



ORIGINAL ARTICLE

Risk factors for scabies in Taiwan

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Background: Scabies is a global problem. Transmission of scabies is usually due to direct or indirect contact. Delay in diagnosis may result in the spread of the scabies mite. Prompt diagnosis and treatment are important.

Methods: In this study, we collected data from 52 scabies patients and analyzed the risk factors for scabies with the case-control method.

Results: Our study has revealed that the patients who were bedridden [odds ratio (OR) 6.72, $p < 0.0001$], living in a nursing home (OR 9.89, $p < 0.0001$), had a higher clinical severity status before admission (OR 1.25, $p < 0.0001$), and a catheter inserted (including nasogastric tube, Foley catheter, Port-A, or Hickman catheter) (OR 9.05, $p < 0.0001$) were significantly more likely to acquire scabies infection.

Conclusion: To prevent scabies, proper management of the nursing home setting, including adequate cleaning of the contaminated clothing, bedding and equipment, in combination with treating all suspected scabies patients, and contact isolation are important and necessary.

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Introduction

Scabies is an ectoparasitic infection which has the long troubled humanity. It is caused by the mite *Sarcoptes*

scabiei. Scabies occurs worldwide and its prevalence is estimated to be about 300 million cases yearly.¹ The classic manifestations of scabies include generalized itching which often becomes worse at night,² and abnormal skin lesions (papules, pustules, nodules, and occasionally urticaria).^{3,4} The skin lesions are often noted on wrists, finger webs, axillae, the periumbilical region, abdominal wall, genitals and buttocks.⁵ Complications and mortality may occur due

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to secondary bacterial infections.^{6–8} According to the literature, risk factors for scabies are war, overcrowding, malnutrition, sporadically sexual contact, and poor hygiene.^{9–11} There are also reports of scabies outbreaks in long-term care facilities, nursing homes, and hospitals.^{11–14} However, according to our knowledge, there is still no report concerning risk factors for scabies in Taiwan. Healthcare workers cannot ignore the patients infected with scabies who were not diagnosed on admission. We have performed a case-control study to identify the risk factors of acquiring scabies in Taiwan, with a view to aid early diagnosis and treatment.

Materials and methods

We reviewed the charts of adults admitted to our hospital with a diagnosis of scabies after admission from June 2007 to June 2010. Chang Gung Memorial Hospital at Keelung is a 1088-bed, tertiary-care, teaching hospital with approximately 50,000 admissions per year. The diagnosis of scabies was based on the presence of typical skin lesions (Figs. 1–3), discovery of scabies mites (Fig. 4), or dermatologist's consultation, along with a good response to antiscabies treatment. To treat scabies infection, we used 1% γ -benzenehexachloride (lindane) applied thoroughly on the skin from neck to soles and then repeated it once again one week later. In addition, we used crotamiton ointment topically on skin lesions two times a day for about 2 weeks till skin lesions subsided.

We enrolled 52 scabies case patients in this study and also selected 104 nonscabies control patients, each of whom was admitted to our hospital within 3 days of a scabies case-patient. Scabies case patients and nonscabies control patients were matched for age and sex. We collected the data of the case patients and control patients including the patient history, the interval between admission and the diagnosis of scabies, the duration of hospitalization, the usage of catheters (nasogastric tube, Foley catheter, Port-A, or Hickman catheter), the APACHE (Acute Physiology, Age, Chronic Health Evaluation) II score¹⁵ on admission, history of care in nursing homes, and factors causing bedridden status. Underlying diseases were also evaluated. Chronic steroid therapy was defined as using



Figure 2. Crusted plaques on the finger slit.

prednisone more than 10 mg per day over 7 days. Liver cirrhosis was diagnosed based on the finding of the abdominal ultrasound and blood examinations. The existence of rheumatologic diseases, including systemic lupus erythematosus and rheumatoid arthritis, are investigated in this study. The use of indwelling catheters including the nasogastric tube, Foley catheter, Port-A and Hickman catheter, are also recorded.

Descriptive statistics, such as means, standard deviation, frequency, and percentage, were determined. Chi-square test and Fisher's exact test were used to compare data between the two groups where appropriate. Logistic regression with forward selection was used to determine the days of hospitalization. Odds ratios (ORs) with 95% confidence interval (CI) were calculated to identify the risk factors of scabies. The p value < 0.05 was considered statistically significant.

Results

In this study, there were 52 scabies patients (24 males and 28 females) with a mean age of 79.1 years (range, 47–98 years) and 104 nonscabies patients (48 males and 56 female) with a mean age of 71.82 (range, 25–102 years). The clinical features of scabies patients and nonscabies patients are summarized in Table 1. Among the 52 patients with scabies infection, 41 patients (78.8%) had at least one



Figure 1. Crusted plaques on the palm.



Figure 3. Crusted plaques on the penis.

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