; mite infestations. (*J Fam Pract 1993; 37:82-86*)

Scabies is a disease that has plagued man throughout recorded history. It is caused by the parasitic mite *Sarcoptes scabiei var hominis* burrowing and laying eggs in the stratum corneum of the skin. Classically, patients present with pruritic burrows, papules, and vesicles (Figure 1) in a typical distribution. It is most frequent in young children, and the incidence sharply declines after early adulthood.[1] However, the elderly can be at risk for infestation because of host factors, eg, dementia, chronic illness, compromised immune system, and environmental factors, such as overcrowding and the close bodily contact required in caring for paralyzed or bedridden patients. These factors and aging of the skin can lead to atypical presentations of scabies, resulting in delay in recognition and treatment and thus extended exposure to a closed population. Eliminating *Sarcoptes scabiei* from residential institutions may be more complicated and difficult than one might expect. We present an example of a nursing home infestation, and review important guidelines for eradicating difficult infestations.

Case Report

In December 1990, a 76-bed nursing home in New Mexico consulted our dermatology department concerning a scabies infestation that had persisted for 9 months. The index patient, an 87-year-old woman with an organic brain syndrome, had been transferred from another nursing home in April 1990. At the time of admission, she was noted to have a dermatitis of undetermined cause. Initially, she had a papulovesicular rash on her chest that later spread to her arms and legs. After several months, her primary physician made a clinical diagnosis of scabies. She was treated twice with gamma benzene hexachloride (GBHC, 1% lindane). Her roommate and symptomatic patients in the same corridor were the only other persons treated.

The index patient's scabies did not resolve after treatment, but progressed to a total body rash with many pustules considered empirically to be caused by a secondary bacterial infection. By the time our dermatology department was consulted, she had been treated with GBHC four times, fluocinonide (a fluorinated corticosteroid), erythromycin, neosporin, and permethrin.

Examination of her skin revealed unusual manifestations of scabies: grouped erythematous pustules and excoriations on her back, trunk, and both legs, and generalized xerosis. Microscopic evaluation of scrapings from the pustules revealed a female mite, ova, and fecal debris (scybala).

Ten other residents with pruritus or rash, or both, were also examined; mites, ova, or scybala were found on scraping preparations from five of the residents. Five of the ten had been previously treated with GBHC and yet four of those had positive scrapings. Many residents had

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Dr Paules is in private practice in Albuquerque, New Mexico. From the Departments of Dermatology (D.L.) and Family, Community, and Emergency Medicine (W.H.), University of New Mexico, Albuquerque. Requests for reprints should be addressed to Sandra J. Paules, MD, 1111 Roadrunner Lane, NW, Albuquerque, NM 87107.

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Figure 1. Scabies burrows and associated vesicles in elderly patient.

unusual presentations, with atypical distributions (ie, back and scalp) and uncommon lesions, such as bullae and plaques. Secondary excoriations, infections, eczema, and xerosis also confounded the diagnosis. In fact, one resident had been misdiagnosed by a dermatologist as having bullous pemphigoid and had been treated with prednisone (Table 1).

Since four of the five residents previously treated with GBHC tested positive for scabies, permethrin 5% cream was chosen for treating this infestation. Permethrin was applied to all skin from head to soles, left on 8 to 14 hours (overnight), and then removed by bathing. The treatment was repeated 7 days later.

To prevent reinfestation, a coordinated effort was made to notify, educate, and simultaneously treat *all* nursing home residents, staff (involved in direct or indirect care), frequent visitors, and relatives, whether symptomatic or not. Symptomatic members of the households of any of the above persons (eg, the nurse's husband) were also treated. The nursing home beds, floors, and furnishings were cleaned and disinfected. Sheets and bedding were removed, laundered, and stored unused for 3 days, since host-free mite survival time is usually 1 to 3 days.

The outcome of this major endeavor was gratifying. Follow-up approximately 1 month later revealed no clinical or diagnostic evidence of scabies. Two years later, the nursing home was still mite-free. Because of the delay in appropriate management, the conquest of this tiny mite required considerable effort and expense. New bedding was procured in this case, adding to the cost. Staff overtime and additional cleaning and treatment personnel were another major expense. The nursing home administration estimated the overall cost of eradicating the persistent scabies at $8000.

