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Review Article

Scabies: Clinical manifestations and diagnosis



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ABSTRACT

Introduction: Scabies is an infectious disease caused by an obligate parasite of human skin – *Sarcoptes scabiei* var. *hominis*. The disease affects people regardless of their age, sex or socioeconomic status. The transmission occurs mainly through direct contact with an infected person as well as personal items including clothes, bedclothes, etc.

Aim: The aim of the paper is to present a variety of clinical manifestations of scabies as well as diagnostic methods used.

Discussion: The diagnosis of scabies can often times be difficult, especially if there are concurrent diseases, with pruritus being a symptom. The skin lesions may vary in appearance, depending on the local and general immune response. The diagnosis rests on finding characteristic signs of the disease accompanied by the pruritus becoming particularly intense at night. The use of various diagnostic tools allows for confirmation of the diagnosis, with varied sensitivity and specificity, which is based on confirmation of the presence of the parasite.

Conclusions: Scabies still remains a major public health problem worldwide. Research is hindered mainly due to difficulty in obtaining the material from infested people as well as a lack of an in vitro system. To date, there is no diagnostic method for detecting scabies infection, which would give a 100% reliable result. Each of the methods mentioned above has some limitations in use. It seems that the sensitivity of those methods will vary, depending on a patient's clinical features.

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1. Introduction

Scabies is a common infectious skin disease caused by the human scabies mite of *Sarcoptes scabiei* var. *hominis*, which has been known since ancient times. Aristotle was the first to use

the term 'akari' with relation to this parasite. Although scabies has been widely described, it was Bonomo and Cestoni who associated the symptoms with the parasite in 1687. They described, among other observations, the parasitic nature and course of the disease, treatment, possible routes of transmission, as well as the morphological features of the parasite.^{1,2}

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The disease affects people of all races and social classes. The cases of infestation among people in places where long-term care is required such as residential homes or hospitals, as well as schools, nurseries and other institutions are not infrequent either.^{3,4}

Scabies is recognized as a public health problem worldwide. The majority of the cases reported occur in the Third World and developing countries, which are at the same time endemic regions.⁵

2. Aim

The aim of the paper is to present a variety of clinical manifestations of scabies as well as diagnostic methods used.

3. Discussion

3.1. Clinical manifestations

In people, clinical manifestations of scabies can mimic a number of other skin diseases, such as eczema, impetigo, fungal infections, allergic reactions and contact dermatitis, which poses diagnostic difficulties.⁶ The scabies incubation period lasts approximately 4–6 weeks, and may possibly be shorter if the initial infestation is heavy. Thus the affected people become a source of infection prior to the institution of treatment. Consequently, all family members and other people sharing the same living quarters should also be treated.⁷ However, in the case of reinfection the reaction is noticed quickly, with characteristic skin lesions and itching appearing within 24–48 h. Depending on how advanced the infection is and the type of inflammatory response, the clinical manifestations may vary.⁸ In the past people presenting numerous skin lesions were thought to be heavily infested with a high parasite load. This, however, has not been confirmed. The studies carried out by Johnson and Mellanby⁸ show that extensive clinical signs may occur even at a small parasite load, while it is possible for people presenting hardly any symptoms to carry a huge parasite burden. If scabies is left untreated, secondary infection often develops. Pyoderma is a result of a secondary infection caused by *A streptococci* and *Staphylococcus aureus*.⁹

3.1.1. Classical or typical scabies

One of the main presenting symptoms is pruritus, becoming more intense at night. Skin lesions with a diagnostic value show as typical comma-like or irregular tunnels measuring from a few millimeters up to a few centimeters on rare occasions. The tunnels are burrowed by a female scabies mite which positions itself at the end of the burrow.¹⁰ A study by Johnson and Mellanby⁸ involving 886 men with 9 978 mites recovered showed that 63.1% of lesions were found on the skin of the wrists and arms, excluding hands, 10.9% on the elbows, 9.2% on the feet and ankles, 8.4% in the genital area and 4.0% on the buttocks. Further studies involving 119 women and 1 494 mites showed the lesions to be located mostly on the arms and wrists, accounting for 74.3%; 7.5% were found on the

hands, 5.9% on the elbows, 8.8% on the feet and ankles and 1.1% on the buttocks.¹¹

3.1.2. Scabies in young children and older people

In infants and younger children typical lesions including vesicles, pustules and nodules are usually distributed unevenly, with lesions located on hands, feet and natural body creases. Unlike in older children and adults, the head, hands and the soles of the feet may also be affected in infants.¹² In the elderly scabies is often misdiagnosed because the itching may be wrongly attributed to the entity known as senile pruritus, which may hinder the diagnostic process.¹³

3.1.3. Nodular scabies

Skin lesions present as round, smooth nodules of 5–8 mm in diameter, with red (or reddish) and brownish coloration. They are found on the areas of very thin skin, such as the genitals or inguinal folds, but the lesions never affect the hands or feet.¹⁴ According to the results of the previous studies, there were no mites identified in the nodules and they are thought to appear as a result of delayed hypersensitivity reaction to the mites and not of an active infection.¹⁵ This stands in opposition to the studies conducted by Czeschik et al.¹⁶ and Liu et al.¹⁷ in which mites were found on the section of the nodules.

3.1.4. Vesicular scabies or bullous scabies

This is a rather uncommon variety of scabies usually occurring in elderly people. It may mimic bullous pemphigoid clinically as well as histologically, and may resemble the latter even with immunofluorescence findings. The diagnosis is particularly difficult when epidermal scrapings fail to show the parasite or its feces.¹⁸ It seems likely that the formation of the bullae in these conditions is associated with the prolonged presence of the parasite in the host's epidermis. This may produce a specific immunological response which activates T-helper 2 cells, thus raising the level of interleukin 5 and, in turn, that of eosinophiles with the release of the proteolytic enzymes near the basement lamina, which finally leads to blister formation.^{19,20} There has been some debate as to whether these blisters are characteristic of true scabies or are rather due to bullous pemphigoid triggered by the parasite.²¹

3.1.5. Norwegian scabies (*crusted scabies* or *scabies crustosa*)

In the majority of cases, Norwegian scabies is diagnosed in immunocompromised people. These include patients treated topically or systemically with corticosteroids, HIV-positive people with human T-lymphotropic virus 1 (HTLV-1) infection, systemic lupus erythematosus, rheumatoid arthritis, as well as mentally or physically disabled people.^{22,23} Scabies may also affect people whose immunological system is weakened.²⁴ The incidence rate for Norwegian scabies in the Australian Aboriginal community remains one of the highest rates worldwide.²⁵ It is estimated that even 50% of children in this community may be infected.²⁶ In Norwegian scabies, proliferative and hyperkeratotic response is manifested by the formation and accumulation of thick scales. It is probably due to an increased interleukin-4 level.²⁷ One gram of crusted skin may contain as many as 4 700 mites.²⁴

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