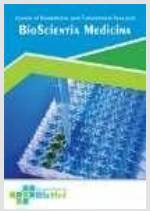
eISSN (Online): 2598-0580



Bioscientia Medicina: Journal of Biomedicine & Translational Research

Journal Homepage: www.bioscmed.com

Scabies in the Elderly: A Narrative Literature Review

Aurelia Stella Stephanie[1*], Aurelia Stephanie[2]

[1]Atma Jaya Hospital, Jakarta, Indonesia

[2]Sanglah General Hospital, Denpasar, Indonesia

ARTICLE INFO

Keywords:
Elderly
Pruritus
Mites
Sarcoptes scabiei
Scabies

***Corresponding author:**
Aurelia Stella Stephanie

E-mail address:
aureliastellaa88@gmail.com

All authors have reviewed and approved the final version of the manuscript.

https://doi.org/10.37275/bsm.v6i11.610

A B S T R A C T

Scabies is an ectoparasite infestation of the skin caused by the mite *Sarcoptes scabiei*. In diagnosing scabies in the elderly, the practitioner should consider the overall clinical picture, including history, physical examination, and diagnostic tools to assist in making clinical decisions. In this population, early diagnosis and treatment of scabies are essential to prevent secondary infection and sepsis. Treatments that can be given to scabies in the elderly include eradication of mites, treatment of symptoms and complications, and therapy in close contact to prevent transmission. This literature review aims to discuss the pathophysiology, diagnosis, and management of scabies in the elderly.

1. Introduction

Scabies is an ectoparasite infestation of the skin caused by the mite *Sarcoptes scabiei*. This can occur through direct skin contact, infected clothing, or bedding. Symptoms that usually occur are intense pruritic eruptions in areas such as between the fingers, wrists, axillae, areola, and genitalia. There are groups prone to scabies, such as children, the elderly and low-income people, and those who are immunocompromised. Scabies in the elderly and immunocompromised is difficult to diagnose because the lesions that appear are similar to those of other diseases. Factors that cause the elderly to be susceptible to scabies are reduced mobility, living in groups, and difficulties in implementing certain treatments. Therefore, in diagnosing elderly patients with scabies, there is a delay in diagnosing and incorrect or inadequate therapy that often causes an outbreak in areas that have high-risk factors for scabies infestation.[1]

Epidemiology

Scabies is a global disease and health burden. The greatest burden of scabies occurs in hot, tropical, densely populated areas and low-income communities.[2] Based on data from the World Health Organization (WHO) states that the incidence of

scabies globally is estimated to be around 200 million people and the prevalence ranges from 0.2%-71%.[2,3] In Indonesia scabies are also still a health problem. According to neglected tropical disease (NTD) data, the prevalence of scabies in Indonesia in 2017 was around 6% of the total population in Indonesia.[4,5]

Etiology and risk factors

The cause of scabies by the mite *Sarcoptes scabiei var. hominis*.[4] These mites can survive outside the human body for about 24 to 36 hours at normal room temperature and relative humidity of 40-80%.[5] This mite is transmitted by direct skin contact, and household contact is at high risk. The transmission takes about 20 minutes of direct contact (e.g., handshake or sexual contact). Scabies affects several species other than humans, namely dogs, pigs, and wild animals.[4]

The risk factors for scabies consist of age, gender, level of hygiene, shared use of goods, population density, level of knowledge about scabies, and socioeconomic status. Scabies occurs in children and the elderly. In the elderly, scabies that occurs is crustal scabies. Scabies is easy to infest in the elderly because of a decrease in immunity and changes in the physiology of the elderly skin. Changes in skin physiology in question are atrophy of the epidermis and dermis, hyperkeratosis, decreased barrier function, and a slower healing process. Scabies more easily attacks the elderly population who are cared for in nursing homes, people with HIV/AIDS, and people who are taking drugs or undergoing therapy, thereby lowering the body's immunity.[4.5] Scabies can affect both men and women but is most common in men. This is because men pay less attention to hygiene than women. In a study in East Jakarta in 2014, the prevalence of scabies in male students was 57.4% compared to 42.9% for women.[4.5]

