

# A Cluster of In-patient Scabies in 5 Unrelated Immunosuppressed Females: A Coincidence or Not?

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### SUMMARY

**Introduction:** Scabies is identified as one of the neglected tropical diseases. It is extremely contagious with the potential to cause an outbreak if early, accurate diagnosis and effective medical management are not put in place. We present the unusual presentations of scabies in immunocompromised patients and their management. **Case Presentation:** We reported five cases of scabies including crusted scabies diagnosed in Sarawak General Hospital between March and April 2022. All patients had a rheumatological condition and required admission due to different reasons. **Management and outcome:** Each patient was managed separately and treated with permethrin 5%. All of them recovered. The investigation, management, and prevention of scabies outbreaks in healthcare facilities involving multiple disciplines were performed. Three cases acquired the scabies infection from the community with the remaining two having an indeterminate source of infection. **Epidemiology link in 2 patients could not be excluded. We screened 87 healthcare workers involved in patients' care. None of them had or developed scabies. Conclusion:** After thorough investigation, the clusters of scabies occurring is likely a coincidence. Precise diagnosis and effective medical management are required, encompassing both patients and healthcare workers to prevent an outbreak.

### INTRODUCTION

Scabies is an infestation with *Sarcoptes scabiei var hominis*. It is identified as one of the neglected tropical diseases.<sup>1</sup> It is extremely contagious and can cause an outbreak in an institution. The incubation period is three to six weeks for primary infestation but can be as short as one to three days in cases of re-infestation.<sup>2</sup> Scabies outbreaks are difficult to control and significantly impact public health in developed countries. It incurs significant economic losses relating to staffing and treatment.<sup>3</sup> Thus, it is important to have early and accurate diagnosis together with effective medical management of affected patients and healthcare settings, specific principles and strategies for disease management are required to prevent the spread of disease in the communities. This report aims to describe five cases of unusual presentation of scabies that occurred over a period of two months in four females with systemic lupus erythematosus (SLE) and another female with rheumatoid arthritis (RA) patients on immunosuppressive agents and how we managed a suspected scabies outbreak.

### CASE PRESENTATION

Five cases of scabies including a crusted scabies in this report occurred in the span of two months in Sarawak General Hospital. The clinical characteristics of the patients were summarized in Table I.

#### Case description

The first patient, a 28-year-old, lady a bird's nest processor, presented to the hospital for SLE with mucocutaneous flare on 15th March 2022. She complained of an itchy rash over the upper and lower limbs for four days. Her husband had similar symptoms. The patient had SLE diagnosed a year ago and she was taking daily prednisolone. Physical examination revealed discrete erythematous papules over the web spaces of the hands and feet. This was her fourth admission to the ward within 3 months for recalcitrant active SLE. Oral methotrexate was added to her existing systemic corticosteroids. Topical permethrin 5% was administered once a week for two doses.

Two weeks later, on 1st April 2022, a 35-year-old, housewife, presented to the hospital with acute SLE complicated with pericardial effusion. She had thick grey-yellow crusts on the skin throughout the body which had been occurring for 5 months. The initial lesions were intensely pruritic discrete red papules at the abdomen, slowly spreading to the chest and scalp. She did not have children. Family members under the same roof did not have similar symptoms. The patient had her SLE diagnosed 4 months prior. She was on high-dose systemic corticosteroid and oral azathioprine 50mg daily. Physical examination revealed moderately thick greyish-white-yellow crusts with surrounding erythema (Figure 1a&b). Scrapping of the crusted plaques at ear pinna examined under a microscope at 10x magnification revealed numerous mites, eggs, and faeces (Figure 1c). Topical therapies of permethrin 5% were administered. The patient was managed in an isolation room while in the ward. Her SLE was treated with pulse intravenous methylprednisolone for 3 days followed by mycophenolate mofetil 500 mg daily in addition to oral prednisolone 30 mg daily. Her symptoms improved gradually, and topical permethrin was continued daily for a total of four weeks and then continued once a week for another four weeks. Extended permethrin was given until clearance of the crust. She had post-scabies eczema which symptoms controlled with a topical corticosteroid (Figure 1 d & e). She was discharged home following 14 days of in-patient care.

