SKIN

IN-DEPTH REVIEW

Challenges in Public Health: The Diagnosis and Treatment of Crusted Scabies

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ABSTRACT

Introduction: Common scabies is a parasitic dermatologic condition that often presents as an extremely pruritic rash. A rare and highly contagious variant of common scabies is crusted scabies, formerly known as Norwegian scabies. While infection with common scabies typically involves 10 to 20 mites, individuals with crusted scabies are burdened with thousands to millions of mites. Crusted scabies is characterized clinically by hyperkeratotic papules and plaques, most commonly on the palms and soles. Due to the variety of presentations seen in scabies, it can be difficult to diagnose.
Case presentations: We present four cases of crusted scabies. An 89-year-old male with a history of dementia presented with a two-month history of a generalized pruritic rash. A 22-year-old male with a history of trisomy 21 presented with a 10-month history of mildly pruritic rash on the hands. A 54-year-old female with a history of trisomy 21 and cutaneous T-cell lymphoma presented with a three-week history of a generalized pruritic rash. Lastly, a five-year-old male with acute lymphoblastic leukemia with a minimally pruritic rash on his hands and elbows that had spread to the genitals. The patients were diagnosed with skin scrapings or biopsy showing scabies mites. These patients were all treated with extended courses of oral and topical anti-parasitic medications.
Discussion/Conclusion: Crusted scabies poses a significant challenge to public health as a severe variant of scabies associated with high morbidity and mortality. It is most commonly seen in persons who are immunosuppressed, have an underlying neurologic disorder, or are immobile. Patients may present with skin eruption and pruritus. Patients can also present with severe illness such as erythroderma, which poses a risk for hypothermia, acute respiratory distress syndrome, sepsis, and high-output heart failure. Scabies-related mortality in crusted scabies is high. Management of crusted scabies is different than for other types of scabies because the patient is infested with large numbers of mites. Patients may also have an altered immune response. Treatment of crusted scabies requires a combination of oral and topical treatments. Lastly, the large number of mites in crusted scabies requires more rigorous evaluation and treatment of contacts than other types of scabies. This is necessary to prevent or limit scabies outbreaks and re-infection. As many patients with crusted scabies live in congregate facilities, this requires prompt evaluation of contacts with treatment of cases and public health treatment of asymptomatic residents, staff, and visitors.

INTRODUCTION

Scabies is a parasitic dermatologic condition caused by the ectoparasite *Sarcoptes scabiei var hominis* that commonly presents with intense pruritus.[1-5] The female scabies mites burrow into the stratum corneum of the skin to lay eggs.[6] The mites, in conjunction with their ova and stool (scybala), induce a cutaneous hypersensitivity reaction, resulting in pruritus.[6] This is a delayed type IV hypersensitivity reaction, and symptoms can take up to six weeks to appear following infestation.[7] Thus, individuals are contagious long before they develop symptoms.[7] Scabies is most easily spread through direct skin-to-skin contact, although it can also be transmitted indirectly by fomites.[8] The World Health Organization (WHO) includes scabies as a "Neglected Tropical Disease" and estimates its worldwide prevalence as 200 million cases.[9]

Scabies can be difficult to diagnose due to the various ways it may present.[5] Scabies can be categorized based on its presentation into common, bullous, nodular, and crusted scabies.[2,4,5] Common scabies presents with red papules, excoriations, and hemorrhagic crusts from scratching.[2,4,10] The classic clinical presentation of common scabies involves pruritic papules, often affecting areas such as the interdigital webspaces, areolae, genital region, wrists, axillae, flexor surfaces, and umbilicus.[11] In adults, the face is typically spared.[11] Bullous scabies presents similarly to common scabies but with tense or flaccid bullae that can be pruritic.[2,5] Nodular scabies is characterized by pruritic nodules resulting from a host hypersensitivity reaction to *Sarcoptes scabiei* during active infection or, more commonly, persisting following resolution.[12] Crusted scabies is a rare and highly contagious variant of scabies.[1] Crusted scabies presents with thick, fissured hyperkeratotic plaques that can involve any part of the body, including the face and scalp, but typically involve the palms and soles.[2,3,5] This variant has a large number of mites, which is more infectious and persistent, making it more difficult to treat.[3] Persons with crusted scabies may not be the index case, but they are commonly the core transmitters of scabies in institutional outbreaks.[13,14]

