



REVIEW

Dermatological conditions in international pediatric travelers: Epidemiology, prevention and management



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Summary With an increasing number of children traveling internationally, there has been growing interest in studying the burden of travel-associated illnesses in children. We reviewed recently published (2007–2012) studies on travel-associated illness in children, and extracted the reported spectrum of dermatological conditions in children. Dermatologic problems are among the leading health concerns affecting children during and after return from international travel. Most are mild and self-limited, but an extended spectrum of conditions has been reported from a large retrospective multicenter study. Children may be especially at risk for infections related to environmental exposures, arthropod-related problems, and animal bites. Of note are also tropical and cosmopolitan systemic infections with potential for transmission in the receiving communities. Implications for pre- and post-travel care of children are emphasized.

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Introduction

Regardless of travel activity children frequently present with skin findings. Although most are not harmful and can be easily treated, clinicians who see children need to be skilled in recognizing potential life-threatening conditions that require specific treatment, and at times protective public health measures. Nowadays, families frequently travel with their children to international, and at times tropical destinations. According to a recent multicenter study of U.S. travel clinics 10% of all travelers receiving pre-travel care were children [1]. Furthermore, some children born in the U.S. or other developed nation return home after an extended sojourn in the tropical country of origin of their families, whereas other children travel for the purpose of immigrating or to live with a new family after an international adoption.

With such an increasing number of children traveling internationally, there has been growing interest to better understand the burden of travel-associated illness in children, and how it affects the range of diagnoses seen in acute and routine pediatric health care [2–6]. This paper will review the reported spectrum of dermatological conditions and manifestations in pediatric international travelers [2–6], and highlight how this range of diagnoses may differ from those reported for adult travelers. Implications for pre- and post-travel care of children are emphasized.

Epidemiology

Prospective observational studies of children traveling to the tropics showed that while preexisting skin problems such as eczema may frequently be present at the time of departure (11% of 157 Swiss children traveling to the tropics for a median of 16 days) and hence can potentially exacerbate during travel, an incidence rate for a “rash” (its nature was not further defined in this study) of 1.5 episodes per 100 person-weeks was calculated for the period during travel plus 4 weeks after return. In comparison, clearly higher incidence rates of 7.1 and 3.8 episodes per 100 person-weeks were reported for diarrhea and fever during the same observation period, respectively [2]. Adults in this study showed a similar incidence rate for an episode of rash [2]. In contrast, another prospective study of 152 Dutch children traveling for a median duration of 3 weeks to tropical and subtropical destinations found skin problems to be the leading cause of health concerns [3]. New skin problems during travel i.e. insect bites, pruritus and sunburn were reported by 40%, 20%, and 19% of participating children, respectively [3]. Of note, pediatric travelers to Asia and South and Central America reported skin problems more frequently than pediatric travelers to Africa [3]. In this study almost all of the dermatologic conditions were described as mild, only rarely affecting the planned activities or requiring a doctor/clinic intervention [3].

In single-site retrospective studies dermatologic conditions among children with a presumed travel-related illness were reported in 8% of 328 children (0–16 years of age) presenting acutely to the emergency department of the University of Zürich Children’s Hospital [4], and in 21% of 774 children referred to a University travel clinic in Munich

[5]. Most diagnoses in the latter study were secondary bacterial infection of insect bites and cutaneous larva migrans (CLM) affecting 4% and 3% of all children seeking care at this clinic after return from travel, respectively [5]. In the hitherto largest published case series of ill returning pediatric travelers dermatoses was the second most common diagnosis category after diarrhea, afflicting 25% of 1591 pediatric travelers returning from 218 global destinations and presenting for care to 39 GeoSentinel Surveillance Network clinics in 19 countries [6]. Most of the observed skin problems were related to animal and arthropod bites and CLM (Table 1). Children were diagnosed with dermatologic conditions more frequently than adults, and specifically animal bites and CLM were found more frequently in them. Further, younger children seemed to present with more skin problems than older children as was also suggested by the studies from Munich and Zürich, although this association did not hold in the multivariate analysis performed in the GeoSentinel study. Exposure in Latin America, in particular the Caribbean, was associated

Table 1 Skin-related diagnoses in pediatric travelers visiting GeoSentinel clinics, 1997–2007.^a

Diagnosis	Percentage of children returning ill from international travel (N = 1591)
Animal bites ^b	6.0
Cutaneous larva migrans	4.2
Arthropod-related dermatoses ^c	3.0
Bacterial skin infections	2.1
Dengue	1.5
Enteric fever	1.3
Fungal infections	1.3
Allergic rash	1.2
Systemic viral infections with rash ^d	1.1
Cutaneous leishmaniasis	1.0
Mononucleosis syndrome ^e	0.9
Strongyloidiasis ^f	0.8
Other parasitic infections (myiasis, tungiasis)	0.7
Other tropical dermatoses ^g	0.6

^a Modified from Ref. [6].

^b Animal bites were mostly dog bites (N = 49), cat bites (N = 19), and monkey bites (N = 18). Rabies postexposure prophylaxis was given to almost all (97%).

^c Arthropod dermatoses followed exposure to mosquitoes (N = 37), scabies (N = 6), ticks (N = 3), and lice (N = 1).

^d Systemic viral infections presenting with a rash were varicella (N = 5), chikungunya fever (N = 3), infection with *Parvovirus* (N = 3), unknown etiology (N = 5), and measles (N = 1).

^e Mononucleosis syndromes were infection with Epstein–Barr virus (N = 8), infection with cytomegalovirus (N = 1), and infection with *Toxoplasma gondii* (N = 5).

^f Most cases were primary intestinal strongyloidiasis and presented primarily with gastrointestinal symptoms.

^g Other tropical dermatoses were loiasis (N = 6) onchocerciasis (N = 2), acute unspecified filariasis (N = 1), and leprosy (N = 1).

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