SPECTRUM OF DERMATOSES IN 165 TRAVELERS RETURNING FROM THE TROPICS WITH SKIN DISEASES

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Abstract. The spectrum of dermatoses occurring in travelers returning from tropical areas is poorly documented. We analyzed the relative frequency of travel-associated dermatoses and their possible relationships to travel characteristics in all persons who came to our hospital between November 2002 and May 2003 for a cutaneous disorder related to travel in a tropical country. One hundred sixty-five travelers were included. The main dermatoses identified were infectious cellulitis (12.7%), scabies (10.3%), and pruritus of unknown origin (PUO) (9.1%). Tropical dermatoses accounted for 33.9% of the cutaneous disorders. Univariate analysis showed statistically significant correlations of infectious cellulitis with females, PUO with older age and immigrant status, pyoderma with expatriate status, scabies with tourism and travel to Africa, myiasis with tourism and travel to Africa and America, filariasis with travel to Africa and immigrant status, and cutaneous larva migrans with tourism. Dermatoses diagnosed in travelers returning from the tropics seemed to be influenced by traveler status and region visited.

INTRODUCTION

Dermatoses with respiratory tract infections and diarrhea are a leading cause of health impairment in travelers returning from tropical countries.1 A prospective study of travel-associated dermatoses observed after return showed that 53% of these dermatoses were of tropical origin.2

Knowledge of tropical dermatoses among western physicians is limited, and this can delay diagnosis and effective treatment. This is illustrated by a study of cutaneous leishmaniasis, where the median time from lesion onset to treatment initiation was 112 days (range = 0–1,032 days).3 Similarly, 55% of 64 patients with cutaneous larva migrans (CLM) had already consulted a general practitioner or a dermatologist (mean number of consultations = 2, range = 1–6) before the correct diagnosis was made.4 Thus, we analyzed the distribution of dermatoses diagnosed in travelers returning from the tropics and examined the association between skin diseases, including imported tropical dermatoses, and the patient and travel characteristics.

PATIENTS AND METHODS

This was an observational monocentric study. We prospectively included all consecutive patients who came to our tropical diseases unit in Paris, France, from November 1, 2002 to May 31, 2003 with skin disease that had occurred during travel or within three months after return from a tropical country, regardless of the duration of the skin disease.

We studied the following epidemiologic data: age, sex, category of traveler (immigrants, expatriates, tourists, business persons), and travel history (destination and duration). Travel destinations were classified according to the tropical region visited: America (including the Caribbean), Asia, Africa, and Oceania.

Patients were classified as immigrants, expatriates, business travelers, or tourists according to the reasons for travel. Immigrant travelers were defined as foreign-born French residents returning from their home country after a visit to relatives or friends. Expatriates were defined as French-born persons living in the same tropical country for more than six months. Business travelers were defined as French-born persons working for a short time in a tropical country. Tourists were defined as French-born persons visiting at least one tropical country, regardless of the duration of travel.

The intervals between returning to France and coming to our unit and between returning to France and symptom onset were taken into account in each case. Final diagnoses were made by the two clinicians who examined the patients (S.A. and E.C.): one was certified in infectious diseases and dermatology (E.C.). Infectious diseases were diagnosed by pathogen detection (myiasis, tungiasis, dermatophytosis, scabies, filariasis) or by seropositivity for an infectious agent compatible with the clinical manifestations (viral infections, filariasis, gnathostomiasis, schistosomiasis). If no specific pathogen was identified, the diagnosis was based on epidemiologic and clinical grounds (infectious cellulitis, CLM, ciguatera) or the response to specific treatment (scabies).

The relative frequency of diagnosed dermatoses and their associations with demographic and travel characteristics were analyzed with SPSS software version 9.0 (SPSS, Chicago, IL). The statistical significance of differences in dichotomous variables was determined by using chi-square or Fischer exact tests. The statistical significance of differences among continuous variables was determined by using Student's t-test. The alpha risk was set at 5% (two-tailed).

RESULTS

One hundred sixty-five patients came to our unit with a cutaneous disorder during the study period. There were 67 women and 98 men (male:female ratio = 1.46). They consisted of 74 tourists (44.8%), 51 immigrants (30.9%), 27 expatriates (16.4%), and 13 business travelers (7.9%). Their median age was 36.4 years (range = 17–64 years). The following regions were visited: Africa (n = 89, 53.9%), Asia (n = 57, 34.5%), America (n = 15, 9%), and Oceania (n = 4, 2.4%). The median duration of travel was 31.7 days (range = 1–120 days).

