

Successful combination therapy of permethrin 5% cream and oral ivermectin in crusted scabies patient

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Abstract

Introduction: Crusted scabies, a severe form of *Sarcoptes scabiei* infestation, is characterized by generalized crusting and scaling, accompanied with hyperkeratotic nails. This case report aims to describe a successful treatment using a combination of permethrin 5% cream and oral ivermectin in crusted scabies patient.

Case: A 55-year-old woman presented with thick scales on her scalp and thickened fingernails and toenails for 3 months. At the onset, she had experienced itching, followed by the emergence of red rashes across her body for a period of 1 year. She was also diagnosed with rheumatoid arthritis and secondary adrenal insufficiency. Upon examination, her dermatological status revealed diffused erythematous papules and patches, partially covered with crusts and excoriations. Additionally, thick white scales and crusts were seen on her scalp and subungual hyperkeratosis was observed in both of her fingernails and toenails. Scraping examination revealed the presence of a large numbers of mites, eggs, and scybala. She was treated with permethrin 5% cream for 7 consecutive days and oral ivermectin 200 mcg/kgBW for a total of 5 doses (administered on days 1,2,8,9, and 15). On day 15, follow-up examination showed improvement in the skin lesions, and the scraping examination yielded negative results.

Discussion: Crusted scabies is a rare variant of scabies. The use of permethrin 5% cream, which is the most commonly used topical agent, in combination with ivermectin, an anthelmintic agent with antiparasitic properties, is recommended in numerous literature sources for the management of crusted scabies.

Conclusion: The combination therapy of permethrin and ivermectin, despite yielding excellent results in crusted scabies patients, is rarely utilized and reported in Indonesia. Therefore, this case report is expected to provide valuable insights into the management of crusted scabies in Indonesia and encourage further research in this area.

Keywords: Crusted Scabies; Permethrin; Ivermectin; Combination Therapy

1. Introduction

Scabies is a skin disease caused by infestation and sensitization of the mite *Sarcoptes scabiei* var. *hominists* and their products. There is a variant of scabies called crusted scabies, characterized by skin disorders in the form of crusts on the hands and feet, dystrophic nails, and generalized scaling [1]. Data from the Ministry of Health of the Republic of Indonesia in 2016 stated that the prevalence of scabies in Indonesia is 4.60% -12.95% and ranks third of the 12 most common skin diseases [2]. Based on annual reports of the Saiful Anwar General Hospital, Malang, Indonesia, there were 6 crusted scabies patients who went to the outpatient clinic and 9 who were hospitalized during the period 2017-2022.

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Concomitant oral and topical treatments provide the advantage of achieving early cure and avoiding repeated dosing. Combination treatment regimens include topical agents such as permethrin 5% cream with oral ivermectin. Several case reports indicate that ivermectin has been used successfully as a treatment for crusted scabies either as monotherapy or in combination with other topical scabicides [3]. Ivermectin in 12 mg caplets is currently available and registered by the Food and Drug Supervisory Agency in Indonesia. However, its use with topical agents for the treatment of crusted scabies in Indonesia has not been reported. This case report aims to describe the successful combination therapy of permethrin 5% cream and oral ivermectin in crusted scabies patients.

2. Case Description

A 55 years old woman with complaints of red rashes all over the body accompanied with itching (VAS 5/10-6/10) for 1 year. Initially, the itching was felt intermittently, which only worsened at night, then it was felt continuously for the last 3 months. The skin started to peel off and thick grayish-white scales appeared on her scalp and hair shafts. Her fingernails and toenails also have become thicker since the last 1 month. History of treatment with Dexamethasone 3 x 1 tablet for 1 year and was still routinely consumed in the last 3 months along with Ketoconazole cream 2 times a day. The patient was hospitalized because of general weakness, joint pain and stiffness, swollen extremities, and difficulty speaking for 6 months which has been getting worse since the last 2 weeks. The patient lives with her husband and daughter. Her husband also complained of itching all over the body which worsened at night accompanied by the appearance of red bumps for 6 months, but has never been treated. The patient's daughter did not have any similar complaints. Dermatological status of the facial, anterior-posterior trunk, superior-inferior extremities, abdomen, gluteal and genitalia showed multiple erythematous macules, papules, and patches, partially covered with grayish-white scales and accompanied with excoriation and desquamation. The scalp region showed multiple erythematous patches, partially covered with thick white scales. Digital 1, 2, 4 of the right manus, digital 1, 2, 4, 5 of the left manus, and digital 1, 2, 3, 4, 5 of both pedis showed subungual hyperkeratotic. Ectoparasite scraping examination on the skin and nails revealed large numbers of mites, eggs and scybala. The KOH 20% examination from fingernails and toenails showed hyphae and spores. Positive findings from the laboratory test are rheumatoid factor with a value of 128 IU/mL.

