

# Dermatological conditions presenting at an emergency department in Singapore

Wang E, Lim B L, Than K Y

## ABSTRACT

**Introduction:** In Singapore, a significant proportion of patients receive specialist dermatological services via referrals from points of primary care, such as polyclinics and emergency departments (ED). The study hospital, Tan Tock Seng Hospital, is an acute care general hospital with a large catchment area, and has the busiest ED in Singapore. The aim of this paper was to describe the types of dermatological conditions presented at the ED in the year 2007. This information is useful for the future education of junior doctors working in the department, as well as for the allocation of future resources in the treatment of the more common conditions.

**Methods:** The ED patient database was searched for all dermatological conditions by ICD-9 code and by keywords in the diagnosis description. The two lists were merged and duplications were eliminated. The consultation notes of the patients were reviewed in cases where the diagnosis was ambiguous. Patient demographics were then filtered and analysed.

**Results:** A total of 4,061 patients were seen in the ED with a primary dermatological complaint, out of a total of 157,527 attendances in 2007. The commonest conditions seen were chickenpox and herpes zoster (20.8 percent). Dermatitis/eczema (11.6 percent) and urticaria (11.4 percent), nail conditions including trauma and infections (10.2 percent) and drug rashes (9.7 percent) were also common. Venereal diseases (1 percent) were uncommonly seen in the ED. Interestingly, men (65.3 percent) were seen in the ED for dermatological conditions twice as often as women (34.7 percent).

**Conclusion:** The recognition and management of the common conditions should be core modules in the training of doctors and nurses.

**Keywords:** chickenpox, dermatitis,

dermatological conditions, rash, skin conditions

*Singapore Med J 2009;50(9):881-884*

## INTRODUCTION

Dermatology is largely an outpatient-based specialty in Singapore, with the majority of patients attending specialist consultations at the National Skin Centre (NSC). Primary care is provided by general practitioners and emergency departments across the island, with referrals made to NSC or dermatology specialist departments when required. This initial presentation is often made to a doctor who may have had little or no prior dermatology training. The aim of this study was to review the presentations of dermatological conditions in a busy emergency department (ED) over the period of a year. This information will be useful in identifying common and important skin diseases that need to be recognised at the point of primary care, so that the proper initial treatment and referrals can be instituted.<sup>(1,2)</sup>

## METHODS

A search was made through the specialised database of the ED of Tan Tock Seng Hospital (TTSH) from January to December 2007. Primary diagnoses under the ICD-9 codes for skin diseases were included. Nail and hair disorders were included as appendages of the skin. A second search was conducted with keywords for diagnosis descriptions. Thus, two lists were generated: one according to the ICD-9 coding, and another according to the diagnosis recorded by the attending physician. The two lists were checked for discrepancies in order to minimise the number of patients which might be overlooked. A review of the consultation notes was made to confirm the diagnosis in cases where the primary diagnosis was ambiguous (e.g. when labelled as “rash” or “allergy” by the attending physician). The epidemiology and patient demographics were recorded. The domain specific review board exemption was obtained for this project, which is a retrospective descriptive project, without patient identifiers.

## RESULTS

There were 157,527 attendances to the TTSH ED in 2007; of these, 4,061 (2.6%) with primary dermatological problems were seen (Fig. 1). The commonest condition seen was chickenpox, comprising 15.5% of all dermatological