This article was accepted: 17 September 2023

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Table 1: Summary of clinical characteristics of 5 females with rheumatological conditions who infested with scabies

Case	Age in years	Comorbid	Onset of scabies symptoms	Date of admission	Date presented to Dermatology	Source of infestation	Duration of immune-suppression	Type of Scabies	Treatment	Duration of recovery	Outcome
1	28	SLE	March 2022	15th March 2022	15th March 2022	Family	13 months	Classical	Permethrin 5% on the night once a week for 2 doses (Standard regimen)	2 weeks	Complete remission
2	35	SLE	Dec 2021	1st April 2022	1st April 2022	indeterminate	4 months	Crusted	Permethrin 5% on the night every day for 4 weeks then once a week for another 4 weeks	8 weeks	Post scabies eczema
3	25	SLE	March 2022	28th February 2022	18th April 2022	Ward	4 months (Cyclophosphamide Feb 2022)	Classical	Permethrin 5% on the night every week for 6 weeks	6 weeks	Post scabies eczema
4	68	RA	April 2022	20th April 2022	18th April 2022	Family	12 months	Classical	Permethrin 5% on the night once a week for 2 doses (Standard regimen)	2 weeks	Complete remission
5	46	SLE	March 2022	15 February 2022	21st April 2022	Family	4 months (Cyclophosphamide Jan 2022)	Classical	Permethrin 5% on the night once a week for 2 doses (Standard regimen)	2 weeks	Complete remission

SLE- systemic lupus erythematosus; RA – rheumatoid arthritis



**Fig. 2:** (a & b) Thick greyish-white-yellow crusts with surrounding erythema over the chest and scalp in patient 2; (c) Microscopic examination 10x magnification revealed numerous mites, eggs, and feces in skin with scrapped samples from ear pinna of patient 2; (d&e) thick plaques resolved with residual erythematous patches following 4 weeks of treatment in patient 2; (f) multiple papules over the umbilicus in patient 3.

Our third patient, a 25-year-old, lady, a research assistant, with underlying SLE diagnosed 18 months ago, presented to the hospital two weeks on 19th April 2022 while our second patient was managed in the isolation ward. She had a recent history of admission to the medical ward in late March 2022, with concomitant hospitalization of our second patient for SLE flare with gut lupus. She was given intravenous cyclophosphamide during her 4-day hospitalization in March 2022. There was no direct contact between the two patients in the ward. She presented with generalized itchiness immediately after being discharged from the ward early April 2023 for two weeks before being readmitted for scabies. Her younger brother who stayed under the same roof interestingly did not have similar symptoms. Physical examination revealed multiple discrete erythematous pruritic papules with excoriations involving the interdigital web spaces of hands and feet and umbilicus (Figure 1f). Topical permethrin 5% were administered. It was applied from neck to toe once a week for two weeks. She was discharged from the ward after 2 days with no adjustment of her immunosuppressant. However, her scabies symptoms did not improve, and her younger brother who stayed together had not been treated due to miscommunication, thus retreatment with permethrin 5% was given another 2 weeks together with the younger brother. Unfortunately, inadequate response was observed after 2 weeks with the appearance of new papules. Treatment was extended for another two weeks, and the method of application was re-emphasized. Complete resolution was observed at two months of treatment.

Our fourth case was a 68-year-old, housewife who presented to the Dermatology clinic on 18th April 2022 with generalized nocturnal itchiness for 5 days. She had

rheumatoid arthritis for a few years on prednisolone and sulfasalazine with good control. She had no recent admission to the ward except for regular follow-ups at the Rheumatology clinic. Her husband did not have similar symptoms. She did not have school-going children. Physical examination revealed multiple pustules over the armpit, fingers, scalp, and web spaces. Topical therapies of permethrin 5% were administered as an outpatient however, she was admitted a few days later as the scabies was complicated with right-hand cellulitis. Intravenous ampicillin with sulbactam was initiated. Her cellulitis responded to the antibiotic, and she was discharged home 4 days later with another 3 days of oral combination of ampicillin and sulbactam.

