



# A Retrospective Study of Scabietic Medical Workers Exposed to a Norwegian Scabies Patient

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## Abstract

**Objectives:** Scabies is one of the commonest skin disorders in developing world especially in poor, overcrowded tropical areas. The purpose of our study is to provide data of scabietic patients who works in Vajira hospital and had direct contact with Norwegian scabies patient as well as review of the current update on diagnosis and management of scabies.

**Methods:** We retrospectively reviewed the data of 38 patients who had been exposed to the same Norwegian scabies patient in Vajira hospital and came to Dermatology Unit. The statistical analysis was made by using descriptive statistical analysis. Visual analog scale was used for grading of pruritus.

**Results:** Of 38 patients reviewed, 25 were females. All of the patients were coming with pruritus which manifested prominently as nocturnal pruritus. The majority of the effected medical workers were the nurse (68%). Papular lesions with or without excoriation were commonly seen and eight patients were affected by secondary bacterial infection. Visual analog scale at score eight out of ten was most commonly found.

**Conclusion:** We did report the data of 38 medical workers who had been exposed to crusted scabies patient and were diagnosed as scabies. Nurse was the majority type of workers that was affected. Pruritus was found in all of the patients. The most common type of skin lesions was papules with or without excoriation. The visual analog scale of pruritic symptom in most of our patients was eight out of ten. Treatment for our patients was mainly the combination of oral Ivermectin and topical Benzyl benzoate. No report of reinfection in our patients.

**Keywords:** Medical workers, Norwegian scabies



# การศึกษาโรคหิดย้อนหลังของบุคลากรทางการแพทย์ ในวชิรพยาบาลที่สัมผัสผู้ป่วยโรคหิดชนิดสะเก็ดทั่วตัว

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## Abstract

**วัตถุประสงค์:** โรคหิดเป็นหนึ่งในโรคติดเชื้อผิวหนังที่พบบ่อยในประเทศที่กำลังพัฒนา โดยเฉพาะอย่างยิ่งในชุมชนที่มีความยากจน โดยการศึกษาครั้งนี้เพื่อให้ข้อมูลเกี่ยวกับผู้ป่วยโรคหิดซึ่งเป็นบุคลากรทางการแพทย์ใน วชิรพยาบาล ที่สัมผัสผู้ป่วยโรคหิดชนิดสะเก็ดทั่วตัวและเป็นการทบทวนวรรณกรรมเกี่ยวกับการวินิจฉัยและการรักษาโรคหิดในปัจจุบัน

**วิธีการดำเนินการวิจัย:** ทำการเก็บข้อมูลย้อนหลังของกลุ่มศึกษาคือบุคลากรในวชิรพยาบาลจำนวน 38 คน ที่สัมผัสผู้ป่วยโรคหิดชนิดสะเก็ดทั่วตัวคนเดียวกันและมาตรวจที่หน่วยโรคผิวหนัง วชิรพยาบาล โดยเป็นการวิจัยแบบพรรณนา และอาการคันของผู้ป่วยถูกประเมินโดยใช้มาตรวัดความเจ็บปวดด้วยการเปรียบเทียบกับด้วยสายตา

**ผลการวิจัย:** ผู้ป่วยทั้งหมด 38 ราย ได้เข้าร่วมการศึกษา เป็นหญิง 25 ราย และเป็นชาย 13 ราย ผู้ป่วยทุกรายมาพบแพทย์ด้วยอาการคัน โดยเฉพาะอย่างยิ่งอาการคันในเวลากลางคืน บุคลากรทางการแพทย์ที่ได้รับผลกระทบมากที่สุดคือพยาบาล ลักษณะทางคลินิกที่พบได้มากที่สุดของผู้ป่วยคือตุ่มคันทางผิวหนังแบบที่มีและไม่มีรอยเกาไปด้วย ผู้ป่วยจำนวน 8 รายพบการติดเชื้อแบคทีเรียซ้ำซ้อนร่วมด้วย อาการคันของผู้ป่วยที่ได้รับการประเมินโดยใช้มาตรวัดความเจ็บปวดด้วยการเปรียบเทียบกับด้วยสายตาที่ระดับ 8 พบได้มากที่สุด