Both common and crusted scabies present a diagnostic challenge due to their variable presentations and shared features with other dermatological conditions.[15-20] One retrospective study found that of 428 scabies cases, 45% were initially misdiagnosed.[21] The diagnosis of common scabies is often delayed for several reasons, including the absence of symptoms, the presence of atypical or non-specific symptoms, or the inability to express one's symptoms.[15-17] Skin biopsies of patients with common scabies are frequently negative for scabies mites and, instead, demonstrate an inflammatory pattern seen in many disorders, characterized by epidermal spongiosis and perivascular and diffuse mixed cellular infiltrate with eosinophils.[22] Patients with crusted scabies are more likely to have skin biopsies that reveal scabies mites due to the larger quantity of mites.[23] However, the clinical manifestations of crusted scabies complicate diagnosis. For example, the thick, pruritic plaques and nail dystrophy seen in crusted scabies may resemble the clinical presentation of psoriasis.[18-20] Contrary to common scabies, crusted scabies may or may not present with pruritus.[6] Moreover, as it involves widespread infection, making it more difficult to appreciate a pattern of distribution, it is much more likely than common scabies to affect the face and scalp.[11] Certain risk factors can predispose individuals to developing this variant of scabies including those who are

immunocompromised, have neurologic conditions, have trisomy 21, or reside in congregate living settings.[1,2,5,14,24] As such, clinical diagnosis of crusted scabies should be guided by a thorough evaluation of medical and social history, with special consideration for predisposing risk factors.[25,26] The barriers to early diagnosis and treatment of crusted scabies threaten public health, as it is particularly contagious due to the large mite load.[1] Failing to implement strategies to prevent scabies spread can result in avoidable mass outbreaks.

Dermoscopy assists in the clinical diagnosis of scabies. It allows clinicians to quickly evaluate for the presence of scabies mite burrows without employing invasive techniques or having a microscope. The "delta wing jet" sign is a very specific and characteristic dermoscopic finding of a mite burrow with visualization of the gnathosoma, which is the mite's head-like structure.[27] The gnathosoma appears as a small, dark brown triangular shape at the end of the burrow. Sometimes, ova and scybala can be observed distributed along the length of the burrow.[27] The presence of these dermoscopy findings in conjunction with history and clinical presentation can provide greater diagnostic efficiency while maintaining accuracy.[28] Notably, one study reported sensitivities of 91% for dermoscopy compared to 90% for traditional microscopy of skin scrapings.[28]

The cases presented in this study demonstrate the importance of key historical features in the diagnosis and management of crusted scabies. Of the four cases, two involved congregate living situations, two had trisomy 21, one had cutaneous T-cell lymphoma, one had acute lymphoblastic leukemia, and two were immunosuppressed. All four individuals had initial complaints of a long-standing, crusted, pruritic rash. All had microscopic confirmation of scabies eggs, scybala, and mites. All four resolved with anti-parasitic treatment but with nuances. Here we present four cases of crusted scabies to illustrate the differences between presentation and management of crusted scabies and to highlight the importance of public health interventions for this condition.

CASE PRESENTATIONS

Case 1.

An 89-year-old male with dementia who resided in a memory care facility, presented with a two-month history of a generalized pruritic rash. The rash had begun on the back but then spread to involve the whole body including the palms, soles, and genitalia but sparing the face. He was treated with topical steroids and oral doxycycline with minimal improvement in symptoms. The family reported that the patient had been losing weight. Due to his dementia, he would sometimes forget to eat. He was often diaphoretic but would frequently complain of feeling cold. Workup had previously been performed and was significant for neutropenia.

Patient temperature was 97.1F, heart rate was 91 beats per minute, and blood pressure was 91/66. The patient was complaining of feeling cold while wearing multiple layers of clothing. His clothing was damp due to the sweat. He appeared cachectic and was continuously scratching. His skin felt warm through gloves. The patient had generalized erythema with red papules with a fine sand-like scale covering the whole body from the scalp to the feet, sparing the face. There were areas of thicker hyperkeratotic scale along the chest wall and back (**Figure 1**). A skin scraping of the hand and trunk was performed and assessed. Microscopic

Figure 1. 89-year-old cachectic, erythrodermic male (A). There are scattered red papules coalescing into plaques and sand-like scales with a few scattered white hyperkeratotic scales on the back (B) and trunk (C). There are pinpoint red papules with coarse white scales on the palms (D).

examination showed multiple ova, scybala, and a mite confirming the diagnosis of crusted scabies. Public health treatment of the community and staff was recommended and not done.

