

## Treatment and prevention of a hospital based infection caused by crusted scabies: A rare variant of scabies

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### ABSTRACT

**Objective:** The purpose is to report a rare variant of scabies known as Norwegian or crusted scabies which was the source of an outbreak of scabies in the hospital and highlight the preventive and treatment aspects by which the infection was controlled.

**Materials and Methods:** All staff members who were in contact with the patient with complaints of itching were screened. Diagnosis was made by the typical history and examination of all the affected staff members and also the family members. All affected contacts were treated with anti-scabetic treatments. Information leaflets highlighting the importance of containing the infection by preventive measures were distributed to the staff.

**Results:** All patients responded well to treatment. Because all staff members followed the preventative advice the infection was controlled without spreading it to their contacts.

**Conclusion:** A rare variant of scabies was the cause of a nosocomial infection causing distress to the affected staff members and financial implications, as the hospital had to bear the cost of the expensive anti-scabetic preparations. Prompt treatment and appropriate preventative advice and care contained this rare parasitic nosocomial infection.

**Key words:** hospital based infection, crusted scabies, prevention, treatment

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### INTRODUCTION

First described by Boeck and Danielssen among patients with lepromatous leprosy in Norway in 1848, crusted scabies is also known as Norwegian scabies<sup>1</sup>. The disease derives its name from the appearance of the widespread hyperkeratotic skin lesions which harbor innumerable itch mites.

The causative agent is the scabies mite, *Sarcoptes scabiei* var. *hominis*, an obligate parasite that lives in burrowed tunnels in the stratum corneum, the top most layer of the skin. The average number of mites infesting a normal immune competent adult is about ten to eleven, but in crusted scabies the suppressed immune response of the affected patient facilitates uncontrolled proliferation making the mite count innumerable<sup>2</sup>.

Typical clinical manifestations of classical scabies such as nocturnal itching, papules and burrows in flexural spaces may not be present in crusted

scabies, the reason why the diagnosis maybe missed initially. The clinical features of crusted scabies may also vary according to the severity of involvement and the extent of immunosuppression<sup>3</sup>. We report a patient who was admitted for chronic renal failure with crusted scabies, the source of a hospital-based infection.

### MATERIALS AND METHODS

A 65 year old male was admitted for the treatment of chronic renal failure. He was first seen in the emergency ward after which he was transferred to the Intensive Care Unit for the complications of chronic renal failure. Subsequently he was transferred to the Medical ward for hemodialysis. His hospital stay was for a two week period during which time he was referred to the Dermatology department for complaints of chronic dermatoses. Examination of the skin revealed generalized xerosis with a few areas of hyperkeratosis in the back (Figure 1).

Table 1. Index case and the no of contacts

INDEX CASE	CONTACTS( 11)			NO OF FAMILY MEMBERS AFFECTED(3)		
	NO OF HOSPITAL STAFF AFFECTED ( 8)					
M,67, chronic renal failure with crusted scabies	Physician	Emergency ward staff	ICU staff	Male medical ward staff	wife	children
1	1	2	2	3	1	2

With history of itching among family members a diagnosis of scabies was made and the patient was treated with anti-scabietics. Subsequently the nursing staff who had cared for the patient and the attending physician also reported itchy dermatoses. The diagnosis was modified to that of crusted scabies and all staff and family members who were in contact with the patient were examined and treated with anti-scabietics. Treatment consisted of topical anti-scabietic, permethrin and antihistamines. Preventive advice was also given in the form of patient information leaflets in order to contain the infection and prevent further tertiary spread from the affected members to their contacts. (Table 1)

## DISCUSSION

Crusted scabies is highly contagious with the predominant route of transmission being skin-to-skin contact. Fomites have also been cited as a cause of transmission in crusted scabies<sup>4</sup>. The immediate environment of a patient with crusted scabies is heavily infected with mites. Patients with crusted scabies are capable of triggering an epidemic of scabies<sup>5</sup>.

Classical scabies is diagnosed by generalized itching, nocturnal itching and the presence of papules and burrows in flexural surfaces. The skin manifestations of scabies are thought to be due to the immune response triggered by the burrowing of the female mite in the stratum corneum and stratum Malpighi, the superficial layers of the skin<sup>6</sup>.

A healthy adult with an intact immune system combined with scratching, keeps



Figure 1. Generalised xerosis and hyperkeratosis

the mite load in check, but still requires scabicial treatment as the mites may not be eliminated completely. In patients with reduced immune competency who are affected by scabies, the mites proliferate innumerable and cause crusted scabies. The probable causes for the development of crusted scabies is a defective T-cell immune response, or a diminished cutaneous sensation and a reduced ability to effectively debride the mites by scratching<sup>3</sup>. Some immune compromised states which predispose to crusted scabies are AIDS, T cell leukemia, critical illnesses and mental debilitatory disorders such as dementias and retardation<sup>4</sup>.