**สรุป:** ทำการรายงานผลการศึกษาข้อมูลบุคลากรทางการแพทย์จำนวน 38 ราย ที่สัมผัสกับผู้ป่วยโรคหิดชนิดสะเก็ดทั่วตัวและได้รับการวินิจฉัยว่าเป็นโรคหิด บุคลากรทางการแพทย์ที่ได้รับผลกระทบมากที่สุดคือพยาบาล ลักษณะทางคลินิกที่พบได้มากที่สุดของผู้ป่วยคือตุ่มคันทางผิวหนังแบบที่มีและไม่มีรอยเกาไปด้วย อาการคันของผู้ป่วยที่ได้รับการประเมินโดยใช้มาตรวัดความเจ็บปวดด้วยการเปรียบเทียบกับด้วยสายตาที่ระดับ 8 พบได้มากที่สุด การรักษาหลักที่ได้ให้กับผู้ป่วยคือ การให้ยา benzyl benzoate ชนิดทา และยาขับพยาธิ ivermectin ไม่มีรายงานถึงการพบผู้ป่วยติดเชื้อซ้ำซ้อนในการศึกษาครั้งนี้

## Introduction

Scabies is a common public health problem which is caused by the mite, *Sarcoptes scabiei var hominis*. The microscopic mite burrows into the epidermis and lays eggs. Shortly thereafter, the host will develop an immune response leading to pruritus.<sup>1</sup> However, many studies reported that scabies impacted quality of life of patients beyond pruritus such as sleep disturbance and social stigmata from their skin lesions.<sup>2</sup> In addition to direct impact on quality of life, scabies can cause numbers of complications. Most of them are bacterial skin infections on excoriated skin which resulted from the consequence of pruritus. Long term consequences such as post streptococcal glomerulonephritis (PSGN) and rheumatic fever could occur and lead to morbidity in some of these patients.<sup>3</sup> Current diagnosis of scabies relies on their clinical grounds such as pathognomonic burrows on the finger web space. Microscopic skin scraping and adhesive skin tape test could be useful in patients with presumptive diagnosis of scabies.<sup>4</sup> The purpose of our study is to review data of 38 patients with scabies who works in Vajira hospital and had been exposed to Norwegian scabies patient. Additionally, the review and discussion of current diagnosis and updated treatment of scabies in developing world are provided.

## Methods

This study was approved by Vajira hospital Institutional Review Board. We retrospectively reviewed the data of 38 patients who had been exposed to the same Norwegian scabies patient in Vajira hospital and came to Dermatology Unit. The diagnosis of scabies was made on their clinical history, physical examinations and laboratory diagnosis by dermatologists. The statistical analysis was made by using descriptive statistical analysis. Visual analog scale was used for grading of pruritus.

## Results

Of 38 patients reviewed, 25 were females and the rest were males. All of the patients were coming with pruritus which featured prominently as nocturnal pruritus. Table 1 shows demographic data of the studied patients. The majority of the affected medical workers were nurse (68%). Surprisingly, none of the medical students was affected. Table 2 shows clinical characteristics of our 38 patients as well as their complications. Papular lesions with or without excoriation were commonly seen and eight patients were affected by secondary bacterial infection. Figure 1 shows the summary of visual analog scale of pruritus in our patients. Visual analog scale at score eight out of ten was most commonly found. All of our patients had received both topical benzyl benzoate and oral ivermectin. Although one pregnant nurse did receive 6% sulfur solution, there was no report of reinfection in our patients.

## Discussion

Scabies is one of the most common skin conditions. Its prevalence rates are as high as 40% in some communities.<sup>5</sup> Although it is a common disease especially in resource-limited countries, misdiagnosis is often seen. Therefore, scabies is a challenge disease to diagnose. Scabies itself can mimic a wide range of infectious and non-infectious diseases, and often masked clinical by super infection.<sup>6</sup> However, crusted scabies case known as “Norwegian scabies” is characterized by its hyperkeratotic skin crust and fissuring. Crusted scabies is usually affected by a non-protective host immune response. Unlike ordinary scabies, it can be affected by more than 4,000 mites per gram of skin whereas only less than 20 mites on the host skin of ordinary scabies. Therefore, patients with crusted scabies may act as core transmitters and possibly as a reinfection sources.<sup>7</sup>