Discussion

There are several accounts documented in the literature of scabies in nursing homes and residential institutions.[1–14] Scabies is common in nursing homes even if high standards of cleanliness are maintained. Over an 8-year period, the Iowa Public Health Department confirmed scabies infestations in 25 nursing homes.[6] Scabies incidence in the United States increased in the 1970s and this higher level continues.[15] Among residents in one Florida nursing home, a 47% prevalence of scabies was found despite very good standards of environmental and patient cleanliness.[10] In fact, transmission of the mites by contact with clothing, furniture, or floor is probably less likely in a nursing home than in private homes.[15] The most critical factor for transmission is frequency and duration of direct physical contact with an infested person.[10]

Scabies is often introduced to extended care facilities by newly admitted residents and residents transferred from other institutions.[3,6,13] Skin disruptions may not be evident during the incubation period; therefore, residents may be asymptomatic for up to 4 to 6 weeks.[10] Scabies may also enter facilities through visitors and staff.

Table 1. Six Confirmed Scabies Cases in a Nursing Home

Age (y)/Sex	Lesions	Distribution	Comment
87/F	Grouped erythematous pustules and vesicles	Total body, scalp	Prior treatment with topical steroids
91/F	Bullae, erythematous papules	Arms, chest	Misdiagnosed as bullous pemphigoid and treated with prednisone
89/M	Scale, plaques, nodules, papules	Arms, back, axillae	
85/M	Erythematous excoriated papules, burrows	Trunk, hands	
84/M	Erythematous, edematous papules, plaques	Trunk, axillae	Misdiagnosed as reaction to a drug
79/F	Excoriated papules, burrows	Total body	

A nursing assistant was the index case in one nursing home plagued by intermittent scabies epidemics over a period of 5 years, resulting in the bankruptcy and closing of the facility.[14] Visiting health personnel such as physical therapists provide the potential for widespread transmission of the mite to several institutions.[6,14]

Clinical Features

Scabies may flourish undetected for months in extended care patients. The primary symptom is pruritus, especially nocturnal. The itch may vary from negligible to intense, and many patients are quite miserable. However, scratching may be misinterpreted by staff as behavior associated with the dryness typical of aged skin, or with senility.[10] Pruritus in the absence of skin lesions may be a clue to scabies.

Clinically, the presentation of scabies in the elderly can vary so much from the classic description that some have suggested that the disease in this population should be a distinct subset.[12] Classically, scabies lesions are tiny 3- to 15-mm linear burrows,[16] with associated vesicles and papules distributed on finger webs, flexor aspects of wrists, elbows, axillae, beltline, buttocks, inframammary folds and nipples in women, and genitals in men.[10,12] A widespread hypersensitivity eruption may occur 4 to 6 weeks after the initial infestation[1] and days after reinfestation.[14] In the elderly, however, lesions may be inconspicuous, atypical, or nonspecific. In addition to classic lesions, there may be pustules, bullae, plaques, nodules, scales, and hyperkeratotic crusts. Distribution is often unusual, owing to the thinness of aged skin and the disabilities of some elderly patients. There may be no site preference discernible. Warm skin temperatures increase burrowing and egg-laying activity. As a result, in bedridden patients, the back, sacrum, legs, and even scalp may be affected, and the itch may be continuous rather than typically nocturnal (as in ambulatory patients).

Complications

Complications resulting from scabies are common in the elderly. Excoriations can lead to pustules and impetiginous lesions of secondary infection or pyoderma with *Staphylococcus aureus* and streptococci. Staphylococcal infections have caused cellulitis, abscesses, lymphangitis, and lymphadenopathy (which may be suppurative).[1] Streptococcal infections have led to acute glomerulonephritis and fatal pericarditis.[17] Secondary eczema may be exudative, scaly, or lichenified.[1] Furunculosis and folliculitis are other possible complications.