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The median interval between return and presentation was 13 days (range = 1–27 days). One hundred twenty-four travelers (74.9%) consulted within two weeks after their return. Symptoms started during travel in 98 patients (59.4%). In the remaining 67 patients, the median interval between return and clinical onset was 7 days (range = 1–16 days). Ninety-four patients (57%) were referred to our unit by another clinician. Among the 165 dermatoses, the main etiologic diagnoses and symptoms were infectious cellulitis (12.7%), scabies (10.3%), pruritus of unknown origin (PUO) (9.1%), pyoderma (8.5%), myiasis (7.3%), dermatophytosis (6.1%), filariasis (5.4%), CLM (4.8%), and urticaria (4.8%). Other diagnoses and symptoms included tungiasis, herpes, zona, contact dermatitis or eczema, leprosy, febrile rash, cutaneous adverse drug reactions, ciguatera, late cutaneous schistosomiasis, and other various dermatoses (Table 1).

Of the seven cases of febrile rash in this cohort, four were caused by dengue fever, and one each by Epstein-Barr virus, parvovirus B19, and African tick bite fever. Overall, 56 diagnoses (33.9%) corresponded to imported tropical diseases.

Scabies was diagnosed by microscopy (identification of mites and/or eggs) or by a good response to specific treatment in the 17 patients. Patients were cured with ivermectin alone or in combination with benzyl benzoate in 7 patients (41.2%) and with benzyl benzoate in 10 patients (58.8%).

Regarding the most common dermatoses, infectious cellulitis was significantly associated by univariate analysis with female sex ($P < 0.001$), PUO with older age ($P < 0.001$) and immigrant status ($P < 0.001$), and pyoderma with expatriate status ($P = 0.006$). Of the 21 patients with infectious cellulitis, 6 (28.6%) reported insect bites and development of the cellulitis at the site of the bite. Regarding tropical imported dermatoses, univariate analysis showed some significant associations regarding myiasis, filariasis, and CLM (Table 2). Multivariate analysis was not performed because of an insufficient number of patients for most of the categories.

### Table 1

<table>
<thead>
<tr>
<th>Diagnoses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious cellulitis</td>
<td>21</td>
</tr>
<tr>
<td>Scabies</td>
<td>17</td>
</tr>
<tr>
<td>Pruritus of unknown origin</td>
<td>15</td>
</tr>
<tr>
<td>Pyoderma</td>
<td>14</td>
</tr>
<tr>
<td>Myiasis</td>
<td>12</td>
</tr>
<tr>
<td>Dermatophytosis</td>
<td>10</td>
</tr>
<tr>
<td>Filariasis</td>
<td>9</td>
</tr>
<tr>
<td>Cutaneous larva migrans</td>
<td>8</td>
</tr>
<tr>
<td>Urticaria</td>
<td>8</td>
</tr>
<tr>
<td>Tungiasis</td>
<td>7</td>
</tr>
<tr>
<td>Herpes zoster, zona</td>
<td>6</td>
</tr>
<tr>
<td>Contact dermatitis, eczema</td>
<td>6</td>
</tr>
<tr>
<td>Leprosy</td>
<td>4</td>
</tr>
<tr>
<td>Relapse of chronic dermatoses*</td>
<td>12</td>
</tr>
<tr>
<td>Miscellaneous†</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>165</strong></td>
</tr>
</tbody>
</table>

* Including psoriasis, acne, erythema multiforme, and vasculitis.
† Including late cutaneous schistosomiasis (1), adverse cutaneous drug reaction (2), ciguatera (3), febrile rash (including reketoses, parvovirus B19, Epstein-Barr virus) (3), dengue fever (4), and gnathostomiasis (3).

### DISCUSSION

Skin diseases are a leading cause of consultation for travelers returning from the tropics, accounting for 23.4% of the 637 diseases diagnosed in 622 travelers seen after return in our center. Similarly, of the 17,353 travelers seen after return in the Geosentinel experience, 2,947 (17%) visited a clinic for treatment of a dermatologic disorder. Tropical dermatoses accounted for 33.9% of the dermatoses seen in this series. In a 10-year old similarly designed prospective study of 269 French travelers returning from the tropics that excluded immigrants and expatriates, tropical skin diseases accounted for 53% of the dermatologic diagnoses. This figure was 40% in the present cohort when we excluded these two categories of travelers. Therefore, between one-third and half of travelers who came to our unit with a skin disease had an imported tropical dermatosis.

We diagnosed the following imported tropical dermatoses in this study: myiasis, filariasis, CLM, tungiasis, dengue fever, leprosy, ciguatera, gnathostomiasis and late cutaneous schistosomiasis. Fifty-one (30.9%) of our patients were immigrants who visited friends or relatives, and these travelers were more likely to have filariasis than travelers born in France. In addition, leprosy was only observed in this subcategory of patients. In contrast, myiasis, and CLM were diagnosed more often in tourists (Table 2) and rash of dengue fever was observed only in tourists.