Our fifth case was a 46-year-old, housewife who presented to Dermatology Clinic with generalized pruritus for a month involving the bilateral hand, trunk, and lower limb, especially at night. Her husband also had similar symptoms for a week. Her son, an engineer, who stayed together, however did not have similar symptoms. She had SLE on prednisolone and immunosuppressant mycophenolate mofetil. She was hospitalized thrice within 4 months where in January she was given pulse intravenous cyclophosphamide. She had anemia with fluid overload and neutropenic sepsis which resulted in 2 hospital admissions in February 2022. Physical examinations revealed discrete papules over the hands' hand, trunk, and web spaces. Topical therapies of permethrin 5% were administered as an outpatient.

All the household members of the five patients were also treated with permethrin one dose on same-day patient-initiated treatment.

The measures to control disease transmission, including educating patients and families on the disease and cleaning contaminated clothing, home appliances, and other fomites were endorsed.

#### *Outbreak prevention management*

An outbreak was suspected due to the presentation of five patients with chronic rheumatological conditions who regularly attended the Rheumatology clinic. Three of them had frequent admission to the same medical ward in a month. The infection prevention and control team and Hospital Occupational Health and safety unit were notified. Investigations were done at the hospital level by both teams together with the Dermatology team.

Measures that were carried out in all 3 medical wards where the patients were admitted included a daily change of all in-patient bed linen. Bed linen laundry was handled as foul or infected. Briefly, the laundries were placed into an alginate bag and then into a secure outer bag. It will then be heat treated before washing with detergent and antiseptic. Contact precautions were practiced by all health care workers (HCWs) attending the patients until scabies treatment for the patient was completed and the rash had dried, and the crusts dropped off. The contact precaution includes wearing plastic aprons and disposable gloves when carrying out treatment or attending to patients' personal hygiene needs. Environmental cleaning using multipurpose disinfectant and quaternary ammonium compound disinfectant was done in all involved units.

A total of 88 staff including 62 nurses, 21 doctors, and 5 ward attendants from the Rheumatology clinic, Dermatology clinic, and 3 medical wards were screened over 2 days. Among them, only 24 had a history of contact with those scabies cases and had proper contact precautions when attending to patients' needs. During the interview, all of them had no symptoms or signs of scabies infection. All staff was offered prophylactic permethrin treatment. All staff was counseled regarding symptoms and signs of scabies. Scabies training includes explaining about scabies, its sign and symptoms, the incubation period, their treatment, and prevention. Leaflets were provided to each staff. After 6 months period, there was no scabies reported among the staff.

#### **DISCUSSION**

Human scabies is characterized by intense pruritus with nocturnal exacerbation and contagiousness.<sup>4</sup> The presence of scabietic nodules and skin burrows is pathognomonic. Scabies is suspected with the clinical history, skin morphology, and distribution and confirmed with the presence of mites, eggs, or faeces under light microscopic examination of the scrapped lesion. However, in patients who are immunocompromised, and on prolonged corticosteroids, nodular scabies can present with an atypical clinical pattern which is the crusted or Norwegian scabies.<sup>5</sup> This can be observed in our five cases where all of them had prolonged systemic corticosteroid therapy for their underlying conditions which were systemic lupus erythematosus (SLE) and rheumatoid arthritis. One of them presented with crusted scabies in which thick yellow crusts

were the main phenotype instead of classical discrete papules. It could be mistaken as other skin condition and lead to delay in diagnosis. Chronic use of corticosteroids is one of the most important factors for a delayed diagnosis of scabies in hospitalized patients.<sup>6</sup>

Crusted scabies is characterized by crusting of the skin with hyperkeratosis, which is caused by the hyperproliferation of mites as a result of the altered host response to the infestation. The hyperkeratotic plaques can carry up to 4000 mites per gram of skin compared to about 20 mites on the entire skin of individuals with ordinary scabies.<sup>7</sup> Various medical conditions such as cutaneous, neurologic, and immunologic diseases are risk factors for the development of crusted scabies.<sup>8</sup> Some congenital and acquired immunocompromised conditions which include human immunodeficiency virus (HIV), hematologic malignancy, neurologic illnesses, and SLE are also predisposed to crusted scabies.<sup>8</sup> Therefore, this hyper-infestation can cause an institutional outbreak if no prevention control is being put in place.