The cutaneous manifestations of crusted scabies are hyperkerotic plaques which are present over the extensor surfaces or a generalized psoriasis from dermatitis-like appearance. Rarely the entire skin can be involved giving rise to erythroderma. Clinical manifestations may be varied proportionate to the degree of immunosuppression<sup>5</sup>.

Scabies is diagnosed by the clinical features and demonstration of the mite from skin scrapings using light microscopy, epiluminescence microscopy or dermoscopy<sup>7-8</sup>. Since unrecognized scabies is often the source of institutional outbreaks, it is imperative to examine the skin for the presence of *Sarcoptes scabiei* in any patient who is moribund or debilitated with crusted skin lesions<sup>4</sup>. Our patient who was admitted for chronic renal failure was a debilitated patient who had generalized xerosis, usually seen in uremia and not suggestive of typical scabies. The presence of itching among contact hospital staff alerted us to the possibility of crusted scabies. Prompt diagnosis and effective treatment and preventative advice to the contacts helped to contain the infection. The patient expired in the ward due to medical complications. All the bed clothes, covers and sheets and mattress were discarded with instructions for incineration.

The Centre for Disease Control and prevention (CDC) advises the following measures to control an institutional outbreak of crusted scabies<sup>9</sup>.

- Rapid and aggressive detection, diagnosis, infection control, and treatment measures because this form of scabies is highly transmissible.
- An institution-wide information program should be implemented to instruct all management, medical, nursing and support staff about scabies, the scabies mite, and how scabies is and is not spread.
- All staff, volunteers, and visitors who may have been exposed to a patient with crusted scabies or to clothing, bedding, or furniture used by such a patient, should be identified and treated.
- All suspected and confirmed cases, as well as all potentially exposed patients, staff, visitors and family members should be treated at the same time to prevent reexposure.
- Persons with crusted scabies generally require treatment at least twice, a week apart. Topical treatment with permethrin or oral treatment with ivermectin, is advised although ivermectin is currently not FDA-approved for treatment of scabies.

All these measures were implemented to whatever extent was possible. Oral ivermectin was not available and so only topical permethrin was prescribed. Patient information leaflets were distributed to all the contacts and staff members in the ward. Contacts reported for examination and treatment after the distribution of the patient information leaflets. Such contacts were treated for a period of two weeks even after the patient expired. After this period no single case was reported.

## CONCLUSION

A rare case of crusted scabies was the cause of a hospital-based infection. In a hospital setting health care workers who

have the most patient contact are at the highest risk of acquiring scabies. Prompt identification and treatment of patient and contacts contained the outbreak in the hospital, which could have reached epidemic proportions had it not been recognized or treated.

#### REFERENCES

1. Danielsen DG, Boeck W. Treatment of Leprosy or Greek Elephantiasis. Paris: JB Balliere;1848.
2. Mellanby K. Biology of the parasite. In: Scabies and Pediculosis. Orkin M, Maibach HI, Parish LC, Schwartzman RM Eds. Philadelphia: Lippincott;1977:9-16.
3. Walton SF, Beroukas D, Roberts-Thomson P, et al.. New insights into disease pathogenesis in crusted (Norwegian) scabies: The skin immune response in crusted scabies. *Br J Dermatol* 2008;158:1247-55.
4. Karthikeyan K. Crusted scabies. *Indian J DermatolVenereolLeprol* 2009;75:340-7.
5. Roberts LJ, Huffam SE, Walton SF, et al. Crusted scabies: Clinical and immunological findings in seventy-eight patients and a review of the literature. *J Infect* 2005;50:375-81.
6. Alexander JOD. Arthropods and skin. Berlin: Springer-Verlag;1984:50-5.
7. Haas Nand Sterry W. The use of ELM to monitor the success of anti-scabietic treatment. Epiluminescence light microscopy. *Arch Dermatol* 2001;137:1656-7.
8. Micali G, Lacarrubba F, Tedeschi A. Videodermatoscopy enhances the ability to monitor efficacy of scabies treatment and allows optimal timing of drug application. *J EurAcadDermatolVenereol* 2004;18:153-4.
9. Centers for Disease Control and Prevention. Atlanta, USA: 2010. Available from: URL: [www.cdc.gov/parasites/scabies/health\\_professionals/crusted.html](http://www.cdc.gov/parasites/scabies/health_professionals/crusted.html).