Scabies causes intense itching, especially at night and during hot or humid weather. This causes scratching to relieve the itching. With scratching, eggs, larvae, and adult mites can be on the nails so they can spread quickly and easily. So, it is important to wash your hands and trim your nails. Bathing with soap twice a day is also important because when bathing, the mites that are in the superficial parts will be released from the skin and rinsed away. The habit of washing clothes, drying towels, and drying the mattress in the sun at least once a week, can prevent the transmission of scabies. Mites will die on exposure to temperatures about 50°C in 10 minutes.[4.5]

Figure 1. *Sarcoptes scabiei var. hominis*[6]

Pathophysiology of scabies

Adult female mites dig tunnels 1 to 10 millimeters long in the superficial layer of the epidermis and lay 2 to 3 eggs daily.[7,8] The mites will die 30 to 60 days later, and the mite eggs will hatch after about 2 to 3 weeks.[8,9] If infestation occurs, papules may appear within 2 to 5 weeks. These papules are tunnel-shaped or comma-shaped and range in length from a few millimeters to

1 centimeter. Usually, the infestation occurs under thin skin in areas such as the interdigital folds, areola, umbilical area, and penis.[7,10]

In patients with diabetes mellitus and the elderly, there is a decrease in T cell-mediated cellular immunity which plays a role in suppressing the proliferation of mites. In the elderly, there is a decrease in immunity and physiological changes in the skin of the elderly. Changes in skin physiology in question are atrophy of the epidermis and dermis, hyperkeratosis, decreased barrier function, and a slower healing process. Cognitive decline, lack of nutrition, and mobility make the elderly vulnerable to infection and require care from people around, thereby increasing the risk of transmission [1,5,10,11]

Clinical manifestations

Symptoms of scabies in the elderly include atypical symptoms in the elderly found in diffuse hyperpigmented plaques, especially in the palmoplantar region with thick crusts and the presence of brownish yellow scales containing millions of mites so that it is highly contagious. Some studies have also found that lesions can appear in the groin area and under clothing areas where this can be missed on physical examination. In contrast to classic scabies, skin lesions usually spread throughout the body, including the scalp, behind the ears, palms of the hands, soles of the feet, and nails. Abnormalities in the nail can be in the form of subungual hyperkeratosis or nail dystrophy.

Some patients may have crusted scabies.[1] Crusted scabies usually occurs in immunocompromised patients with diabetes mellitus, HIV, and the elderly.[7] Classical scabies is associated with a low quantity of about 10-15 mites, whereas crustacean scabies is associated with up to millions of mites in the body.[1] Crusted scabies clinically present as a hyperkeratotic dermatosis that usually affects the palms of the hands and soles of the feet, usually with fissures.[5] Hyperkeratotic lesions occur due to high concentrations of mites, which cause excessive keratin production in the stratum corneum.

Pruritus usually occurs at night and is intense as a result of a delayed-type hypersensitivity reaction to mites, mite feces, and mite eggs.[1,5] Symptoms begin to occur 3 – 6 weeks after the primary infestation or 1 – 3 days in those who have previously been infected.[1] This pruritus can reduce the number of mites, but this process can be impaired in the elderly with neuropathy, cognitive impairment, or limited mobility. In addition, cognitive impairment may impair the patient's ability to communicate symptoms of itching or discomfort, which may hinder diagnosis.[1]