Crusted (Norwegian) Scabies

A rare manifestation of scabies, called crusted or Norwegian scabies, is particularly important to consider in patients residing in extended care facilities. First described in Norway in 1848[1] and caused by the same mite, it represents neglected, chronic, and extremely florid scabies in an impaired host. A patient with crusted scabies may have millions of *Sarcoptes scabiei* mites,[1,18] whereas a typical scabies patient is infested on average with 11 gravid females.[9,19] Thick scales of shed skin allow extended survival and dispersion of enormous numbers of mites. Numerous institutional scabies epidemics have been traced to this highly contagious scabies in the index patient.[2,3,5,8,9]

Crusted scabies is associated with immune, cognitive, and cutaneous sensation deficiencies and inability to scratch.[1,18,20] It is often misdiagnosed as eczema or neurodermatitis,[1] resulting in the delay of proper diagnosis and treatment. Yellowish, thick, scaling crusts are often found in an acral distribution, and a generalized eruption may be present with or without pruritus. Nail and subungual thickening form an occult reservoir of mites that requires special attention.[18,21]

Diagnosis

A high index of suspicion for scabies should be maintained by physicians and staff of extended care facilities. The differential diagnosis for scabies includes eczema, neurodermatitis, urticaria, contact dermatitis, drug eruption, impetigo, and, when bullous lesions are present in the elderly, bullous pemphigoid.[22,23] To make a diagnosis, a thorough skin examination should be undertaken under good light using a hand-held magnifying lens.

Diagnostic tests are vital to establishing the presence of scabies and only take a few minutes. For the most reliable test, a skin scraping is examined under a microscope. First, a drop of mineral oil is placed on the skin over a burrow or suspected lesion. Then a rounded scalpel blade (#15 disposable) is held vertical to the skin, between thumb and forefinger, and drawn firmly across the oiled, stretched skin. The specimen is placed on a microscope slide, one drop of mineral oil is added, and a coverslip is placed over the slide. The specimen is then examined under low power for mites, eggs, and scybala[1] (Figure 2).

The burrow ink test involves painting suspected sites with ink from a fountain or felt pen, waiting a few minutes, then wiping the ink off with alcohol.[4,23] The ink will penetrate and highlight mite burrows (Figure 3). False negatives are reduced by testing multiple sites and

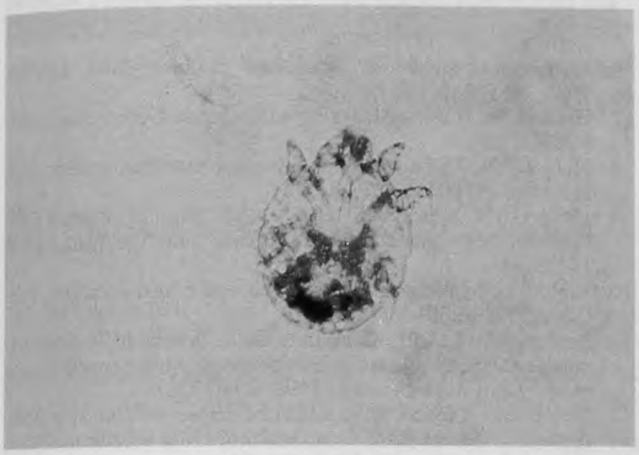

Figure 2. *Sarcoptes scabiei* mite as seen microscopically in scrape preparation.

then scraping positive burrow sites[23] for microscopic examination.

Treatment

Several scabicides are available. Older remedies such as 10% sulfur ointment and 25% aqueous benzyl benzoate are effective, but are now seldom used. The standard treatment for the last 30 years has been GBHC (Kwell, 1% lindane, Reed & Carnrick, Piscataway, NJ).[10] It is easy to apply, nonirritating, and more effective than older treatments including crotamiton 10% (Eurax, Westwood-Squibb, Princeton, NJ).[14,18] However, GBHC is absorbed through the skin, and may result in toxic serum levels in patients with thin or fissured skin, or with overuse, especially in elderly patients. It may cause seizures and should be avoided in infants, pregnant women, or patients with seizure disorders or crusted scabies. There have been reports of seemingly lindane-resistant scabies in several nursing homes,[10,11] yet it is difficult to exclude the possibility that these were simply reinfestations.