The immune system plays an important role in the clinical manifestation of the disease. In SLE, the immune system can be defective in so many ways. The leukocytes show functional abnormalities, such as defective phagocytosis, and decreased leukocyte chemotaxis. Cellular immunity is depressed too as is a selective humoral response to certain external antigens. It will be the trigger to make scabies in SLE more severe and florid than usual. The number of CD4+ was generally lower in patients with SLE compared to healthy individuals. Hence, the symptoms of pruritus are also lower in crusted scabies in SLE patients.<sup>9</sup> CD8+ were much more dominant than CD4+ in SLE patient. It is further hypothesized that these CD8+ T lymphocytes might be the cause of keratinocytes apoptosis leading to epidermal hyperproliferation in crusted scabies.<sup>10</sup>

Scabies may be introduced into the healthcare facility through an unrecognized infected new patient, visitors, or through healthcare workers who had scabies contact at home or community.<sup>11</sup> General contact through daily procedures such as helping to bathe a patient/resident, and any other extensive hands-on contact provides an opportunity for mite transmission. Mites also can be transmitted via contaminated clothing or bed linen. Fomites play a minor role in situations where the infestation in the source case is classical scabies. The inanimate environment of patients/residents with atypical scabies, however, is heavily contaminated with mature and immature mites.

After thorough investigation, our cases 1, 4, and 5 likely acquired scabies from the community due to the presence of similar symptoms among family members. There was no history of prior contact in the hospital. However, epidemiological link between case 2 and 3 could not be excluded as both had been managed in the same ward. Although there was no evidence of direct skin-to-skin contact among both, indirect contact with contaminated material could have been occurred. They were both admitted to the ward during COVID-19 pandemic when all healthcare workers practiced COVID-19 standard precaution with personal protective equipment. These may have prevented our staff from acquiring scabies.



The risk of an institutional outbreak is high with crusted scabies. From a study by Lay et al., a review of 20 hospital outbreaks of scabies, 16 out of 19 index cases were crusted scabies.<sup>6</sup> Another review analyzing 19 outbreaks showing all but one of the index cases had crusted scabies.<sup>12</sup> A scabies outbreak was suspected in our medical wards due to the presence of more than two confirmed cases of scabies including crusted scabies over the span of a month. This fulfilled the scabies outbreak definition per the UK Health Security Agency (UKSHA) where the outbreak is defined as the presence of two (2) or more epidemiologically linked cases of scabies within eight weeks.<sup>13</sup> Scabies transmission from HCW can be suspected if there are two or more HCWs who worked in the same area of the facility, and who do not have any contact source outside the facility within the last six weeks. The severity of scabies transmission in a facility depends on the mite load, the level of care of the source case, as well as the duration of the exposure period.<sup>11</sup>

Outbreak management should include planning for personal protective equipment (PPE) and pharmacy supplies.<sup>11</sup> Thus, measures need to be taken up early to prevent outbreaks in healthcare facilities. The action was taken to notify the Infection control and prevention team and Occupational Health and Safety team so that investigations can be carried out to look for a possible source. Concomitantly, environment cleaning and education of ward staff regarding contact precautions and management of soiled linen were performed. Our team made swift action evaluating all HCWs in all affected units to identify and remove any HCWs with signs and symptoms of scabies. HCWs were also educated on how to make a quick evaluation and monitoring of patients who are in close contact. These were by recommendation by Scabies Prevention and Control Guidelines for Healthcare settings revised in July 2019.<sup>11</sup>

A person who had direct “hands-on” contact, handling contaminated clothing or bed linen, or slept in the same bed as the patient/resident during the exposure period is defined as a close contact. However, for crusted scabies, close contact includes persons who had substantial contact with an atypical scabies patient’s/resident’s environment, including HCWs who worked both regularly and temporarily in the same area as the patient/resident during the exposure period. If the patient/resident was placed in more than one area before control measures were initiated, each area is considered affected.<sup>11</sup>