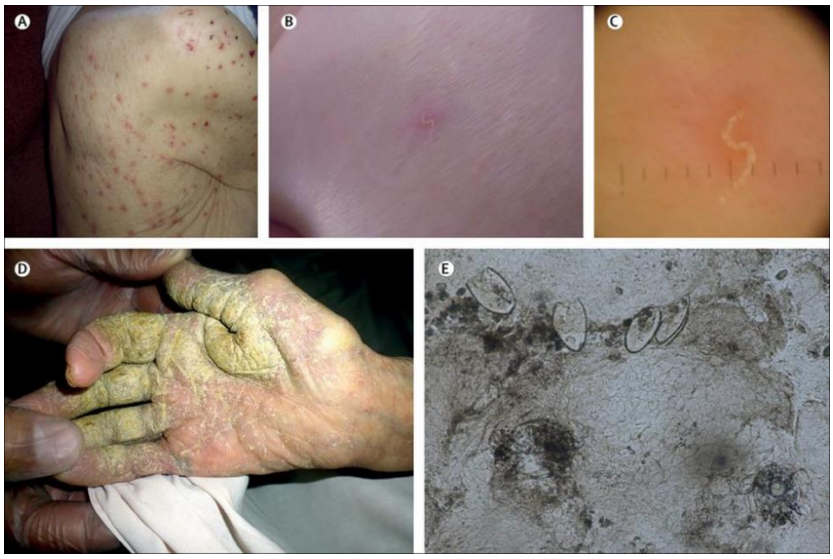


Figure 2. Signs of scabies: papules (A), tunnels (B), dermatoscopy tunnels (C), hyperkeratotic and crusted lesions (D), and *Sarcoptes scabiei* mites and eggs at 10x[8] magnification microscopic.

There is a clinical grading according to The International Alliance for Control of Scabies (IACS) for crustacean scabies that helps to assess the severity of the disease and guide therapy. The score obtained based on clinical assessment consists of 4 domains, namely the distribution and spread of the disease (body surface area), the severity/depth of crusted skin, the number of episodes of crusted scabies, and the level of cracked skin and pyoderma. Each domain is rated between 1 (mild) to 3 (severe). The results of the total assessment are grade 1 (score 4-6), grade 2 (score 7-9), and grade 3 (score 10-12).[9]

Table 1. The scale of severity of crustacean scabies.[9]

A: Distribution and extent of crusting	
1. Wrist, web spaces, feet only (< 10% total body surface area [TBSA]) 2. Above plus forearms, lower legs, buttocks, trunk, or 10-30% TBSA 3. Above plus scalp or >30% TBSA	
B: Crusting/Shedding	
1. Mild crusting (<5 mm depth of crust), minimal skin shedding 2. Moderate 5-10 mm crusting, moderate skin shedding 3. Severe >10 mm profuse skin shedding	
C. Past Episodes	
1. Never had it before 2. 1-3 prior hospitalizations for crusted scabies or depigmentation of elbows/knees 3. >4 hospitalizations for the above plus legs/back or skin thickening	
D. Skin Condition	
1. No cracking or pyoderma 2. Multiple pustules and/or weeping scores and/or skin cracking 3. Deep skin cracking with bleeding, widespread purulent exudate	
Grade 1: score 4-6 **Grade 2: score 7-9** **Grade 3: score 10-12**	3 doses of ivermectin 200 μg/kg – day 0, 1, 7 5 doses – day 0, 1, 7, 8, 14 7 doses – day 0, 1, 7, 8, 14, 21, 28
All patients also treated with benzyl benzoate with keratolytic cream	

This table was adapted from Davis JS et al.[32] under the term of Creative Common Attribution 4.0 license (CC-BY 4.0).

Table 2. The results of the scoring scale of the severity of crustacean scabies.[9]

A: Confirmed Scabies
A1: Mites, eggs, or faeces on light microscopy of skin samples A2: Mites, eggs, or faeces on individual using a high-powered imaging device A3: Mite visualized on individual using dermoscopy
B: Clinical Scabies
B1: Scabies burrows B2: typical lesion affecting male genitalia B3: Typical lesions in a typical distribution and two history features
C. Suspected scabies
C1: Typical lesions in a typical distribution and one history feature C2: Atypical lesions or atypical distribution and two history features
H. History Features
H1: Pruritus H2: Close contact with an individual who has had itch or typical lesion in a typical distribution

The table was reproduced from Engelman D et al. which is licensed under Creative Commons Attribution—NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0).

