

## Original article

# Prevalence and pattern of dermatological disorders in the pediatric emergency service

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## Abstract

**Background:** Dermatological disorders are common in children. This study sought to describe the prevalence and pattern of dermatological emergencies encountered in the pediatric emergency room (ER).

**Methods:** This was a retrospective study of patients with dermatological complaints visiting the pediatric ER at a teaching hospital in Saudi Arabia during the year 2014.

**Results:** A total of 44,162 ER visits were recorded among children aged  $\leq 13$  years, of which 2070 (4.7%) involved dermatological complaints. Over 80 dermatological conditions were encountered, the most common of which was atopic dermatitis (10.8%), followed by urticaria (9.7%). Categorization of diseases according to etiology revealed that the largest proportion of patients had infectious diseases (25.2%). Rare genetic disorders and life-threatening dermatological conditions were also encountered. A total of 10.5% of patients did not receive a diagnosis.

**Conclusions:** Our study revealed a high frequency and wide spectrum of dermatological disorders in the pediatric ER. Considering the high rate of undiagnosed cases, this study highlights the need to objectively measure physicians' abilities to diagnose dermatological disorders. Identification of common and potentially dangerous disorders can aid in the development of educational resources for trainees and in the allocation of future resources for the treatment of common conditions.

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**Keywords:** Curriculum development; Dermatology; Emergency care; Pediatrics; Primary care education; Rash

**Abbreviations:** CMCC, chronic mucocutaneous candidiasis; DOCK8, dedicator of cytokinesis 8; ER, emergency room; VZV, varicella zoster virus.

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## 1. Introduction

Disorders of the skin and its appendages, including the hair and nails, are frequently encountered in children. From a pediatrician's perspective, few studies have evaluated dermatological disorders encountered in the emergency room (ER).

Studies have shown that the frequency of ER visits for skin complaints is unexpectedly high, accounting for up to 17.4% of all ER visits (Kramkimel et al., 2010; Landolt et al., 2013). In addition, the observed cases cover

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a wide spectrum of disorders (Kramkimel et al., 2010; Wang et al., 2009). Most cases encountered are not true emergencies; nevertheless, evaluation of the skin can reveal serious underlying systemic diseases (Auvin et al., 2004; Hunter and Alsharqi, 2013).

This study sought to estimate the frequency and describe the spectrum of dermatological disorders observed in the pediatric ER of a tertiary center over a one-year period.

## 2. Materials and methods

A retrospective review was conducted of all consecutive pediatric patients aged 13 years or younger visiting the pediatric ER at King Fahad University Hospital, Al-Khobar, Saudi Arabia. Our hospital is the single tertiary center in the city, and it serves a large multi-ethnic and mixed social class population. The age range of selected patients was based on the legal age of pediatric care in Saudi hospitals. Patients included were those with either a dermatological complaint or a final diagnosis of a dermatological condition. Patients with a trauma-induced skin disorder or burn are typically managed by the trauma team and therefore are not generally seen in the pediatric ER. However, trauma or burn patients treated in the pediatric ER and recorded in the emergency database were included. This study was conducted between January and December 2014. The pediatric ER is part of the pediatric department and is staffed by on-site pediatric ER specialists and trainees. Patients with dermatological complaints are evaluated by pediatric ER staff because no dermatology ER service coverage is available. Patients may be referred to the on-call dermatologist in severe cases or when the diagnosis is in doubt. The information assessed in this study was obtained from the emergency database using the description of the final diagnosis documented in emergency logbooks and recorded by the ER physician. Patient information that was collected included the identification number, age, gender, complaint, final diagnosis, time and date of ER visit, medical conclusion, and admission or discharge history, including referrals to the dermatology outpatient services. A chart review was performed for cases with a nonspecific diagnosis, such as those labeled “rash” or “lesion” by the attending physician, or when any doubts existed with respect to the diagnosis. Revision of charts was performed by a pediatric consultant. Referral to senior staff and review of consultation notes, including visits to dermatology and specialized outpatient clinics, were performed to confirm the diagnosis in all ambiguous cases. Furthermore, the need for a dermatologic advice was determined from the chart reviews, including whether the advice was urgent or not. An advice was defined as a consultation with the on-call dermatologist, with the advice considered urgent if the dermatologist had been requested to see the patient within 24 h of the ER visit. In addition, we recorded whether the advice was obtained for the purpose of diagno-

sis or treatment and whether the dermatologist made any changes to either one. Conditions excluded were jaundice and anaphylactic shock. This study received ethical approval from the Institutional Review Board. The extracted clinical data were incorporated into a Microsoft Excel® spreadsheet. Qualitative data are expressed as frequencies and percentages. The mean and percentages were calculated as appropriate.

## 3. Results

A total of 44,162 visits to the pediatric ER occurred during 2014, of which 2070 (4.7%) were related to a dermatological disease or complaint. The cohort included 1113 males (53.8%) and 957 females (46.2%). The patient ages ranged from 4 days to 13 years, with a mean of  $7 \pm 2.3$  years. With respect to race, 87.5% of the patients were Saudi, and the remaining 12.5% were non-Saudi. The hospitalization rate was 2% ( $n = 42$ ). A total of 1825 patients (88.2%) were discharged with no referral, while 245 (11.8%) were referred to a dermatology clinic. Furthermore, 448 patient charts were revised, and pediatricians obtained advice from a dermatologist in 92 (20.5%) cases, either for diagnostic ( $n = 72$ ) or therapeutic ( $n = 20$ ) purposes. Among these cases, the need to be evaluated by a dermatologist was requested on an urgent basis for 15 (1.1%) patients. Moreover, the dermatologist changed the diagnosis or treatment provided by the pediatrician in 60 (83.3%) and 17 (85%) cases, respectively.

The presenting diseases included in 81 different dermatological disorders (Table 1). The identified skin-related conditions were classified into groups of associated conditions. Among the diagnostic groups, the most commonly observed was skin infections (25.2%), followed by dermatitis (23.5%), mucosal disorders (10.3%), and urticaria and angioedema (10.2%). Among the infections, viral infections were the most commonly encountered (13.6%), followed by bacterial (10.6%) and fungal infections (0.6%). Varicella zoster virus (VZV) infection was the most commonly observed viral infection, accounting for 5.2% of the total visits (chicken pox = 103 and herpes zoster = 4), followed by hand, foot and mouth disease (4.5%) and nonspecific viral exanthema (2.75%). Conversely, cutaneous abscesses, including boils, carbuncles and furuncles, were the most commonly encountered bacterial infections, accounting for 4.5% of the total visits. Atopic dermatitis/eczema was the most commonly observed single disease entity (10.8%), followed by urticaria (9.7%). In addition, visits related to insect bites were common (8.45%), followed by non-fungal diaper dermatitis, mainly caused by irritation (6.1%). Nonspecific dermatitis and gingivostomatitis were also commonly observed (5.7% and 5.65%, respectively). The 10 most common diseases encountered, accounting for approximately two-thirds of the entire cohort (63.35%), are listed in Table 2.

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