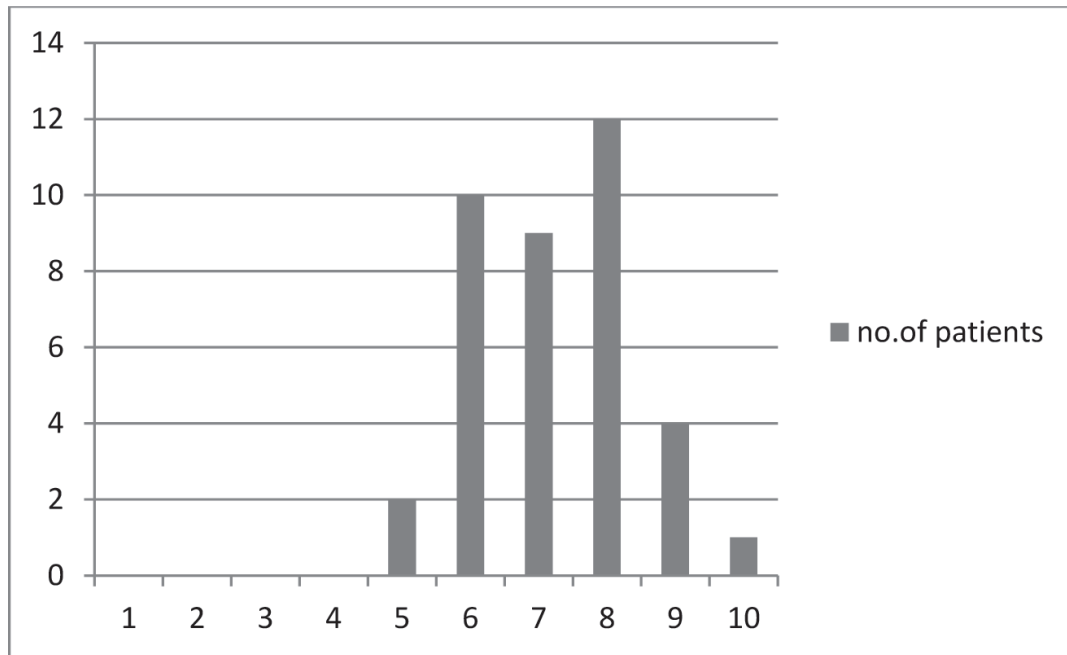


Figure 1: The summary of visual analog scale in pruritus in our patients (N=38)

Table 1:

Demographic data of study patients

Sex	N=38	%
Male	13	34
Female	24	63
Female with pregnancy	1	3
<b>Type of medical workers</b>		
Medical staff/fellow	2	5
Resident	1	3
Medical student	0	0
Nurse	26	68
Nursing student	0	0
Worker	4	10
Pharmacist	1	3
Physical therapist	4	10

Table 2:

Clinical characteristics of patients categorized by type of lesion<sup>(a)</sup>

Type of lesion	N
Papule	32
Nodule	7
Vesicle	5
Excoriation	24
Superimposed infection <sup>(b)</sup>	8

a = multiple classification was possible

b = pustule, super infection or abscess

To our knowledge, there were no study about the scabies in health care worker who has exposed to crusted scabies. Although, locations for outbreak of scabies are places like day-care centers, school and orphanages. However, a misdiagnosis of crusted scabies in a hospital can be one of outbreak locations.

Recently, there was a large study of scabies conducted in Thailand by Tantikosol et al. They reported that of 126 patients enrolled. They had a peak incidence of subjects in children. The pruritic papules were the most common sign and the main infected site was finger web space which is similar to our study.<sup>8</sup> However, our study had no child recruited as a subject. Another study by Pruksachatkunakorn et al. reported the emerge of scabies outbreaks in the orphanages in Chiang Mai which they use sulfur as a mass treatment of choice for the control of their outbreak.<sup>9</sup>

Because of their contagious activities and their size of 0.3x0.5 mm. Their visibility is almost always limited. The sarcoptes mites usually live in upper stratum corneum. Previous report suggested that the diagnosis in resource-limited setting were usually made by a case definition or by clinical. Because scabies can mimic a variety of skin diseases

and the characteristic nocturnal pruritus is unspecified, a diagnosis based on clinical criteria alone is prone to error.<sup>6</sup> Walter et al. proposed that the adhesive test tape technique was better than microscopic examination technique for screening purpose because it had higher positive and negative predictive value and is easy to perform.<sup>4</sup> Nevertheless, our study recruited subjects by both microscopic examination technique and adhesive test tape but not include burrow ink test because they are inconstantly present and usually obliterated by scratching by the patients. We do not recommend using only clinical findings considered to be diagnostic because its diagnostic accuracy is usually not known.