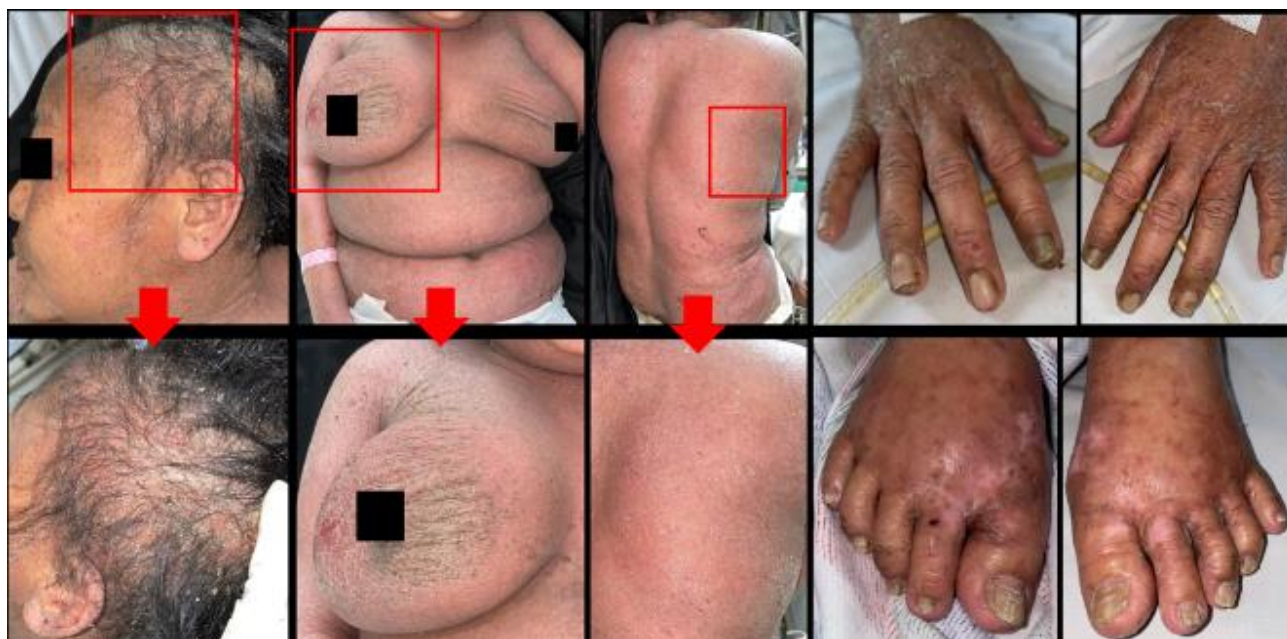


Figure 1 Dermatological status of the patient during the first examination

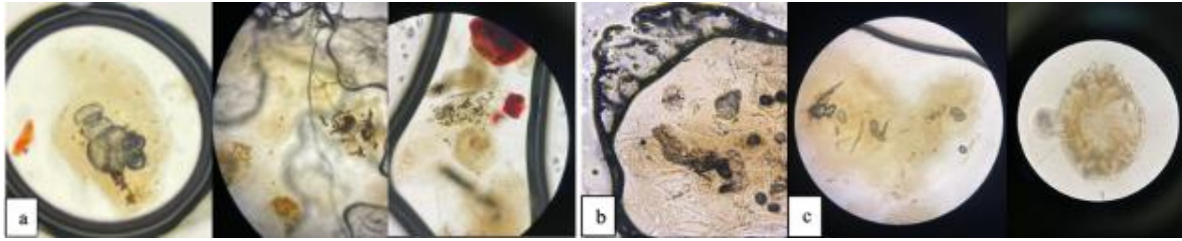


Figure 2 Ectoparasites scraping examination under microscope with 100x magnification

(a) 2 mites/field of view, 5 eggs/field of view, and scybala >20/field of view (skin scraping samples); (b) 1 mite/field of view (scalp scraping samples); (c) 1 mite/field of view and 8 eggs/field of view (nail scraping samples)

The patient was diagnosed with crusted scabies, onychomycosis, rheumatoid arthritis with the European League Against Rheumatism (EULAR) criterion score of 6, and secondary adrenal insufficiency during her current hospitalization period. Permethrin 5% cream was applied for 7 consecutive days (at night) and oral medication for the crusted scabies included Ivermectin 17 mg (equivalent to 200mcg/kgBW) which was given 5 times on day 1, 2, 8, 9 and 15 as well as Cetirizine 2 x 10 mg. Prior to administration of ivermectin, patient was screened for liver and kidney function with normal results. The onychomycosis management was postponed until the crusted scabies is resolved. During the treatment period, ectoparasites scraping was carried out every day whereas the mites, eggs and scybala became harder to find. Follow up on the 15th day revealed that the complaint of itching was decreased (from VAS 6/10 to 3/10), thick scales on the scalp region and erythematous papules all over the body have mostly disappeared. Scrapping examination no longer showed the presence of either mites or their products.