The patient was treated with oral ivermectin 200mcg/kg and topical permethrin on days 1,2,8,9,15,22, and 29. The patient was prescribed topical triamcinolone 0.1% ointment to apply twice daily for symptomatic relief. One week following the patient's visit, he passed away due to COVID.

Case 2.

A 22-year-old male presented with a 10-month history of a mildly pruritic, thick, scaly rash on his bilateral hands. His medical history was significant for trisomy 21. He also had a generalized non-pruritic rash on his trunk, arms, and legs. He had previously seen multiple clinicians who had prescribed him multiple medications. He lives with his family, and no one else in the home was symptomatic. He appeared comfortable and was not scratching. There were thick, hyperkeratotic, white-yellow scaly plaques on the bilateral hands with onycholysis of the fingernails (**Figure 2**). On the trunk, arms, and legs were pinpoint red papules with overlying hemorrhagic crust. Microscopic examination showed multiple ova and scybala. A biopsy of the hand was performed which showed multiple scabies mites in the stratum corneum (**Figure 3**).

The patient was treated with oral ivermectin 200mcg/kg and topical permethrin 5% on days 1,2,8,9,15,22, and 29. The patient was prescribed doxepin 10mg once daily for symptomatic relief. He was noted to have complete resolution of scaling and minimal pruritus within two weeks of initiating treatment. Public health treatment was recommended to the two household contacts and declined by both as they were uninsured and asymptomatic.

Case 3.

Figure 2. Scattered red papules coalescing into plaques with areas of thick, hyperkeratotic, white-yellow scaly plaques with a “rocky”, “piled-up sand-like” appearance on the digits and palms (A) of the bilateral hands with onycholysis of the fingernails (B).

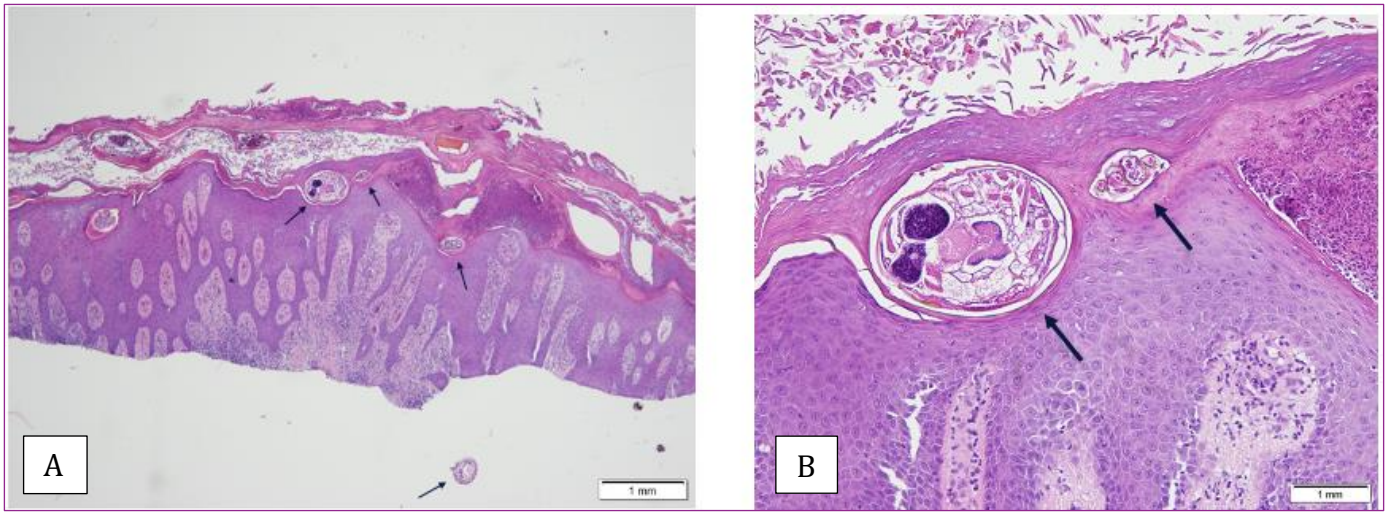

Figure 3. Marked epidermal hyperplasia with spongiosis. There is a mixed inflammatory infiltrate in the dermis (A). There is also a very thick stratum corneum containing multiple scabies mites (black arrows) (B). There are holes in the stratum corneum where scabies mites have fallen out during processing. One of the mites that had fallen out is visible below the tissue sample (A).

A 54-year-old female with a history of cutaneous T-cell lymphoma and trisomy 21 presented with a generalized rash persisting for several weeks, accompanied by two weeks of severe pruritus. She had been previously treated with topical steroids with mild improvement in symptoms. She lived in an assisted living facility. No residents or employees had a similar rash. On physical exam, there were red scaly papules coalescing into plaques on the palmar hands, feet, and upper and lower extremities with fine white-yellow sand-like scales on the skin folds of the hands (**Figure 4**). A skin scraping of the hand was performed and assessed. Microscopic examination showed multiple ova, scybala, and a mite confirming the diagnosis of crusted scabies (**Figure 5**).

The patient was treated with oral ivermectin 200 mcg/kg on days 1,2,8,9,15. The patient was prescribed topical permethrin 5% to apply once daily for seven days, then twice weekly to resolution of symptoms. Public health treatment of the community and staff was recommended and not done. Following

Figure 4. Pinpoint red papules coalescing into plaques with fine yellow-white sand-like scales (black arrows) in the palmar creases.

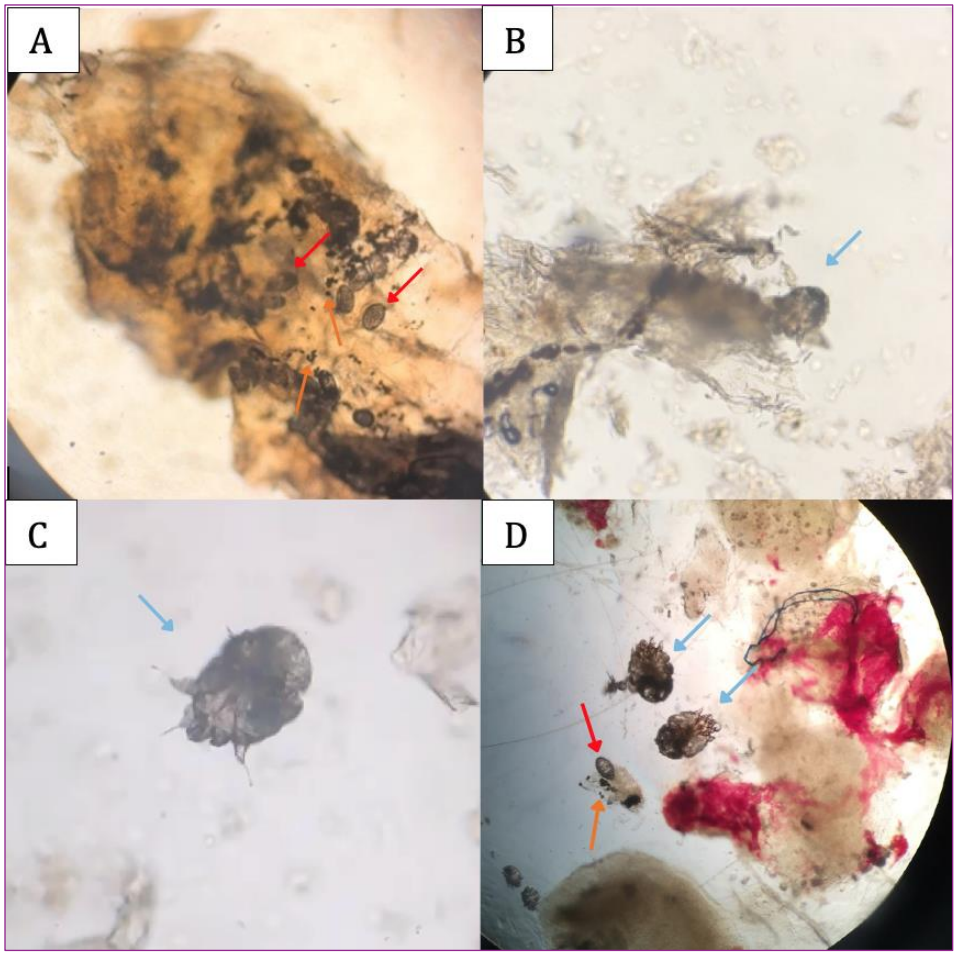

Figure 5. Microscopic findings (10X) of skin scrapings showing ova (red arrows- A&D), scybala (orange arrows- A&D), and scabies mites (blue arrows- B,C,&D).

diagnosis, the patient was placed in isolation at the assisted living facility until she received medical clearance on follow-up. Two symptomatic family members were treated by their primary care clinician.

Five months later, the patient experienced a recurrence of symptoms, with itchiness on her hands and legs. Her mother had a pruritic rash the previous week, which resolved with full-body topical permethrin treatment. Physical exam revealed thin crusted plaques and eroded papules over the hands, including the interdigital spaces, wrists, and legs. Dermoscopy demonstrated numerous mite burrows, with visualization of the "delta wing jet" sign (**Figure 6**).[27] The patient was treated with Spinosad 0.9% topical suspension and oral ivermectin 200 mcg/kg on days 1,2,8.

Case 4.

A five-year-old male was being treated with a chemotherapy regimen for acute lymphoblastic leukemia. He presented with crusted plaques on his hands and elbows that had been present for several months. He was referred for evaluation after the eruption spread to his genital area. He denied pruritus, and his parents confirmed he rarely scratched. On further questioning, he admitted to minimal pruritus. The lesions were predominantly distributed over the bilateral hands, with a particular concentration in the interdigital web spaces and anterior wrists. Additional lesions were noted on his elbows and penile shaft (**Figure 7**). Microscopic examination showed multiple mites, ova, and scybala. His parents and two siblings were asymptomatic. The patient was treated with oral ivermectin 200 mcg/kg on days 1 and 15. He was prescribed topical permethrin 5% on days 1 and 15. The entire family was treated simultaneously with the patient with topical permethrin 5%.

DISCUSSION

In 2017, the WHO listed scabies as a neglected tropical disease with the goal of coordinating better control of the disease.[1,2,5,29] It is estimated that scabies has a prevalence between 145-300 million infested persons globally.[1,2,4,5] While most prevalent in tropical, impoverished, and crowded regions, it is also seen in developed nations.[1,2] In developed countries, outbreaks are often seen in persons who are incarcerated, homeless, in assisted living, or other congregate living settings.[2,4,5]

Crusted scabies is a highly contagious form of scabies. It is often seen in persons who are immunocompromised, have underlying neurological conditions that reduce the ability to communicate, sensation, or mobility, and those with underlying genetic susceptibility.[1,5] These individuals may not experience symptoms such as itching, even beyond eight weeks of exposure. In a study of 61 elderly individuals with scabies in congregate living facilities, Cassell et al. found that 51% were asymptomatic.[13] Our Cases 2 and 4 did not complain of itching. Dementia, as demonstrated in Case 1, was also identified as a risk factor in this population.[13] Similarly, individuals with trisomy 21, as seen in Cases 2 and 3, are also at increased risk for developing crusted scabies, although the underlying cause remains unclear.[14,24] One hypothesis suggests that intellectual impairment may reduce the perception of pruritus in this population, or immune impairments may weaken defenses, increasing susceptibility to crusted scabies.[14,24]

Crusted scabies presents with thick, hyperkeratotic scales. These are described as "rocky" or piled-up "sand-like" scale and

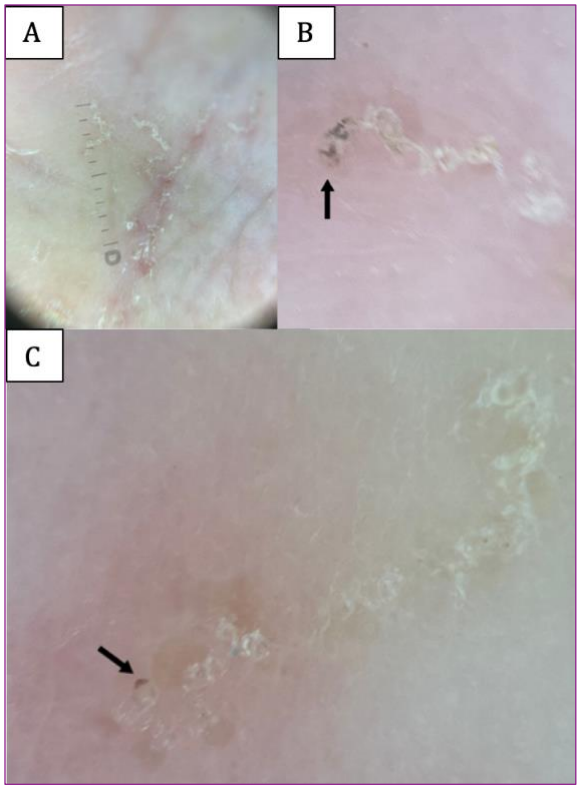

Figure 6. “Delta wing jet” sign on dermoscopy depicting occupied scabies mite burrows (A). The black arrows (B&C) indicate gnathosoma (head-like structure of the mite).

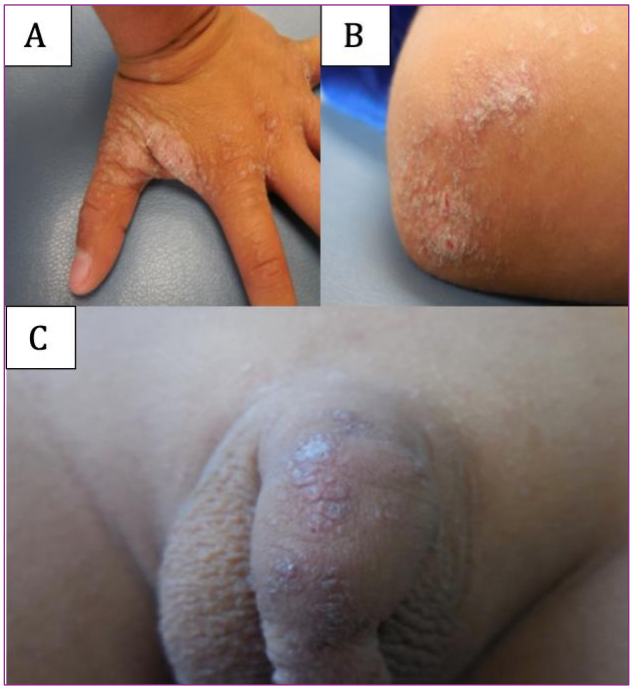

Figure 7. Thick, hyperkeratotic papules and plaques with white, “sand-like” crusted scales are present in the webspace of the hand (A) and on the extensor“sand-like” surface of the elbow (B). There are minimal excoriations on interdigital space between the thumb, index finger, and elbow plaques (A). There are similar “sand-like” crusted papules and plaques on the penile shaft (C).

as granular papules and plaques, classically on the palms and soles, but can affect any part of the body.[2,3,5] All four presented cases demonstrated this type of scale and all had palmar involvement. Due to its hyperkeratotic appearance, it may be mistaken for psoriasis, hyperkeratotic eczema, palmoplantar keratoderma, mycosis fungoides, or Sezary syndrome.[1,2] In comparison to common scabies, with infestations of five to 20 mites, individuals with crusted scabies can have infestations with thousands to millions of mites.[10] Timely diagnosis of crusted scabies is critical, as delay can increase the risk of transmission, lead to complications, and reduce quality of life.[30]

Due to scabies mimicking other more common dermatologic diseases and its variable appearance, crusted scabies is particularly difficult to identify. Thus, patient history and thorough physical exam play an essential role in diagnosis.[31] All four of our patients presented with different symptoms and physical exam findings. In addition to personal medical history, social history should be extensively considered. Recent exposure to contacts with new-onset pruritic rash might suggest a transmissible cause and place scabies on the differential diagnosis.[26] Chronicity and onset can also guide clinical judgment. Additionally, techniques such as dermoscopy (**Figure 6**), utilized in Case 3, can aid in the visualization of scabies burrows and mites.[26] Skin scrapings which can be done rapidly in the clinic, as performed in Cases 1, 3, and 4 can provide immediate confirmation of the clinical diagnosis through the identification of mites, ova, and/or scybala on microscopy. High mite load clinical suspicion of crusted scabies increases the probability of diagnosis by these methods.[23] Skin biopsy, as in Case 2, can also confirm a clinical diagnosis of crusted scabies.

It is believed that crusted scabies produces a different immunological response compared to common scabies, which explains its hyperkeratotic and diffuse nature.[3,10] As was observed in these cases, each of these patients had underlying risk factors that predisposed them to developing crusted scabies, such as dementia, trisomy 21, immunosuppression from chemotherapy, and cutaneous T-cell lymphoma.

Scabies lesions are commonly secondarily infected because of breaches of the skin barrier from scratching.[2,10] This results in local soft tissue infections including impetigo, cellulitis, and abscesses due to staphylococcal and streptococcal species.[2] Untreated infections may lead to bacteremia and infections in typically sterile sites, such as the bloodstream, joints, or internal organs, distant from the skin.[2,5,10] Crusted scabies is estimated to have a one-year mortality rate of 26% with the majority of deaths due to sepsis and secondary infections.[10,32] Other serious complications of scabies-related infections such as streptococcal scalded skin syndrome, rheumatic fever, rheumatic heart disease, post-streptococcal glomerulonephritis, and necrotizing soft tissue infections have been associated with crusted scabies.[1,2]

These cases demonstrate some of the complications that can be associated with crusted scabies. One of our four patients died soon after the diagnosis (Case 1). While the patient in Case 1 did not die directly from a scabies-related cause it is possible that his death was indirectly related. He was highly symptomatic, not sleeping, not eating, was hypermetabolic, and losing weight at presentation. While his death was attributed to COVID infection both being underweight and overweight are associated with an increased risk of COVID mortality.[33,34]

Case 1 had erythoderma. In the setting of erythroderma, patients are unable to regulate their body temperature from widespread vasodilation. The patient complained continuously to his caregivers and at the clinic of feeling cold, and his body temperature was 97.1F. He was erythrodermic on exam which can also lead to high-output heart failure and death. [1,35] Delayed diagnosis increases the risk of secondary complications with increased disease burden. This leads to decreased quality of life for both patients and their contacts.[1,36,37] Delayed diagnosis also increases the burden upon the healthcare system and unnecessary use of antibiotics, as infections that could have been managed earlier with appropriate care instead progress to severe stages requiring prolonged or more aggressive antibiotic treatment.[38] This not only strains healthcare resources but also contributes to the growing issue of antimicrobial resistance.[38]

The high mite burden in conjunction with the altered immunologic response makes crusted scabies more difficult to treat than common scabies.[2,3,10] Treatment of crusted scabies is both longer and requires more frequent dosing when compared to common scabies. The Centers for Disease Control and Prevention recommends a combination of permethrin and ivermectin.[39] There are other combinations of oral and topical medication that include oral ivermectin, topical permethrin, benzyl benzoate, precipitated sulfur, salicylic acid, and/or malathion.[1,2] When using ivermectin, multiple doses are required, as it is not ovicidal.[40] Before applying topical treatments, thick scales should be removed or debulked using keratolytic agents, such as urea, to improve drug penetration.[1] For widespread hyperkeratosis, urea-based creams are generally preferred due to their safety profile.[41,42] For localized areas of marked hyperkeratosis, mechanical removal of crusts may also be necessary.[42] Treatment is complicated by the presence of thick crusts, which hinder the ability of topical medications to effectively penetrate the stratum corneum.[43,44] Nail involvement in crusted scabies also requires more aggressive therapy.[45] If patients are treated with regimes for common scabies there is a higher rate of treatment failure. Additionally, due to its highly contagious nature, it can cause outbreaks among close contacts.[1,2,4] Sometimes for debilitated impaired persons, admission to the hospital with isolation may be required to achieve appropriate treatment.[2,4,10] Together these factors plus the need to treat contacts simultaneously make effective treatment of crusted more difficult than common scabies. .[10,25]

Scabies mites can survive and penetrate the epidermis for about 24-36 hours at room temperature without a host. It is important to prevent fomite transmission by treating clothing, bedding, furniture, and other potentially contaminated items.[1] Treatment options for fomites include washing them at temperatures over 50˚ C for 10 minutes or sealing them in plastic bags for at least 72 hours.[1,46] When handling fomites, protective gear such as gloves, shoe covers, and gowns should be worn.[46] For objects that are unable to be treated using these methods, insecticides can be utilized instead.[1] It is also important to thoroughly clean and vacuum the rooms of affected individuals to account for sloughed skin crusts that may be contaminated.[46]

In the setting of crusted scabies, additional precautions are recommended to prevent the spread and reinfection of the disease. Some individuals may be asymptomatic carriers, remaining contagious even before developing cutaneous manifestations or pruritus.[1,2,4,5,29] All individuals infested with

scabies carry mites for a period of four to six weeks, although previously sensitized individuals may be symptomatic within hours to days.[2,5] Especially in cases of crusted scabies, pruritus is not always a presenting feature.[13] Some individuals, particularly those with health conditions that limit their sensory perception, may not experience itchiness.[13,24] Therefore, even asymptomatic individuals suspected of exposure to crusted scabies should be considered for treatment, as they may be infested and a source of further spread.[13] It is recommended that household and close contacts be treated empirically at the same time as the infested individual, even if they do not display symptoms.[1,2,4,5,46] Asynchronous treatment of index cases and asymptomatic infested contacts can result in reinfestation referred to as ping-ponging. Case 3 was re-infested and exemplifies the importance of in addition to adequate treatment of the patient, treatment of contacts, and treatment of fomites as described above. While treatment of close contacts is recommended in common scabies as well, this is crucially important in crusted scabies as it is much more contagious.