A secondary bacterial infection usually occurs after tunnel formation by mites. Impetigo is a synergistic condition between scabies mites and *Streptococcus pyogenes*. Mites release complement inhibitory proteins that work to prevent opsonization of *S. pyogenes*, causing bacteria to proliferate and evade the immune system.[7]

Diagnosis of scabies

Diagnosis of scabies can be made by history taking, physical examination, and tools to assist in diagnosis. Physical examination revealed large, thick, yellow to brown crusted lesions and creamy-gray skin scales. Lesions are usually found on the hands, feet, neck, scalp, face, chest, and legs.[1,10]

Dermoscopy supporting examinations can visualize scabies mites. The result will be a picture of a delta-wing jet where there is a triangular mark or V-shaped structure indicating the head of the mite and the presence of a triangular winged jet sign with smoke that symbolizes the mite's head with a tunnel behind it.[7] The gold standard examination is to examine the skin scrapings where *S. scabiei*, eggs, or schibala are found on skin scraping examination.[10,12] Differential diagnoses in crustaceous scabies are psoriasis, seborrheic dermatitis, atopic dermatitis, hyperkeratotic eczema, dyshidrotic eczema, keratoderma palmoplantar, erythrodermic mycoses fungoides, and Sézary syndrome.[10]

Management of scabies in the elderly

The management of scabies in the elderly includes eradication of mites, treatment of symptoms and complications, and treatment of close contacts to prevent transmission.[1,14,15] Based on the CDC recommendations, the first line of treatment for crusted scabies is 5% permethrin cream. The use of this cream is used every day for 7 days and then 2 times a week until the symptoms disappear. A single dose of 200 g/kg ivermectin should be given orally together on days 1, 2, 8, 9, and 15 and potentially on days 22 and 29 for severe cases.

When the patient cannot tolerate permethrin, the use of other second-line topical agents such as benzoyl benzoate, sulfur, crotamiton, and malathion can be substituted. The US Centers for disease control and prevention recommends topical 5% benzyl benzoate cream as an alternative to permethrin for patients with crusted scabies. Crust scabies was considered cured if, during monitoring 1-2 weeks after the end of treatment, there were no manifestations of active scabies, namely no active lesions, no nocturnal pruritus, and the discovery of mites, eggs, and scabies on skin scraping examination.[16]

Although many topical therapies are available for the treatment of both classic and crusty scabies, elderly patients may have difficulty applying topical therapy because of limited mobility. Whenever possible, the patient should receive appropriate assistance to apply the medication. In cases where elderly patients have significant difficulties, oral ivermectin may be used as an option.[9]

Management of complications of scabies in the elderly

In addition to the management of mite eradication, symptoms and complications of scabies, including pruritus, secondary infection, and cutaneous nodules, should also be treated. Pruritus persisting for up to 4 weeks after maximal treatment is often treated with antihistamines. However, first-generation H1 antihistamines should be used with caution in adults 65 years of age and older because they are associated with central nervous system side effects such as drowsiness, fatigue, dizziness, impaired thinking and memory, agitation, and hallucinations. Thus, the use of second-generation antihistamines or low-dose gabapentin for pruritus is recommended in the elderly population. When there is clinical suspicion of secondary infection, then appropriate systemic antibiotics should be used.[9]

Cutaneous nodules persist after mite eradication. They can be treated with the application of a superpotent topical steroid up to twice daily for 2-3 weeks or intralesional injection of a corticosteroid such as triamcinolone acetonide (5-10 mg/mL). Other

data suggest that topical calcineurin inhibitors such as 0.03% tacrolimus ointment or cryotherapy may have some efficacy in nodule repair.