Figure 3. Scabies burrows highlighted with ink. This is a positive burrow ink test result.

Permethrin 5% cream (Elimite, Allergan Herbert, Irvine, Calif) is a newer agent for scabies treatment. It is a synthetic contact insecticide derived from chrysanthemum pyrethrins.[24] It is poorly absorbed through intact skin. Thus, it persists on the surface after topical application with low resulting systemic levels of pyrethrins. In a blinded clinical trial, 91% (64/70) of patients were cured with a single application of permethrin, but only 65% were cured (15/23) with GBHC.[10] Longstanding scabies in extended care facilities is especially difficult to treat. In a study relevant to nursing homes, under a comprehensive treatment and cleaning program, Yonkosky (1990)[11] reported a 47% cure rate with one permethrin application, 86% with two, and 98% with three. Adverse effects are mild, compared with those of GBHC, and are primarily itch and brief stinging while posttreatment pruritus is reduced.[25] Because of its efficacy and limited toxicity, permethrin 5% cream appears to be the drug of choice for scabies in most situations, and very appropriate when mass treatment is necessary.[26] It is applied to the patient from ears to soles (and scalp, if indicated). If fingernails and toenails are involved, they should be trimmed and cream applied underneath with a soft toothbrush.

One to four weeks after scabies treatment, patients should be reexamined and scrape preparations made. If scabies persists or there has been no improvement, treatment should be repeated regardless of the agent used. The itch commonly persists for weeks, despite adequate treatment.[1,7,10,14] Occasionally, a dermatitis that is caused by an allergy to mites persists for a couple of weeks after the mites have been destroyed. If prolonged, however, further evaluation is indicated. Hydroxyzine, 10 to 50 mg every 4 to 8 hours, 1% hydrocortisone cream,[14,24] and moisturizers and mild soaps (Dove, Basic) may help relieve postscabietic pruritus.

Management

Management of an outbreak of scabies in an extended care facility requires considerable organizational skill (Table 2). Labor-intensive treatment and cleaning must be arranged. Patients, staff, family, and visitors must be tactfully notified, educated, and treated. Nonaggressive management usually prolongs the scope and course of infestations, increasing the ultimate costs. As evidenced by our experience, the cost may be quite high. In another nursing home $4000 was spent on scabicides and medications alone over a 13-month period.[16]

Our case demonstrates many of the challenges en-

Table 2. Management of Scabies Epidemic in an Extended Care Facility

1. Maintain high index of suspicion. Keep staff knowledgeable and vigilant.
2. Be aware of atypical distribution and lesions.
3. Avoid empiric treatment.
4. Examine entire body of all suspected patients and contacts carefully in good light with a hand-held magnifying lens.
5. Perform diagnostic tests; ie, burrow ink tests, multiple scabies preparations, or biopsy if necessary.
6. Notify and educate patients, staff, family, and frequent visitors about scabies and the need for cooperation in treatment.
7. Select an effective scabicide. Permethrin 5% cream is the drug of choice.
8. Simultaneously apply scabicide to all patients, staff, contract staff, and frequent visitors, symptomatic or not. Also treat symptomatic family members of staff and visitors.
9. Launder all bedding and clothes worn in the last 48 hours in hot water (or dry clean) and do not use again for 3 days.
10. Clean beds and floors with routine cleaning agents just before scabicide is removed from patients.
11. Reexamine and treat again if necessary in 1 week.
12. Follow-up inspection in 4 weeks.

countered in identifying and treating scabies outbreaks in the nursing home setting. Inadequate contact precautions, atypical presentations in elderly residents, and delayed or inaccurate diagnosis lead to prolonged infestation. Following the diagnosis of scabies, the need for treatment of contacts and an appreciation of the nature and scope of the infestation are paramount. Increased awareness of this problem should avert or curtail future outbreaks.

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