For decades, the treatment of individual patients with scabies remains challenging. Although oral ivermectin is being increasingly used, the main treatment still entails the application of topical acaricide such as 8-10% sulfur, 10-25% benzyl benzoate, 1% lindane, 10% crotamiton, 5% permethrin or 0.5% malathion. Despite there are many choices of drug, the usage depends on their local availability, side effects, cost and practitioner's preference.<sup>10</sup>

## Oral ivermectin

Ivermectin is the main oral agent used in scabies. It is a derivative of the avermectins (groups of macrocyclic lactones with broad-spectrum antiparasitic effects). Most commonly, it is administered at a weight-based dose of 200 mg/kg. The principal indication for oral ivermectin therapy has been for the treatment of crusted scabies. Moreover, ivermectin has been used in mass treatment setting and used for control of institutional outbreaks in which topical treatment is less practical.<sup>5</sup> A previous study reported that one dose of the oral agents has been found to be less effective than an application of 5% permethrin cream;<sup>11</sup> However, another study reported that by using a two-dose regimen of ivermectin can give a cure rate of more than 90%.<sup>12,13</sup> The recommendation of the second dose in ordinary scabies is to administer within 2-week period to reach its ovicidal activity.

In patients with crusted scabies, because of their acting as core transmitters and reservoirs of infection, three to seven doses of ivermectin are recommended as well as use along with topical scabicides and keratolytic agents.

Unfortunately, ivermectin has its own concern about central nervous system toxicities. A previous controversial study did report increasing neurotoxicity in elderly when treated with ivermectin for a scabies outbreak. In addition, ivermectin is not currently recommended for use in pregnant women or children under the age of five.<sup>14</sup> Another concern is that when using ivermectin in patients with concomitant filarial infection, it has been reported to cause adverse effects such as fever, myalgia, malaise and postural hypotension due to release of filarial antigen by ivermectin. Therefore, ivermectin should be aware when use in these groups of patients.<sup>15</sup>

## Topical agents

There are many types of topical agents to apply for scabicide. However, the topical 5% permethrin dermal cream is the gold standard treatment in much of Europe and the United States. It has the advantages of low toxicity and has both adulticidal and ovicidal activities. Moreover, permethrin can be used not only in children but also in pregnant women and it has been successfully used in a number of community-based.<sup>16</sup>

Benzyl benzoate, a cheaper medication although not available in the United States, is widely used in Africa, Asia and also in our study. The concentration is 25% used in adults and 12.5% in children. To date, there is no report of resistance in the 25% solution. Disadvantages of benzyl benzoate are that the drug always causes immediate skin irritation, burning and stinging effects. Treatment guideline recommended that benzyl benzoate should be left on for 24 hours and/or used on repeated consecutive doses.

Other topical agents such as 8-10% precipitated sulfur has wide margin of safety in infancy and pregnant women. However, the disadvantage is the profound odor and messy application.<sup>17</sup>

Our study had used oral ivermectin and benzyl benzoate as a treatment for scabies. Although one pregnancy nurse had to use 6% sulfur instead. We also found some of the subjects developed the rash and itch. Antihistamine can assist with these itching. Causes of treatment failure usually are from incorrect diagnosis, improper application of the topical agents, reinfestation from close contact especially in crusted patients. Rapid reinfestation is extremely common. Therefore, rigorous education about the need of contacts to be treated even asymptomatic will be key in a successful elimination program.

In conclusion, we did report the data of 38 medical workers who had been exposed to crusted scabies patient and were diagnosed as scabies. Nurse was the majority of type of workers that was affected. Pruritus was found in all of the patients. The most common type of skin lesions was papules with or without excoriation. The visual analog scale of pruritic symptom in most of our patients was eight out of ten. Treatment for our patients was mainly the combination of oral ivermectin and topical benzyl benzoate. However, there was no report of reinfection in our patients.

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