Figure 3 Dermatological status of the patient after 15 days of treatment

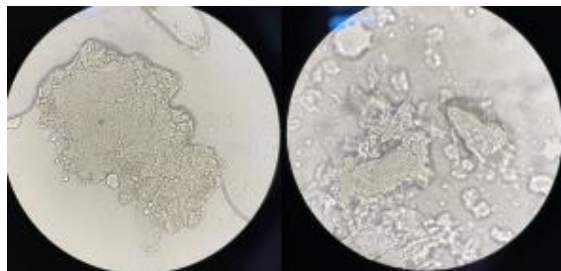


Figure 4 Negative findings in the ectoparasites scraping examination after 15 days of treatment

3. Discussion

Crusted scabies is a condition in which the number of infested mites reaches thousands to millions, so it has the potential to transmit the disease and is often become a source of transmission for scabies outbreaks [4]. The crusted scabies condition is a severe form of scabies. Crusted scabies generally occurs in individuals who are immunosuppressed, although it can also occur in immunocompetent individuals. Several conditions that can predispose include Human Immunodeficiency Virus (HIV) infection, leukemia, malnutrition, neurological disorders, corticosteroid use, diabetes mellitus, and autoimmune diseases [5]. In the contrary, the anamnesis showed that the patient had experienced crusted scabies before being diagnosed with rheumatoid arthritis. A study by Ren [6] stated that scabies patients have a 46% higher risk of experiencing rheumatoid arthritis. Although there is no theory that can explain the relationship between these two diseases, this might be due to the chronic inflammatory condition caused by scabies can be an important mediator of rheumatoid arthritis.

Crusted scabies patients often experience only minimal pruritus or no itching at all. In the reported case, the patient still felt itchy with VAS 5-6/10. This condition shows that the patient still has proper immunological response towards the mite infestation. However, the patient could not scratch because of her joint pain and stiffness, meanwhile, scratching is one of the defense mechanisms to reduce mite load in the body.

The patient's dermatological status showed thick scaling on the scalp, erythematous papules and patches that spread diffusely which were partially covered with brownish crusts and desquamation. Subungual hyperkeratotic was also found on digital manus and pedis. This condition is relevant with the typical lesion of crusted scabies which is hyperkeratotic plaques that spread diffusely over the palmar and plantar regions with thickening and dystrophy of the toenails and fingers. The form of huge infestation can also look like scaly and crusted lesions on the face and scalps which are full of mites inside. Definitive diagnosis through microscopic identification by finding *Sarcoptes scabiei* mites or their materials (eggs and feces/scybala) [3]. Ectoparasites scraping examinations in the reported case which were taken from skin, scalp and nails showed the presence of mites, eggs and feces in large number. Thus, based on the anamnesis, physical and supporting examinations, the patient was eventually diagnosed with crusted scabies. The Royal Darwin Hospital Infectious Diseases Department Protocol [7] classifies the severity of crusted scabies into 3 levels which are assessed from the distribution and extension of the crust, thickness of the crust, past episodes of crusted scabies, and skin condition. According to those aspects, the patient was classified into the 2nd degree (moderate).

The main principles of crusted scabies therapy are removing the hyperkeratotic layer with keratolytic agents and administering topical and systemic scabicide agents. Permethrin 5% cream is a topical scabicide that acts on the arthropod cell membrane by changing the sodium transport function to polarize the mite motor nerve neuromembrane, causing paralysis. In crusted scabies cases, permethrin 5% cream is used for 7 consecutive days, followed twice weekly until the crusted scabies is resolved.

The systemic agent recommended in combination therapy is ivermectin, an anthelmintic agent that has been used in veterinary medicine since 1981 and has excellent antiparasitic properties. Ivermectin acts on nerve synapses by utilizing glutamate or aminobutyric acid [8]. Administration of ivermectin orally to crusted scabies at a dose of 200mcg/kgBW can be adjusted according to the degree of severity (3 days in mild case, 5 days in moderate case, and 7 days in severe case). Patients were given permethrin 5% cream for 7 consecutive days and 200 mcg/kgBW oral ivermectin for 5 times, according to the degree of severity. In a condition where ivermectin is unavailable, Gunawan [9] reported that oral albendazole could be used as an alternative.

Ectoparasites scraping, complete blood count, liver function test, kidney function test, and pregnancy test should be done before administering ivermectin. Side effects of this drug include increased creatinine levels, exacerbation of eczema, diarrhea, vomiting and hypersensitivity reactions. At the end of follow-up, skin lesions were improved and no mites and its material were found. The patient did not experience any sign of side effects, so that the use of ivermectin in this case has shown good efficacy and safety.

4. Conclusion

Crusted scabies can be triggered by an immunocompromised condition, often resulting from prolonged steroid consumption. This case study from Indonesia demonstrated the successful treatment of crusted scabies using a combination therapy of permethrin 5% cream and oral ivermectin. It is worth noting that despite the remarkable outcomes observed in crusted scabies patients, the utilization and reporting of this particular combination therapy in

Indonesia remain uncommon. Therefore, we hope that this case report will offer valuable insights into the management of crusted scabies in Indonesia, potentially inspiring further research in this field.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to disclosed.

Statement of informed consent

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

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