



(CASE REPORT)



## Norwegian scabies in HIV and tuberculosis infected patient: A case report

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### Abstract

Norwegian scabies is a rare scabies with the manifestation of thick crusts of the extremities of the skin that contain eggs and mites. Several conditions in which scabies infection is easily transmitted include immunocompromised, home nursing, and severe neurological disorder. The aim of this case report was to present a thorough analysis of a comprehensive resource for the management of Norwegian scabies patients, with a specific focus on individuals who also have HIV or other immunocompromising diseases. A 56 – year – old female presented with dermatitis lesions and itching with sever hyperkeratosis, several maculae and papules on neck and armpits for four months duration. *Sarcoptes scabiei* was found from microscopy examination of skin scraping. The patient received antiretroviral drugs, antituberculosis medication and scabicial treatment.

**Keywords:** Norwegian scabies; *Sarcoptes scabiei*; HIV; Tuberculosis; Crusted skin; Ivermectin

### 1. Introduction

Scabies is a highly contagious dermatological condition resulting from the infestation and sensitization of *Sarcoptes scabiei* var. *hominis* [1]. Scabies is estimated to have a global impact on roughly 150–200 million individuals, with an annual prevalence of approximately 455 million cases [2]. Scabies infestation has the potential to occur in all geographical regions. However, there is a larger prevalence of these occurrences in countries with lower income levels, tropical climates, and among younger demographic groups [2].

Norwegian scabies, also known as crusted scabies, is a variant of scabies that predominantly manifests in individuals who have been diagnosed with human immunodeficiency virus (HIV) infection, human T-lymphotropic virus (HTLV)-1 or have had immunosuppression following chemotherapy or organ transplantation [3,4]. This rare medical condition was identified in 1848 when Böck and Danielssen on a group of leprosy patients in Norway [3]. These individuals presented hyperkeratotic skin manifestations alongside a substantial infestation of many mites [3-5].

The potential for secondary infections, sepsis, and fatal consequences arises from the presence of skin lesions in scabies [6-7]. Therefore, timely diagnosis is imperative to facilitate the administration of appropriate treatment [8]. The aim of this case report was to provide a comprehensive resource for the management of Norwegian scabies patients, with a specific focus on individuals who also have HIV and pulmonology tuberculosis (TB).

### 2. Case

A 56 – years – old female, referred to-hospital for a confirmed diagnosis of HIV infection and pulmonary tuberculosis (TB), also presented thickened and scaled skin persisting for over four months. It initially started as red bumps on the lower extremities with intense pruritus. A progressive thickening and expansion of the scales, starting from lower legs

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and extending to interdigital spaces, palms, and elbows, began to appear and eventually covered progressively the entire body (figure 1).

Dermatologic examination revealed generalized, diffuse, hyperkeratotic lesions with excoriation and erosion marks that covered the entire body (Figure 1).

Laboratory examination found 9.6g/dL of haemoglobin, thrombocyte count of 123,000/mm<sup>3</sup>, leukocyte count of 7000/mm<sup>3</sup>, and CD4 T-lymphocytes count of 6 cells/mm<sup>3</sup>.

Skin scraping microscopic examination with 10% potassium hydroxide (KOH) revealed the presence of numerous adults of *S. scabiei* mites (Figure 2), with their eggs and dejections.

The treatment regiments involved four doses of oral ivermectin (18 mg) , topical permethrin solution, and antihistamines to alleviate the pruritus.

The permethrin cream was uniformly applicated on the entire body during nighttime, followed by two hours of leaving the cream on the skin before rinsing. Since the mites persisted in the patient's skin scrapings following the fourth day of permethrin application permethrin was continued for seven days. Following the scabicial treatment, during the first days, reduction in crusting was noticed. However, substantial crusting persisted on the soles of the feet and hands. The patient's family received scabicial treatment at the same time as the patient.



**Figure 1** Clinical condition of patient on hospital admission showing thick crusts on whole body



**Figure 2** Microscopic examination of crusts dissolved in 10% KOH revealed fields teeming with mites and eggs

Antibiotic therapy (amoxicillin + clavulanate and clindamycin) was also added on day 4, due to secondary bacterial infection.

The patient's progress under treatment on the eighth day was positive, showing decreased itchiness, thinning of pre-existing lesions, and absence of new lesions.

