Parasitic infestations

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INTRODUCTION

Parasitic infestations continue to be a public health problem in today's world, especially in developing countries where there is poverty, overcrowding, and a diminished emphasis on public health. Over the last decade, many new discoveries have been made about the diagnosis and treatment of the various dermatologic diseases caused by parasites that infest humans. This periodic synopsis summarizes cutting-edge research on the most common ectoparasite infestations; thus the focus will not be on topics such as clinical diagnostic techniques or manifestations of disease, except where new findings have been reported. Some older, but classic, articles which continue to be useful today have been included as well. We have chosen to discuss ectoparasitic organisms which infest the skin, and only the most common protozoa and worms; the infestations include scabies, pediculosis, myiasis, cutaneous larva migrans (CLM), cutaneous schistosomiasis, and cutaneous and mucocutaneous leishmaniasis. The periodic synopses on tropical dermatology published in this Journal (Schmid-Grendelmeier P, Mahe A, Pannighaus JM, Welsh O, Stingl P, Leppard B: Tropical dermatology. Part I. J Am Acad Dermatol 2002; 46:571-83; Welsh O, Schmid-Grendelmeier P, Stingl P, Hafner J, Leppard B, