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Unison Infestation: A Rare Case of Norwegian Scabies in a Mother-Baby Dyad

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A B S T R A C T

Norwegian scabies, also known as crusted scabies, is an uncommon but highly contagious skin disease caused by an infestation of the *Sarcoptes scabiei* mite. It is characterized by extensive crusting and scaling of the skin, often accompanied by intense itching. Norwegian scabies is typically seen in individuals with weakened immune systems or those who are unable to care for themselves properly. We reported a case of Norwegian scabies in a 33-year-old mother and her 9-month-old baby. The mother's symptoms began during her third trimester of pregnancy, and the baby became infected a few months after birth. Both patients presented with generalized pruritus and characteristic skin lesions. The baby was also found to be severely malnourished. In conclusion, this case highlights the importance of early diagnosis and treatment of Norwegian scabies, especially in vulnerable populations. Prompt and effective management can prevent complications and improve the quality of life for affected individuals.

1. Introduction

Scabies, a ubiquitous ectoparasitic infestation, wreaks havoc on human health, causing significant morbidity worldwide. It is caused by the *Sarcoptes scabiei* mite, an obligate human parasite that burrows into the epidermis and triggers an inflammatory response, leading to intense pruritus and characteristic skin lesions. The global prevalence of scabies is estimated to be around 200 million cases at any given time, with a disproportionate impact on resource-limited settings, overcrowded communities, and vulnerable populations. The classic presentation of scabies involves the hallmark features of nocturnal pruritus, erythematous papules, and burrows, typically affecting the interdigital spaces, wrists, elbows, axillae, and groin. However, scabies can also manifest atypically, particularly in individuals with compromised immune systems or underlying medical conditions.[1,2] Norwegian scabies, also known as crusted scabies, represents a rare but formidable variant of scabies, characterized by hyperkeratotic crusts teeming with millions of mites. It is primarily observed in individuals with impaired immune responses, such as those with HIV/AIDS, leprosy, lymphoma, or malnutrition, as well as those with neurological or cognitive impairments.[3,4]

The clinical presentation of Norwegian scabies often deviates from the classic form, with generalized erythema, scaling, and crusting, sometimes mimicking other dermatological conditions like psoriasis or eczema. The diagnosis can be challenging, requiring a high index of suspicion and meticulous microscopic examination of skin scrapings to identify the mites, eggs, or scybala (mite feces). The management of

Norwegian scabies necessitates a multifaceted approach, encompassing both topical and systemic therapies, along with rigorous hygiene practices and environmental control measures. The mainstay of treatment is topical scabicides, such as permethrin 5% cream or ivermectin 1% cream, applied to the entire body from the neck down and left on for an extended period. Oral ivermectin may be used as an adjunct in severe cases or in those who cannot tolerate topical treatment.[5,6]

In addition to pharmacological interventions, meticulous hygiene practices are paramount in controlling the spread of Norwegian scabies. This includes frequent bathing, washing all clothing and bedding in hot water, and vacuuming or cleaning living spaces. Close contacts of the infected individual should also be treated prophylactically to prevent further transmission.[7,8] The prognosis of Norwegian scabies is generally favorable with prompt and appropriate treatment. However, complications can arise, including secondary bacterial infections, sepsis, and even death, particularly in immunocompromised individuals. Therefore, early diagnosis and aggressive management are crucial to minimize morbidity and mortality associated with this rare but potentially life-threatening condition.[9,10] In this case report, we present a unique instance of Norwegian scabies affecting a mother-baby dyad, highlighting the challenges in diagnosis and management, particularly in the context of maternal-fetal transmission and the impact on neonatal health. This case underscores the importance of vigilance and prompt intervention in vulnerable populations to mitigate the adverse consequences of this highly contagious and potentially devastating disease.

2. Case Presentation

A 33-year-old female, Mrs. M, presented to the dermatology clinic with her 9-month-old infant, By. P, both complaining of severe and diffuse itching. The mother's symptoms had commenced during the third trimester of her pregnancy, approximately three months prior. Initially, she noticed small, intensely itchy papules in the interdigital spaces of her left hand. These lesions gradually spread to involve both hands, arms, and her torso. Despite the escalating discomfort, Mrs. M did not seek medical attention, attributing the rash to hormonal changes associated with pregnancy. Following the birth of By. P, the infant began exhibiting similar symptoms at around six months of age. The infant became increasingly irritable and restless, particularly at night, due to the unrelenting itch. The rash initially appeared on the infant's hands and rapidly disseminated to involve the entire body. Upon presentation at the clinic, both mother and infant appeared distressed due to the severity of the pruritus. Mrs. M reported disturbed sleep, fatigue, and anxiety related to her and her infant's condition. By. P exhibited poor feeding and weight loss, indicative of failure to thrive (Table 1).

Dermatological examination of Mrs. M revealed generalized erythematous papules, pustules, and excoriations with areas of crusting and scaling. These lesions were particularly prominent on the hands, wrists, elbows, axillae, and groin (Figure 2). Examination of By. P revealed a more severe presentation with extensive erythema, scaling, and thick, crusted plaques covering a large portion of the body (Figure 1). The infant's skin appeared dry and cracked, with areas of erosion and serous oozing. The scalp was also involved, with thick, adherent crusts. In addition to the dermatological findings, By. P exhibited signs of severe malnutrition, including generalized wasting, abdominal distension, and edema of the lower extremities. The infant's growth parameters were significantly below the normal range for age, with a weight of 4 kg and a height of 72 cm, placing the weight-for-height measurement below -3 standard deviations. A detailed history revealed that Mrs. M had not received any prenatal care during her pregnancy and had limited knowledge regarding hygiene practices. She reported infrequent bathing and a habit of sharing towels and bedding with family members. The family resided in a small, overcrowded dwelling with poor sanitation. The infant had been exclusively breastfed for the first six months of life but

had subsequently received a combination of breast milk and formula. However, due to the family's socioeconomic circumstances, access to adequate nutrition and healthcare was limited.

Based on the clinical presentation and the epidemiological context, a presumptive diagnosis of Norwegian scabies was made. To confirm the diagnosis, skin scrapings were obtained from both the mother and the infant. Microscopic examination of the samples revealed numerous *Sarcoptes scabiei* mites, eggs, and scybala, confirming the diagnosis (Figure 3). Further investigations were conducted to assess the overall health status of both patients. Laboratory tests for Mrs. M showed mild anemia and eosinophilia. By. P's laboratory tests revealed severe anemia, hypoalbuminemia, and electrolyte imbalances, consistent with severe malnutrition. The infant was also screened for other infections, including HIV, which was negative. Given the severity of the infestation and the infant's malnutrition, both Mrs. M and By. P were admitted to the hospital for comprehensive treatment and supportive care. Mrs. M was treated with topical permethrin 5% cream applied to the entire body from the neck down, repeated after one week. She also received oral antihistamines to alleviate the pruritus and topical corticosteroids to reduce inflammation. By. P was treated with topical permethrin 5% cream and received intensive nutritional support, including a high-protein diet and vitamin supplementation. Both patients were also given emollients to hydrate the skin and prevent cracking.

In addition to the medical management, the family received extensive education on hygiene practices and environmental control measures. They were advised to launder all clothing and bedding in hot water, vacuum or clean living spaces thoroughly, and avoid sharing personal items. The importance of regular bathing and handwashing was emphasized. The family was also linked with social services to address their socioeconomic needs and ensure access to adequate nutrition and healthcare. Following two weeks of inpatient treatment, both Mrs. M and By. P showed significant improvement. The pruritus had subsided, and the skin lesions were healing. By. P's nutritional status also improved, with weight gain and resolution of edema. Both patients were discharged home with instructions to continue topical treatment and follow-up with the dermatology clinic for regular monitoring.

This case highlights the challenges in diagnosing and managing Norwegian scabies, particularly in vulnerable populations with limited access to healthcare and education. The mother's delayed diagnosis and the subsequent transmission to her infant underscore the importance of early recognition and prompt treatment of this highly contagious condition. The infant's malnutrition further complicated the clinical picture and emphasized the need for comprehensive care, including nutritional support and social assistance. This case also demonstrates the importance of patient education and environmental control measures in preventing the spread of Norwegian scabies and ensuring successful treatment outcomes.

Figure 1. Clinical photograph of the infant with Norwegian scabies, showing generalized erythema, macules, papules, scales, erosions, and crusts.

Figure 2. Clinical photograph of the mother with Norwegian scabies, showing localized lesions on the hands, feet, and trunk.

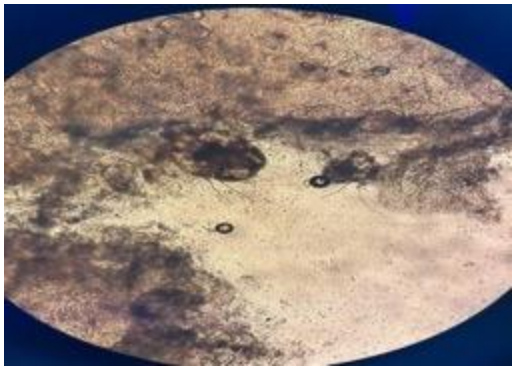

Figure 3. Microscopic image of skin scrapings showing *Sarcoptes scabiei* mites and eggs.

Table 1. Timeline of disease.

Timeline	Mother	Infant
First trimester (0-12 weeks)	Asymptomatic	Not applicable
Second trimester (13-27 weeks)	Asymptomatic	Not applicable
Third Trimester (28-40 weeks)	Onset of pruritus, initially mild - Lesions appear, starting with a small, pimple-like lesion on the left hand - Gradual spread of lesions to other fingers, hands, and arms	Not applicable
Delivery	Pruritus and lesions persist	Asymptomatic at birth
Postpartum (0-3 months)	Continued spread of lesions, now involving the trunk and legs - Increased intensity of pruritus, particularly at night. Development of secondary bacterial infection in some lesions	Remains asymptomatic
4-6 months postpartum	Pruritus and lesions persist	Onset of pruritus Appearance of erythematous macules, papules, and crusts on the hands and fingers Gradual spread of lesions to the entire body
7-9 months postpartum	Pruritus and lesions persist	Pruritus intensifies, disrupting sleep Lesions become more extensive, involving the scalp, face, and limbs Development of severe wasting (malnutrition)
Presentation to clinic	Generalized pruritus and lesions	Generalized pruritus and lesions Severe wasting

3. Discussion

Norwegian scabies, an enigmatic and often overlooked variant of scabies infestation, presents a formidable diagnostic challenge due to its remarkable ability to mimic a diverse array of dermatological conditions. Unlike classic scabies, which typically manifests with characteristic burrows and localized lesions, Norwegian scabies is distinguished by its atypical manifestations, often characterized by crusted plaques and generalized scaling. This clinical mimicry can lead to misdiagnosis, delayed treatment, and potentially serious consequences, particularly in vulnerable populations. Clinical mimicry, the phenomenon where one disease masquerades as another, is a common occurrence in dermatology. The skin, being the largest and most visible organ, often exhibits similar responses to a variety of insults, making it challenging to distinguish between different conditions based solely on clinical appearance. Norwegian scabies, with its protean manifestations, exemplifies this diagnostic dilemma. The hallmark of Norwegian scabies is the presence of thick, crusted plaques, often accompanied by generalized scaling and erythema. These lesions can readily mimic a wide range of dermatological conditions, including psoriasis, eczema, contact dermatitis, fungal infections, and ichthyosis, among others. This clinical resemblance can lead to misdiagnosis, as clinicians may initially focus on more common or familiar conditions, overlooking the possibility of Norwegian scabies. The absence of classic scabies features, such as burrows and localized lesions, can mislead clinicians, particularly those unfamiliar with the diverse presentations of Norwegian scabies. Norwegian scabies is relatively rare, making it less likely to be considered in the initial differential diagnosis. This is particularly true in settings where scabies is uncommon or in individuals without obvious risk factors. The ability of Norwegian scabies to mimic other dermatological conditions can lead to misdiagnosis, especially when the clinical presentation is ambiguous or overlaps with more common disorders. Many healthcare professionals may not be fully aware of the diverse presentations of Norwegian scabies, leading to missed or delayed diagnosis. Patients may delay seeking medical attention due to embarrassment, fear of stigmatization, or lack of access to healthcare. This delay can allow the infestation to progress and become more challenging to treat. In the case of Mrs. M, the initial symptoms of pruritus and skin rash were misattributed to pregnancy-related skin changes. This misattribution is understandable, given the common occurrence of dermatological manifestations during pregnancy. However, it highlights the importance of considering Norwegian scabies in the differential diagnosis of any atypical skin rash or persistent pruritus, even in individuals without obvious risk factors. The delay in diagnosis in Mrs. M's case allowed the scabies infestation to progress and spread to her infant, resulting in a more severe and challenging clinical scenario.

This case underscores the critical need for early recognition and prompt treatment of Norwegian scabies to prevent complications and limit transmission. To overcome the diagnostic challenges associated with Norwegian scabies, clinicians must maintain a high index of suspicion and employ a comprehensive approach. A detailed patient history, including information about risk factors, living conditions, and contact with individuals with scabies, can provide valuable clues. A careful examination of the entire skin surface, including the scalp, palms, and soles, is essential to identify subtle signs of scabies infestation. Skin scrapings and microscopic examination remain the gold standard for diagnosing scabies. Dermoscopy and skin biopsy may also be helpful in certain cases. Healthcare professionals should stay updated on the latest research and clinical guidelines regarding scabies, including Norwegian scabies. Patients should be educated about the signs and symptoms of scabies, risk factors, and the importance of early diagnosis and treatment. Norwegian scabies, also known as crusted scabies, is a rare and severe form of scabies that often presents a diagnostic challenge due to its atypical manifestations.

Unlike classic scabies, which is characterized by itchy burrows and papules, Norwegian scabies can mimic a variety of other skin disorders, leading to misdiagnosis and delayed treatment. Psoriasis, a chronic inflammatory skin disease, can bear a striking resemblance to Norwegian scabies. Both conditions can present with thick, erythematous plaques covered with silvery scales. Psoriasis typically affects the elbows, knees, scalp, and lower back, while Norwegian scabies can involve any area of the body. Itch is a hallmark of scabies, but it may not be as prominent in psoriasis. Psoriasis often affects the nails, causing pitting, thickening, and discoloration. Nail changes are less common in Norwegian scabies. Psoriasis has a strong genetic component, while Norwegian scabies is not inherited. Eczema, a common inflammatory skin condition, can also be difficult to distinguish from Norwegian scabies, especially in the early stages. Both conditions can present with dry, itchy, and inflamed skin. Eczema lesions are typically more polymorphic, with a mix of papules, vesicles, and crusts. Norwegian scabies lesions are often more uniform, with thick, crusted plaques. Eczema commonly affects the flexural surfaces, such as the antecubital and popliteal fossae. Norwegian scabies can involve any area of the body. Eczema often has a history of atopy, such as asthma or allergic rhinitis. Norwegian scabies is not associated with atopy. Contact dermatitis, an inflammatory skin reaction caused by exposure to irritants or allergens, can also mimic the distribution and appearance of Norwegian scabies lesions. Both conditions can present with erythema, scaling, and crusting. Contact dermatitis is typically associated with a history of exposure to a specific irritant or allergen. Norwegian scabies is caused by an infestation of mites. Contact dermatitis often follows a pattern consistent with the exposure, such as a linear streak or a well-demarcated area. Norwegian scabies can involve any area of the body. Patch testing can help identify the causative allergen in contact dermatitis. Patch testing is not useful in diagnosing Norwegian scabies. Superficial fungal infections, such as tinea corporis (ringworm), can present with scaly, erythematous patches that may be mistaken for Norwegian scabies. Fungal lesions often have a raised, well-defined border and central clearing. Norwegian scabies lesions are typically more diffuse and lack a distinct border. KOH examination of skin scrapings can reveal fungal hyphae in fungal infections. Norwegian scabies is diagnosed by the presence of mites, eggs, or scibala. Fungal infections typically respond to topical or oral antifungal medications. Norwegian scabies requires treatment with scabicides. Ichthyosis, a group of genetic disorders that cause dry, thickened, and scaly skin, can resemble the hyperkeratotic lesions of Norwegian scabies. Ichthyosis typically presents in infancy or early childhood. Norwegian scabies can occur at any age. Ichthyosis often affects the entire body, including the palms and soles. Norwegian scabies can involve any area of the body, but the palms and soles are less commonly affected. Ichthyosis has a strong genetic component, while Norwegian scabies is not inherited. The clinical mimicry of Norwegian scabies underscores the importance of a thorough dermatological examination and a detailed patient history to identify subtle clues that may point towards the diagnosis. Clinicians should pay close attention to the distribution, morphology, and associated symptoms of the skin lesions. A careful review of the patient's medical history, including any risk factors for Norwegian scabies, is also essential. In addition to the clinical examination, appropriate diagnostic tests, such as skin scrapings and microscopic examination, should be performed to confirm the diagnosis. Dermoscopy and skin biopsy may also be helpful in certain cases. Individuals with weakened immune systems are at increased risk of developing Norwegian scabies.

The immune system plays a critical role in controlling the proliferation of the *Sarcoptes scabiei* mite, the causative agent of scabies. In immunocompromised individuals, the mites can multiply unchecked, leading to the hyperinfestation characteristic of Norwegian scabies. Human immunodeficiency virus (HIV) infection, particularly in

advanced stages, severely impairs the immune system, making individuals highly susceptible to opportunistic infections, including Norwegian scabies. Patients who have undergone organ transplantation require immunosuppressive medications to prevent rejection of the transplanted organ. These medications can increase the risk of infections, including Norwegian scabies. Cancer patients undergoing chemotherapy often experience immunosuppression as a side effect of the treatment, making them more vulnerable to infections, including Norwegian scabies. Individuals with other primary or secondary immunodeficiency disorders, such as leukemia, lymphoma, or malnutrition, are also at increased risk of developing Norwegian scabies.

Malnutrition, a state of inadequate nutrition, can compromise immune function and predispose individuals to severe scabies infestations, including Norwegian scabies. Malnutrition can result from various factors, including poverty, food insecurity, and underlying medical conditions. The immune system relies on adequate nutrition to function optimally. Malnutrition can impair the production of immune cells and antibodies, weakening the body's defense against infections. In the context of scabies, malnutrition can lead to a more severe infestation, as the mites can multiply unchecked in the absence of an effective immune response. Patients with neurological conditions, such as dementia, stroke, or peripheral neuropathy, may have reduced sensation or cognitive impairment, hindering their ability to recognize and respond to the itch caused by scabies mites. This can lead to extensive mite proliferation and the development of Norwegian scabies. The itch associated with scabies is a crucial defense mechanism that alerts individuals to the presence of mites and prompts them to scratch. Scratching, although it can damage the skin, also helps to dislodge mites and limit their spread. In individuals with neurological impairment, the reduced sensation or cognitive impairment can prevent them from effectively responding to the itch, allowing the mites to multiply unchecked. Residents of long-term care facilities, prisons, or other institutional settings are at higher risk of developing Norwegian scabies due to close contact and potential for rapid spread. These settings often house individuals with underlying medical conditions or disabilities, who may be more susceptible to severe scabies infestations. The close proximity of individuals in institutional settings facilitates the transmission of scabies mites. Shared living spaces, communal bathing facilities, and contact with healthcare providers or staff can all contribute to the spread of scabies. In addition, individuals in institutional settings may have difficulty maintaining proper hygiene, further increasing their risk of infection.

Norwegian scabies, a severe form of scabies infestation, often presents a diagnostic challenge due to its atypical manifestations. Unlike classic scabies, which is characterized by itchy burrows and papules, Norwegian scabies can mimic a variety of other skin disorders, making it difficult to diagnose based on clinical presentation alone. Therefore, laboratory confirmation is essential for definitive diagnosis and prompt treatment. The gold standard for diagnosing Norwegian scabies is the identification of the *Sarcoptes scabiei* mite, its eggs, or scybala (mite feces) through microscopic examination. Skin scrapings are obtained from the affected areas, typically the crusted plaques or burrows, and examined under a microscope after preparation with potassium hydroxide (KOH) solution. Identify the most promising lesions for sampling, such as crusted plaques, burrows, or areas with active excoriation. Cleanse the skin with alcohol to remove surface debris and bacteria. Using a sterile scalpel blade, gently scrape the lesion until a small amount of tissue and serous fluid is obtained. Transfer the scraped material onto a clean glass slide. Add a drop of 10% KOH solution to the specimen to dissolve keratin and enhance visualization of the mites, eggs, or scybala. Examine the slide under a light microscope at low and high magnification. Adult female mites are approximately 0.4 mm in size and have a rounded body with four pairs of legs. Scabies eggs are oval-shaped and approximately 0.15 mm in size. Scybala are dark brown, cylindrical fecal pellets produced by

the mites. The presence of any of these findings confirms the diagnosis of Norwegian scabies. However, the absence of mites, eggs, or scybala does not rule out the diagnosis, as the mite burden can vary depending on the stage and severity of the infestation. Dermoscopy, a non-invasive technique that uses a handheld device to magnify the skin, can also aid in the diagnosis of scabies. Dermoscopy allows for visualization of the skin structures in greater detail, potentially revealing subtle signs of scabies infestation. Dermoscopy can sometimes visualize the mite itself, appearing as a dark, triangular structure with legs. Scabies burrows can appear as dark, wavy lines on dermoscopy. Scabies eggs can be seen as delta-wing-shaped structures on dermoscopy. While dermoscopy can be a helpful adjunct to skin scrapings, it is not as sensitive or specific as microscopic examination. Dermoscopy may be particularly useful in cases where skin scrapings are difficult to obtain or when the clinical presentation is ambiguous. In some cases, a skin biopsy may be necessary to confirm the diagnosis of Norwegian scabies, especially when the clinical presentation is ambiguous or other conditions are suspected. Skin biopsy involves removing a small sample of skin tissue for histopathological examination. Mites can be visualized within the epidermis or dermis on histopathological examination. Scabies eggs can also be seen within the epidermis. Scabies infestation can cause a variety of inflammatory changes in the skin, including spongiosis (intercellular edema), exocytosis (migration of inflammatory cells into the epidermis), and eosinophilic infiltration. Skin biopsy can be particularly helpful in differentiating Norwegian scabies from other skin disorders with similar clinical presentations, such as psoriasis or eczema. Molecular diagnostic techniques, such as polymerase chain reaction (PCR), are emerging as valuable tools for the detection of *Sarcoptes scabiei* DNA in skin samples. PCR offers high sensitivity and specificity, particularly in cases with low mite burden or atypical presentations. PCR involves amplifying specific DNA sequences from the *Sarcoptes scabiei* mite, allowing for its detection even in the absence of visible mites, eggs, or scybala. PCR can be performed on skin scrapings, skin biopsies, or even environmental samples, such as bedding or clothing. While PCR is a promising advance in the diagnosis of Norwegian scabies, its availability and accessibility may be limited in certain settings. Further research is needed to evaluate the clinical utility and cost-effectiveness of PCR in the diagnosis of scabies.[11,12]

Scabies, a highly contagious skin infestation caused by the *Sarcoptes scabiei* mite, poses a significant threat to maternal and neonatal health. The transmission of scabies from mother to infant is a particular concern, especially in cases of Norwegian scabies, where the mite burden is exceptionally high. This heightened risk stems from the intimate contact between mother and infant during pregnancy, childbirth, and breastfeeding, providing ample opportunities for mite transmission. Although rare, scabies mites have been detected in the placenta and umbilical cord, suggesting the possibility of transplacental transmission. The close contact between mother and infant during labor and delivery can facilitate the transfer of mites from the mother's skin to the infant's skin. After birth, continued skin-to-skin contact during breastfeeding, cuddling, and co-sleeping can lead to scabies transmission. The presence of active scabies infestation in the mother is the most significant risk factor for neonatal scabies. Norwegian scabies, with its exceptionally high mite burden, poses a greater risk of transmission compared to classic scabies. Premature infants have thinner and more delicate skin, making them more susceptible to scabies infestation. Infants with weakened immune systems, such as those with HIV or other immunodeficiency disorders, are at increased risk of severe scabies infestations. Living in overcrowded conditions increases the risk of scabies transmission within families and communities. Inadequate hygiene practices, such as infrequent bathing and sharing of personal items, can contribute to the spread of scabies. The rash may be widespread, involving the face, scalp, palms, and soles, unlike classic scabies,

which typically spares these areas. Blisters and pustules are more common in neonatal scabies than in classic scabies. Infants with scabies may be irritable and restless due to the intense itching. Scabies can interfere with feeding and sleep, leading to poor weight gain and failure to thrive. Scratching can break the skin, increasing the risk of secondary bacterial infections, such as impetigo or cellulitis. The diagnosis of neonatal scabies can be challenging, as the clinical presentation may be atypical and mimic other skin disorders. Skin scrapings and microscopic examination are essential for confirming the diagnosis.

The treatment of neonatal scabies should be initiated promptly to prevent complications and limit transmission. Topical scabicides, such as permethrin 5% cream, are the mainstay of treatment. The medication should be applied to the entire body, including the face and scalp, and left on for the recommended duration. In addition to topical treatment, meticulous hygiene practices are crucial in managing neonatal scabies. This includes frequent bathing, laundering of clothing and bedding, and cleaning of living spaces. Close contacts of the infant should also be treated prophylactically to prevent re-infestation. Preventing scabies transmission from mother to infant is paramount. Pregnant women with suspected scabies should be screened and treated promptly to prevent transmission to their newborns. Healthcare providers should educate pregnant women and their families about scabies, its transmission, and prevention strategies. Emphasize the importance of good hygiene practices, such as frequent handwashing and avoiding sharing of personal items. Encourage measures to control the spread of scabies in the home, such as laundering of bedding and cleaning of living spaces.[13,14]

Scabies, a highly contagious skin infestation caused by the *Sarcoptes scabiei* mite, disproportionately affects individuals and communities burdened by socioeconomic disadvantage. Poverty, overcrowding, and limited access to healthcare and education create a fertile ground for the spread of scabies, hindering its timely diagnosis and treatment, and perpetuating a cycle of health disparities. Poverty, a complex and multifaceted phenomenon, encompasses not only a lack of financial resources but also limited access to education, housing, sanitation, and healthcare. These interconnected factors create a web of disadvantage that increases vulnerability to scabies and other infectious diseases. Poverty often forces individuals and families to live in overcrowded and unsanitary conditions, where scabies can spread rapidly. Shared living spaces, limited access to clean water and sanitation facilities, and inadequate ventilation contribute to the transmission and persistence of scabies infestations. Poverty can lead to malnutrition, which compromises immune function and increases susceptibility to infections, including scabies. Malnourished individuals may also have impaired wound healing, making them more prone to secondary infections from scratching. Poverty can limit access to healthcare, hindering early diagnosis and treatment of scabies. Individuals may delay seeking medical attention due to financial constraints, lack of transportation, or fear of stigmatization. This delay can allow the infestation to progress and become more challenging to treat. Poverty can limit access to education, hindering awareness and understanding of scabies, its transmission, and prevention strategies. Individuals with limited education may be less likely to recognize the signs and symptoms of scabies or seek appropriate medical care. Overcrowding, a common consequence of poverty and urbanization, facilitates the rapid spread of scabies within families, communities, and institutions. Close physical contact in overcrowded settings provides ample opportunities for mite transmission, increasing the risk of outbreaks and perpetuating the cycle of infestation. Scabies is often transmitted within households, where close contact among family members is unavoidable. Overcrowded living conditions increase the likelihood of mite transfer through shared bedding, clothing, and personal items. Overcrowding in schools, daycare centers, and other community settings can also contribute to the spread of scabies. Children are

particularly vulnerable due to their close interactions and tendency to share personal belongings. Outbreaks of scabies are common in institutional settings, such as nursing homes, prisons, and refugee camps, where overcrowding and limited hygiene resources can facilitate rapid transmission. Limited access to healthcare is a major obstacle to the timely diagnosis and treatment of scabies, particularly in resource-poor settings. Financial constraints, lack of transportation, and inadequate healthcare infrastructure can hinder individuals from seeking medical attention, allowing scabies infestations to persist and spread. The cost of healthcare, including consultations, medications, and diagnostic tests, can be prohibitive for individuals living in poverty. Even in countries with universal healthcare coverage, out-of-pocket expenses for transportation, childcare, and lost wages can create significant financial barriers to accessing care. In rural or remote areas, access to healthcare facilities may be limited, requiring individuals to travel long distances to seek medical attention. This can be particularly challenging for those with limited transportation options or mobility impairments. Cultural beliefs and practices can also influence healthcare-seeking behavior. In some communities, scabies may be stigmatized or attributed to supernatural causes, leading to delays in seeking medical care. Lack of education can perpetuate misunderstanding and misinformation about scabies, hindering its prevention and control. Individuals with limited education may be less likely to recognize the signs and symptoms of scabies, understand its mode of transmission, or seek appropriate medical care. Health literacy, the ability to understand and act on health information, is essential for preventing and managing scabies. Individuals with low health literacy may have difficulty understanding medical instructions, interpreting medication labels, or following hygiene recommendations. Scabies is often associated with stigma and misconceptions, particularly in communities with limited education. These misconceptions can lead to discrimination, social isolation, and delays in seeking treatment. In some cultures, traditional practices, such as sharing of personal items or using herbal remedies, may inadvertently contribute to the spread of scabies. Education about safe and effective scabies prevention and treatment practices is crucial in these communities. The case of Mrs. M and her infant, By. P, illustrates the complex interplay of socioeconomic factors and health disparities in the context of scabies infestation. The family's socioeconomic circumstances, including their living conditions and lack of prenatal care, likely contributed to the development and severity of the scabies infestation. Mrs. M's lack of prenatal care may have prevented early detection and treatment of her scabies, allowing it to progress and spread to her infant. The family's living conditions, characterized by overcrowding and limited hygiene resources, likely facilitated the transmission and persistence of the infestation.[15,16]

Norwegian scabies, a severe form of scabies infestation, requires a comprehensive and multifaceted treatment approach to effectively eradicate the mites, alleviate symptoms, and prevent complications. The mainstay of treatment involves the use of topical and systemic scabicides, coupled with meticulous hygiene practices and environmental control measures. Topical scabicides are the cornerstone of Norwegian scabies treatment. These medications work by directly killing the *Sarcoptes scabiei* mites and their eggs, disrupting their life cycle and reducing the mite burden. Permethrin, a synthetic pyrethroid, is the most commonly used topical scabicide. It is highly effective against scabies mites and has a good safety profile. Permethrin is typically applied to the entire body from the neck down, left on for 8-14 hours, and then washed off. A repeat application may be necessary after one week to ensure complete eradication of the mites. Ivermectin, an antiparasitic medication, is also available in a topical formulation for the treatment of scabies. It is as effective as permethrin and may be preferred in certain cases, such as in patients with permethrin allergy or resistance. Ivermectin cream is typically applied to the entire body from the neck down, left on for 12 hours,

and then washed off. Other topical agents that may be used in the treatment of Norwegian scabies include crotamiton, lindane, and sulfur. However, these agents are less commonly used due to their lower efficacy, potential for side effects, or inconvenience of application. In severe cases of Norwegian scabies or in patients who cannot tolerate topical treatment, oral ivermectin may be used as an adjunctive therapy. Ivermectin is a broad-spectrum antiparasitic medication that is highly effective against scabies mites. It is typically administered as a single oral dose, repeated after one to two weeks. Ivermectin is generally safe and well-tolerated, but it may cause mild side effects such as nausea, vomiting, dizziness, and headache. Ivermectin is contraindicated in pregnant or breastfeeding women and in children weighing less than 15 kg. Meticulous hygiene practices are essential in preventing the spread of scabies and preventing re-infestation. Bathing with soap and water helps to remove mites, eggs, and scybala from the skin. All clothing, bedding, and towels used by the infected individual should be washed in hot water (at least 60°C) and dried in a hot dryer. Items that cannot be washed should be dry-cleaned or sealed in plastic bags for at least 72 hours. Vacuuming or cleaning living spaces, including furniture, carpets, and floors, helps to remove mites and prevent their spread. Encourage frequent handwashing and discourage sharing of personal items, such as towels, combs, and bedding. Environmental control measures are also important in preventing the spread of scabies and preventing re-infestation. Infected individuals should be isolated from others as much as possible to prevent transmission. Disinfecting surfaces and objects that may have come into contact with the infected individual can help to reduce the risk of transmission. Educating patients, families, and healthcare providers about scabies, its transmission, and prevention strategies is crucial in controlling the spread of the infestation. In the case of Mrs. M and her infant, By. P, a comprehensive treatment approach was employed to effectively manage their Norwegian scabies infestation. Both mother and infant received topical permethrin 5% cream, which is the mainstay of treatment for scabies. The family also received extensive education on hygiene practices and environmental control measures to prevent re-infestation and transmission to others.[17,18]

Norwegian scabies, although a rare variant of scabies infestation, presents a significant public health challenge due to its unique characteristics and potential for rapid dissemination. The condition is characterized by an exceptionally high mite burden, often exceeding millions of mites on a single individual, making it highly contagious and capable of causing outbreaks in various settings. The hyperinfestation of mites in Norwegian scabies facilitates its rapid spread through both direct and indirect contact. Direct skin-to-skin contact with an infected individual is the most common mode of transmission. However, indirect contact with contaminated objects, such as bedding, clothing, and furniture, can also transmit the mites. The mites can survive for several days off the host, increasing the risk of transmission through fomites. This prolonged survival, coupled with the sheer number of mites present in Norwegian scabies, makes it particularly challenging to control outbreaks in settings where close contact is unavoidable, such as healthcare facilities, nursing homes, and other institutional settings. Outbreaks of Norwegian scabies have been reported in various healthcare and institutional settings, highlighting the vulnerability of certain populations to this highly contagious condition. Individuals with weakened immune systems, such as those with HIV/AIDS, organ transplantation, or undergoing chemotherapy, are at increased risk of developing Norwegian scabies and experiencing severe complications. Elderly individuals, particularly those residing in nursing homes or long-term care facilities, are also at high risk due to their age-related decline in immune function and potential for underlying medical conditions. Overcrowding and limited hygiene resources in these settings can further exacerbate the risk of outbreaks. Prompt identification and treatment of Norwegian scabies cases are crucial in controlling outbreaks and

preventing further spread. Public health measures play a vital role in achieving this goal, encompassing surveillance, case management, contact tracing, and education. Active surveillance systems are essential for monitoring the occurrence of Norwegian scabies cases and identifying potential outbreaks. Healthcare providers should be vigilant in recognizing and reporting suspected cases of Norwegian scabies to public health authorities. Data collection and analysis can help identify risk factors, trends, and high-risk populations, informing targeted interventions. Prompt and effective treatment of Norwegian scabies cases is crucial to reduce mite burden and prevent transmission. Topical scabicides, such as permethrin 5% cream, are the mainstay of treatment. Oral ivermectin may be used as an adjunct in severe cases or in those who cannot tolerate topical treatment. Meticulous hygiene practices and environmental control measures are essential in preventing re-infestation and transmission to others. Identifying and treating close contacts of Norwegian scabies cases is crucial in preventing further spread. Contact tracing involves interviewing the infected individual to identify individuals who may have been exposed to scabies. Close contacts should be offered prophylactic treatment, even if they are asymptomatic, to prevent the development of scabies. Educating healthcare providers, patients, families, and the public about Norwegian scabies is essential in raising awareness and promoting prevention and control measures. Educational materials should cover the signs and symptoms of scabies, modes of transmission, risk factors, and treatment options. Emphasis should be placed on the importance of early diagnosis, prompt treatment, and meticulous hygiene practices.[19,20]

4. Conclusion

This case of Norwegian scabies in a mother-infant dyad underscores the critical need for early diagnosis and treatment of this highly contagious condition, especially in vulnerable populations. The delayed diagnosis in the mother and subsequent transmission to her infant highlight the importance of a high index of suspicion for Norwegian scabies, even in individuals without obvious risk factors. The infant's malnutrition further complicated the clinical picture, emphasizing the need for comprehensive care, including nutritional support and social assistance. This case also demonstrates the importance of patient education and environmental control measures in preventing the spread of Norwegian scabies and ensuring successful treatment outcomes. Healthcare providers should be vigilant in recognizing and reporting suspected cases of Norwegian scabies to public health authorities. Public health education campaigns should aim to destigmatize scabies and promote awareness and understanding of the condition. Expanding access to affordable and quality healthcare services is crucial in addressing health disparities and ensuring timely diagnosis and treatment of scabies, particularly in underserved communities.

5. References

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