The spectrum of tropical dermatoses diagnosed in our study shared some similarities with those observed in two other studies. In the above referenced GeoSentinel study, the main skin diseases diagnosed in 2,947 patients were insect bites, with or without superinfection, CLM, allergic reaction, skin abscess, rash of unknown origin, mycosis, leishmaniasis, myiasis, itch, impetigo or erysipelas, and mite infestation. Because the part of imported tropical diseases is not given in the GeoSentinel study, we cannot compare this result but the frequency of tropical dermatoses is probably overestimated in studies like ours because travelers consult hospitals rather than travel clinics and are more likely to be referred by a general practitioner, as was the case in 57% of our patients.

Studies of health impairments that occur during travel show a more cosmopolitan pattern of skin diseases, with the most frequent being arthropod infestation, scabies, sunburn, contact allergy, bacterial and fungal skin infections, and injuries caused by marine creatures. The lack of tropical dermatoses in these studies may be due to several factors: in particular, the often lengthy incubation periods of these diseases may explain their clinical onset after return from travel. Also, the fact that this study took place in a tropical diseases unit may explain why relatively few non-infectious dermatoses were diagnosed. Our unit is one of the two reference centers for tropical diseases, especially for skin diseases, in Paris.

Bacterial skin infections are a major threat to travelers. Infectious cellulitis was the leading cause of dermatoses in this study and was also the most frequent dermatosis arising during travel abroad in a prospective questionnaire-based study. Bacterial skin infections were also a major cause of dermatoses in on-site studies performed in Nepal, Fiji, The Maldives, and Burkina Faso. Pyoderma was the second most common cause of dermatosis in the previously mentioned study of 269 French travelers returning from the tropics. In
this study, impetigo was caused by either Streptococcus pyogenes or Staphylococcus aureus and was secondary to an insect bite or sting in 63% of the cases.2 This frequency was 28.6% (6 of 21) in this study. Subsequently, travelers should be instructed to use insect repellents to avoid arthropod exposure. Given the severity of infectious cellultis, travelers at risk should also be advised to carry effective antibiotics.

Pruritus was a leading cause of consultation in our population. Scabies and PUO were the second and third most common dermatoses diagnosed in this study. The frequency of scabies is not surprising, given the frequency of this disease among travelers.2 7 Ciguatera is another cause of generalized pruritus and was observed in three patients. Regarding PUO, it is noteworthy that 13 of the 15 cases were diagnosed among immigrants originating from Africa, none of whom had pruritic dermatoses such as scabies or filariasis. In our experience, PUO is a leading reason for seeking medical advice among French immigrants of African origin. In a series of 60 dermatoses observed among foreign immigrants in France (92% from Africa), pruritus was the cause of consultation in 21 cases (35%), including 10 cases (16.7%) of PUO (Caumes E and others, unpublished data). Therefore, PUO in this setting could be due to acclimatization. In addition, Africans bathe frequently and use detergents. By doing so, they defat their skin, which leads to xerosis and itching. In addition, the in-house, in-office climate in Europe is often dry, which increases the problem.

Finally, we diagnosed several other cutaneous diseases in travelers returning from abroad, such as adverse cutaneous drug reactions, ciguatera fish poisoning, and gnathostomiasis. Adverse cutaneous reactions are a treatment-limiting effect of antimalarial drugs. In a prospective study of the tolerability of malaria chemoprophylaxis in 623 non-immune travelers to sub-Saharan Africa, the highest incidence of moderate or severe skin problems were observed among persons receiving chloroquine-proguanil (8% versus 3% for doxycycline, 2% for atovaquone-proguanil, and 1% for mefloquine; P = 0.013).9 Cutaneous gnathostomiasis is also increasingly reported in travelers returning from disease-endemic countries.10

Whereas 149 (90.3%) of the 165 skin diseases in our study were acute, 16 (9.7%) were chronic. Most of them were a cause of consultation because travel induced a relapse of a chronic condition (e.g., psoriasis and acne) or because travel was so long that the dermatose (e.g., leprosy) appeared during travel as a coincidental event.

This study shows that imported tropical diseases still represent one-third of skin diseases among travelers returning from the tropics, with the spectrum of skin diseases being most influenced by traveler status and region visited. Given the frequency of bacterial skin infections and the arthropod origin of most cases of imported dermatoses, travelers to the tropics should be specifically advised to use insect repellents for reasons other than malaria prophylaxis.

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REFERENCES