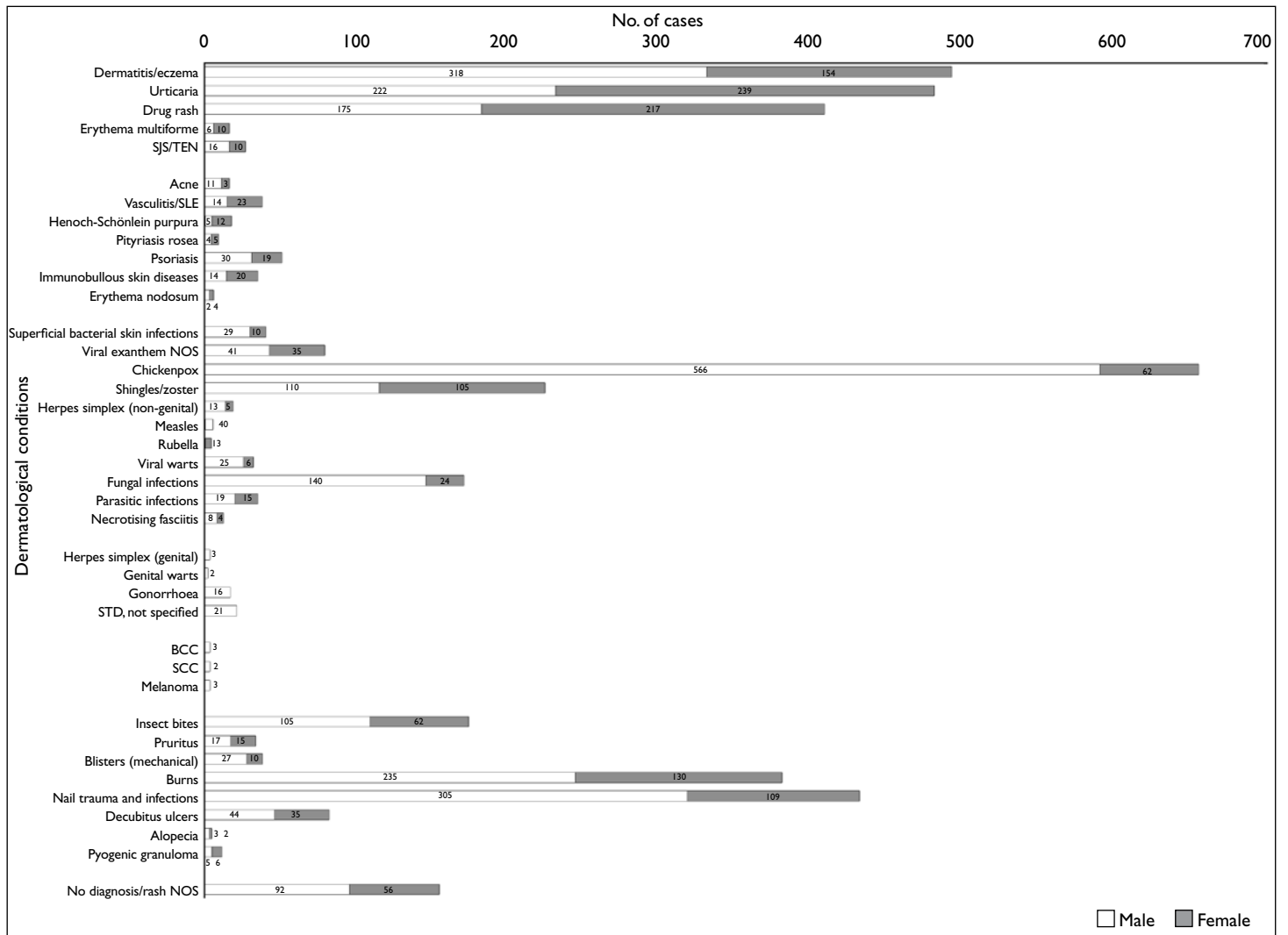
Emergency Department,  
Tan Tock Seng Hospital,  
11 Jalan Tan Tock Seng,  
Singapore 308433

Wang E, MBBS  
Medical Officer

Lim BL, MBBS  
Associate Consultant

Tham KY, MBBS  
FRCSE  
Senior Consultant

**Correspondence to:**  
Dr Etienne Wang  
Tel: (65) 9171 1740  
Fax: (65) 6254 3772  
Email: etiennewang@gmail.com



**Fig. 1** Bar chart shows the total attendances of dermatological conditions according to the diagnosis for the male and female patients.

presentations. Most of these patients were treated and discharged to recuperate at home. Dermatitis/eczema was also commonly seen in the ED, making up 11.6% of consultations. Urticaria was equally common, with 11.4% of dermatological consultations. Another common diagnosis was nail conditions (which included trauma, infections and ingrown toenails), contributing to 10.2% of dermatological consultations. Dermatological emergencies seen in the ED included necrotising fasciitis (12 cases, with 91.7% admissions and one patient discharging himself against medical advice), and Stevens-Johnson syndrome (SJS) or toxic epidermal necrolysis (TEN) (26 cases, 100% admission). Immunobullous disorders and vasculitic rashes were also commonly admitted (78% and 73% admission, respectively). Venereal diseases were rarely seen in the TTSH ED. Only 41 patients with a primary sexually-transmitted infection (STI) were seen, with a majority being referred to the STI clinic in Kelantan Lane.

Interestingly, two-thirds (65.3%) of all dermatological conditions diagnosed were male patients. Most conditions

analysed comprised predominantly male patients, especially venereal diseases (100% male). The conditions that were predominantly female cases were vasculitides (e.g. rash in systemic lupus erythematosus), Henoch-Schönlein purpura, erythema nodosum and measles. The mean age of all the patients was 37.9 (range 1–106) years. Among all the patients, 12.7% were admitted to hospital, 31.3% were referred to secondary care (e.g. NSC or other specialist clinics), 8.7% were referred back to primary care (e.g. general practitioners or polyclinics), and 44.1% were treated and discharged. A minority of 3.1% had other unspecified dispositions, such as discharge against advice or absconding.

## DISCUSSION

Dermatological conditions can be sudden in their onset and distressing to the patient. The appearance of a rash or any unfamiliar symptom on one's skin is often enough reason for one to seek medical attention. In Singapore, the ED is an accessible and convenient place for patients to

get immediate medical care, and a gateway for referrals to specialist care. The recognition of common rashes and viral exanthems is important. Chickenpox and shingles, being the most common disease, should be promptly recognised by doctors. This will save time in a busy ED and spare patients unnecessary investigations and delays. Timely recognition of dermatological emergencies such as SJS/TEN and necrotising fasciitis, as well as medically important conditions, such as immunological phenomena like vasculitides and immunobullous diseases, can also improve patient care and safety. The commonest, along with the most dangerous dermatological conditions encountered in the ED, should comprise the core teaching for medical students and junior medical staff.

The commonest dermatological condition presenting at the ED was Varicella zoster virus (VZV)-related exanthems, such as chickenpox and shingles, adding up to 20.8% of all dermatological consultations. This underscores the need for ED doctors and nurses to be aware of these conditions and their infectious potential, and to realise the need for personal protective equipment, so as to reduce nosocomial spread of the pathogen to other patients. Healthcare personnel should also be vaccinated against VZV before they begin work in the department. Among the patients presenting with chickenpox/VZV, a large majority (63.5%) comprised foreign workers (including tourists and students). TTSH does not have specialist services for paediatrics, obstetrics and gynaecology. Pregnant women and children tend to be referred or sent to the nearby KK Women's and Children's Hospital (KKH). Thus, a large proportion of Singaporean chickenpox patients (who will be in the paediatric age group) will be diverted to the ED of another hospital.

Allergic skin disorders such as dermatitis and eczema are also common, comprising 11.6% of all dermatological consultations. At the point of primary care, doctors should be able to treat the patients and educate them about the condition; for example, the importance of avoiding allergens and irritants while waiting for their specialist appointment. Clear and concise knowledge of steroid creams and the appropriate strengths for specific conditions will be invaluable in providing good initial care for the patient. Like many other conditions, there was a male predominance (67.4%) in this category. Unlike chickenpox/shingles, the majority of these patients (83.1%) were Singaporean. Furthermore, the gender ratio of atopic dermatitis in Singapore, as reflected by an outpatient study at the NSC, is 1:1.<sup>(3)</sup> This imbalance is interesting and might reflect a difference in the health-seeking behaviour between the genders, or a difference in the aetiology of the rash. However, our results do not differentiate between

atopic, allergic and other types of dermatitis, and thus the comparison with previous statistics must be done carefully.

Nail conditions made up 10.2% of all dermatological conditions seen. These included nail lacerations, ingrown nails, nail infections and paronychia. As such, procedures like nail avulsions should be taught to medical officers not experienced in the procedure. Contrary to reports that STIs are on the rise in Singapore in the last five years,<sup>(4)</sup> the attendances for STIs in the TTSH ED were extremely low ( $n = 41$ , 1% of total), and cases were exclusively male (100%). This could be explained by the ease of access to sexual healthcare in the Department of STI Control (DSC) in Singapore. Furthermore, women with genitourinary symptoms would more likely present to the Women's Clinic in KKH.

Dermatological emergencies were also seen in the ED. Necrotising fasciitis (0.3%) and SJS/TEN (0.6%) were seen, and all the cases were admitted for inpatient care (except for one patient who had necrotising fasciitis and refused admission). These conditions must not be missed, and doctors must be made aware of and able to identify the cardinal signs when seeing these patients. Necrotising fasciitis must be considered in patients with rapidly-progressing cellulitis, with or without systemic symptoms. Diabetic patients are particularly prone to this condition and should be treated with extra caution. Signs such as copious purulent drainage from the wound, crepitant cellulitis, or a necrotic appearance of the overlying skin, should alert the doctor to the development of necrotising fasciitis.<sup>(5)</sup> In the case of potentially serious drug reactions, doctors should be aware of systemic features such as fever, malaise, arthralgia, meningism and lymphadenopathy. Cutaneous signs to be aware of include target lesions, erythroderma, prominent facial involvement, angio-oedema, mucous membranes involvement, skin tenderness, blistering, skin shedding, and purpura.<sup>(5)</sup>

34 cases of immunobullous diseases (0.8%) were seen in 2007. These occurred almost exclusively in the elderly, with the median age of patients being 76.5 years. These blistering skin disorders, though uncommon, carry significant morbidity for those afflicted. Pain, infection, bleeding and occasionally fluid imbalances may result from large areas of blistering. Doctors should be aware of the potential complications of immunobullous diseases. In 2007, 148 (3.6%) cases presented with rashes, and were referred by the ED directly to a specialist clinic without a diagnosis. The reasons for this might include a lack of confidence in making a diagnosis, or a language barrier which prevented adequate history-taking. The former problem could be addressed by providing the referring

doctor with feedback on the unknown diagnosis from the specialist clinic. This will serve as a learning tool for ED doctors for future encounters with similar dermatological conditions.

In conclusion, dermatological conditions are not common in the TTSH ED, making up only 2.6% of attendances in 2007. The commonest skin conditions seen in TTSH are VZV-related exanthems. Other common dermatological problems such as dermatitis/eczema, urticaria and nail problems, should also receive some attention in the training of ED staff. It is important that doctors gain the relevant experience in treating dermatological conditions to ensure this small population receives the appropriate care and treatment.

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