Public health treatment of asymptomatic contacts is a challenging concept to implement for patients, clinicians, and institutions. Recommending treatment of individuals other than their individual patient and persons without disease to prevent disease are unique clinical situations that can be resisted by the medical community. The majority of scabies outbreaks are related to crusted scabies in a congregate facility.[14] Crusted scabies requires an infection control assessment of infestation risk of the facility's employees, residents, and visitors.[14,46] Facilities without clinical experience in contact tracing can collaborate and get assistance from local public health departments.[14,46] There should be active surveillance for scabies with prophylactic treatment of asymptomatic contacts.[14]

The CDC outlines several guidelines for institutions to follow in response to a case or multiple cases of crusted scabies.[46] At the institutional level, effective treatment of crusted scabies encompasses not only individuals with direct contact but also those with indirect exposure.[1,46] This approach includes the treatment of those handling the laundry, visitors entering shared spaces, and even family members of exposed staff members.[1,46] Importantly, the institution should reach out to the local health department for help in conducting a comprehensive contact investigation, referencing records of visitors, staff, and other residents with potential exposure.[46] Visitor access to the affected patient should be restricted, with all permitted visitors required to follow strict precautionary measures to prevent infestation.[46] These measures can reduce the risk of widespread infestation in group facilities.[46]

Cases 1-3 all exemplify the difficulty in securing agreement from institutions for asymptomatic individuals to undergo treatment. Despite recommendations for treating contacts, none adhered. This lack of adherence to implementing established public health treatment strategies can result in mass outbreaks.[42] Case 3 underscores the importance of these measures. Such resistance is not met in the context of postexposure prophylaxis for meningococcal disease or following needlestick exposure to bloodborne pathogens such as HIV or HBV.[47,48] Postexposure prophylaxis for these illnesses demonstrates that widespread prophylactic treatment measures in completely asymptomatic individuals is feasible. As crusted scabies can impose a tremendous burden of morbidity and mortality in susceptible individuals, robust public

health measures are essential, particularly in vulnerable communities.

Public health efforts are complicated by the disproportionate impact of crusted scabies on individuals from vulnerable populations with existing barriers to healthcare.[1,49] These barriers are particularly pronounced among groups such as the elderly, individuals experiencing poverty, and those who are immunocompromised.[50] Persons living in congregate living settings are a particular challenge. This furthers the challenges of effective diagnosis and management.[50] Proactive public health treatment is important to addressing atypical cases and reaching those unlikely to seek care.[51]

In high-prevalence regions with adequate resources, mass population treatment may decrease the prevalence of the disease.[2,4,5,29,52] First, the detection of crusted scabies may be ameliorated by improved strategies for active case detection by screening populations and identifying susceptible individuals proactively.[51] Early detection permits early intervention, which is especially paramount due to the contagious nature of the condition. Additionally, studies have supported the efficacy of mass drug administration of topical permethrin or oral ivermectin in reducing crusted scabies prevalence in populations.[53-56] While oral drug administration has the advantage of improved adherence, particularly among asymptomatic community members, it carries a greater risk of adverse effects, such as neurotoxicity when compared to topical options.[53,54] Nonetheless, it is generally considered safe in the treatment of scabies.[53,54] The benefits of population treatment should be weighed against the potential risks of unnecessary treatment. Nonetheless, mass drug administration is a promising approach for communities that are widely impacted by scabies.[53-55] Similar models for population treatment in endemic communities may be critical in controlling the prevalence of the condition.[53-56]

CONCLUSION

Crusted scabies is a highly contagious form of scabies that often affects those with underlying immunologic and/or neurologic disease. Delay in the diagnosis of this condition can lead to increased healthcare burden, spread of the disease, decreased patient quality of life, and increases risk of infection and mortality. Due to infestation with hundreds of thousands to millions of mites, the parasite can be more easily transmitted from person to person than common scabies. Crusted scabies can even spread to persons not in direct contact with the patient. It is therefore recommended that all of those who have been in contact with the patient and their fomites be treated for the disease even if asymptomatic. Increased awareness of public health treatment is necessary to control and prevent scabies outbreaks.

Conflict of Interest Disclosures: None

Funding: None

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