The existence of prophylactic therapy that can be given using a single dose of ivermectin 200 grams/kg given orally is an effective method for the prevention and control of scabies in a large population.[9] In classic scabies, direct skin-to-skin contact should be avoided until at least 8 hours after treatment. Individuals with prolonged skin-to-skin contact with affected patients should be treated. The affected patient's clothing and bedding should be machine washed and tumble-dried using hot water. Cleaning and vacuuming of the patient's room should be carried out after the room has been emptied.[9]

In crusted scabies, the affected patient should be isolated from other patients and also require a dedicated patient care team to minimize staff exposure. Strict contact precautions, including avoiding direct skin contact with the patient and use of personal protective equipment, including gowns, gloves, and shoe covers, should be used until the results of the scabies preparation are negative. Frequent cleaning of the patient's room to remove contaminated scale and scale. Washing of clothing and bedding should be carried out as previously described, and elderly caregivers should use protective clothing and gloves. All individuals who come into contact with the patient or their clothing should be treated and bedding or furniture treated. [9]

2. Conclusion

Scabies in the elderly is a challenge in the world because of its atypical symptoms and the presence of several complications in its treatment. Elderly patients are more susceptible to crusted scabies, considering that most patients in this group have a decreased immune response, nutritional deficiencies, and changes in skin physiological function. In this population, early diagnosis and treatment of scabies are essential to prevent secondary infection and sepsis. Treatments that can be given to scabies in the elderly include eradication of mites, treatment of symptoms and complications, and therapy in close contact to prevent transmission.

3. References

1. Raffi J, Suresh R, Butler DC. Review of scabies in the elderly. Dermatol Ther. 2019; 9(4):623–30.
2. Zhang W, Zhang Y, Luo L, Huang W, Shen X, et al. Trends in prevalence and incidence of scabies from 1990 to 2017: findings from the global burden of disease study 2017. Emerg Microbes Infect. 2020; 9(1):813–6.
3. World Health Organization. Scabies. 2020. Available from: https://www.who.int/news-room/fact-sheets/detail/scabies
4. Richards RN. Scabies: Diagnostic and therapeutic update. J Cutan Med Surg. 2021: 25(1):95–101.
5. Trasia RF. Scabies in Indonesia: Epidemiology and prevention. Insights Public Health J. 2020; 1(2):30–8.
6. Hardy M, Engelman D, Steer A. Scabies: a clinical update. Australian Family Physician. 2017; 46(5).
7. Chandler DJ, Fuller LC. A review of scabies: An infestation more than skin deep. Dermatology. 2019; 235(2):79–90.
8. Bartosik K, Tytuła A, Zając Z, Buczek W, Jasztal-Kniażuk A, et al. Scabies and pediculosis in penitentiary institutions in Poland-A study of ectoparasites in confinement conditions. Int J Environ Res Public Health. 2020; 17.
9. Gilson RL, Crane JS. Scabies. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022.
10. Niode NJ, Adji A, Gazpers S, Kandou RT, Pandaleke H, et al. Crusted scabies, a neglected tropical disease: case series and literature review. Infect Dis Rep. 2022; (3):479–91.
11. Verma R, Arora VK, Kalra S, Kumar A, Srivastava A, et al. Rare form of crusted

scabies in diabetes: a case report. Indian Journal of Clinical Practice. 2022; 32(9).34-7.
12. Cassel JA, Middleton J, Nalabanda A, Lanza S, Head MG, et al. Scabies outbreaks in ten care homes for elderly people: a prospective study of clinical features, epidemiology, and treatment outcomes - The Lancet Infectious Diseases. 2018; 18(8): 894-902.
13. Welch E, Romani L, Whitfeld MJ. Recent advances in understanding and treating scabies. Fac Rev. 2021; 10:28.
14. Indonesian Association of Dermatologists and Venereologists (PERDOSKI). Clinical practice guide. Jakarta: PERDOSKI. 2021.
15. Salavastru CM, Chosidow O, Boffa MJ, Janier M, Tiplica GS. European guidelines for the management of scabies. J Eur Acad Dermatol Venereol JEADV. 2017; 31(8):1248–53.
16. Ferreira AA, Esteves A, Mahia Y, Rosmaninho A, Silva A. An itchy problem: a clinical case of crusted scabies. EJCRIM. 2017; 4(5).