### 3. Discussion

Norwegian scabies is a highly contagious condition characterized by extensive mite infestation. Classic scabies requires fewer than fifteen *S. scabiei* mites and requires 15 to 20 minutes of close contact for transmission, whereas Norwegian scabies typically infects immunocompromised and weakened individuals with tens of thousands to millions of mites [1].

Due to the substantial infestation of mites, Norwegian scabies exhibits a high degree of contagiousness, consequently leading to a markedly elevated risk of transmission to individuals nearby [4,9,10]. In individuals affected by scabies, there is an activation of the cell-mediated immune response, resulting in the presence of various inflammatory cells (such as eosinophils, lymphocytes, and histiocytes) surrounding the burrows created by the mites, as observed through histological analysis. The pruritus seen in scabies is a result of a type IV hypersensitivity reaction to the compounds produced by the mites. The degree of contagion of scabies is directly proportional to the extent of crust formation observed by those affected by the condition [1,14].

The individual involved in the present case is a immunocompromised patient diagnosed with HIV and pulmonology tuberculosis, a known predisposing factor for Norwegian scabies or crusted scabies. The presence of pruritus throughout the body, particularly during nighttime, increases suspicion of scabies. However, it is worth noting that pruritus is not commonly observed in cases with crusted scabies.

Skin injuries due to frequent scratching often lead to complications in scabies infestation, such as impetigo caused by *Streptococcus pyogenes* or *Staphylococcus aureus*. The reciprocal interaction between the mite and host immune systems, which involves the synthesis of complement inhibitory proteins by the mite, facilitates *Streptococcus pyogenes*' survival and *Staphylococcus aureus*' growth [11]. Local complications might manifest as abscesses, cellulitis, and, in rare cases, necrotizing soft tissue infections [12]. The primary etiology of systemic problems associated with scabies primarily stems from secondary bacterial infections. Additionally, secondary bacterial infections have the potential to induce bacteremia and sepsis. The absence of medical intervention for crusted scabies poses a significant mortality risk due to the potential development of secondary sepsis [13,14]. In this case, antibiotic therapy was administered, specifically amoxicillin + clavulanate and clindamycin (at day 4), due to the discovery of a secondary bacterial infection.

Treatment involves eradicating the infestation with a topical ointment consisting of permethrin, crotamiton, lindane, benzyl benzoate, and sulfur, applied directly to the skin. However, topical treatments often cannot penetrate the crusted and thickened skin, leading to treatment failure. A dose of oral ivermectin 200 µg/kg on days 1, 2, and 8 is a safe, effective, first-line treatment for Norwegian scabies, rapidly reducing scabies symptoms [15]. Adverse effects of oral ivermectin are rare and usually minor

Appropriate scabies treatment aimed at peeling crusted skin, relieving itching, and increasing the patient ability to use the extremities. Comorbidity conditions caused by HIV and pulmonary tuberculosis should also be treated to optimize the outcome. Holistic therapy aiming to cure underlying infection, infestation and underlying nutrition and psychosocial problems must be addressed to fully cure this high-burden case.

Family members should also be screened for crusted scabies, and treated accordingly. Regardless of examination findings, all family members should be treated with a topical scabicide, and should repeat treatment in one week.

Mites can survive for up to 72 hours away from a human host. Living areas should be thoroughly cleaned, as crusted plaques will commonly be shed. Linen and mattresses should also be cleaned. Washing with water (with or without laundry detergent) removes most of the mites. Temperature of the water has no effect on the number of mites killed. If items cannot be washed, they should be kept sealed in plastic bags for a least 4 days. Sunlight is also effective in killing mites.

The patient was placed in isolation room with strict hygiene measures adapted to her condition, to prevent the transmission of the disease. The room exclusively accommodates patients, with a daily routine of changing bed sheets and pillows and soaking in hot water

Treatment will cure crusted scabies. However, patients with crusted scabies are at risk of reinfestation due to their immune status and living conditions. Education and regular follow-up are essential.

Mortality is significantly higher in older patients with crusted scabies in comparison with patients that have regular scabies. Disease-related mortality is attributed to sepsis.

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#### 4. Conclusion

This case study has been documented in a female patient with HIV and TB infection presented with Norwegian scabies, exhibiting widespread crusting across the body. The patient demonstrated improvement following a treatment regimen consisting of oral ivermectin therapy, permethrin in addition to providing hygiene education to the patient's family. This case highlights that to cure this high-burden case; holistic therapy for several factors, such as underlying infection, infestation of *S. scabiei*, should be done comprehensively and completely.

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#### Compliance with ethical standards

##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

##### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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