We used permethrin 5% lotion for cases 1, 4, and 5. This is in accordance with the Malaysian Guideline for Management of Scabies in Adults and Children. For crusted scabies, the treatment includes a combination of oral ivermectin and permethrin. The European guideline for the management of scabies (2017) recommends a combination of topical permethrin 5% cream or benzoate lotion 25% (applied daily for 7 days, then twice weekly until the patient is cured) and oral ivermectin (200 micrograms/kg/dose, with food) as three (days 1, 2, and 8), five (days 1, 2, 8, 9, and 15), or seven doses (days 1, 2, 8, 9, 15, 22, and 29), depending on the severity of infection.<sup>14</sup> Ivermectin is not available in our institution, thus we decided to give permethrin 5% daily and liquid paraffin

to soften the crust, extended up to 4 weeks due to persistent thick plaque on weekly review. Subsequently frequency of application was reduced to once weekly till complete clearance.

As for case 3, the patient has been given permethrin 5% lotion for a total of 6 courses instead of the standard 2 courses for classical scabies because, after completion of 2 weeks of treatment, the patient had worsening pruritus where repeated skin scrapping showed the presence of mites’ eggs which compel us to repeat the treatment for her for a longer period of 4 weeks. Subsequently, the patient had resolved symptoms. Treatment failure should be considered if symptoms persist after 6 weeks of treatment completion and most cases of treatment failure are likely due to poor compliance to treatment, inadequate treatment, or re-infestation from untreated contacts.<sup>3</sup> To ensure treatment success, the correct application of topical permethrin is of cardinal importance. Treatment should be applied to the whole body (except the head and neck), including web spaces of fingers and toes, the genitalia, and under the nails. However, in elderly and immunocompromised people the application should be extended to the scalp, neck, face, and ears. Treatment should be reapplied to the hands if they wash them during the treatment period. All members of the affected household should be treated at the same time. The application should be washed off after 12 hours for permethrin and clothes and bed linen machine washed at temperatures above 50°C.<sup>15</sup>

### CONCLUSION

In conclusion, we described five unrelated females with SLE and RA who had scabies within 2 months, two of whom may be epidemiologically linked. The rest were likely coincidental. Scabies outbreaks could happen in a hospital setting. Precise diagnosis, prompt action with effective remedial measures is required to prevent or to control scabies outbreak in hospital.

### LEARNING POINTS

- In patients who are on long-term immunosuppressants and immunocompromised, we will need to have high index of suspicion for scabies as the patients can have atypical presentations. They also require close monitoring to ensure clearance.
- Vigilant monitoring of contacts and surveillance of scabies outbreak in institutions is important to prevent institutional outbreak.

### DECLARATIONS

None to declare.

### ETHICAL APPROVAL AND CONSENT TO PARTICIPATE

This article does contain studies with the human participant and was registered via the National Medical Research Register, Ministry of Health Malaysia with ID NMRR ID-22-01692-YQW

#### CONSENT FOR PUBLICATION

Written informed consent was obtained from all participants

#### CONFLICT OF INTEREST

The authors declare no competing interests

#### FUNDING

The authors declare no financial disclosure

#### AUTHOR'S CONTRIBUTION

IPLT was responsible for the study design, data collection, manuscript writing, HGT, YT, and JWK, and participated in data collection. MMT was involved in the discussion, manuscript editing, and language proofreading. All authors read and approved the final manuscript.

#### AVAILABILITY OF DATA AND MATERIALS

The data supporting this study's findings are available from the Medical Records Unit, Sarawak General Hospital. However, restrictions apply to the availability of these data, which were used under special written permission and consent of patients for the current case report and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of the Medical Records Unit, Sarawak General Hospital, and Ministry of Health, Malaysia.

#### ACKNOWLEDGMENT

The author would like to thank the Director-General of Health Malaysia for the permission to publish this paper. We acknowledge Rheumatology team in collaboration in patients' managements and all the staff of Department of Dermatology Sarawak General Hospital in the data collection.

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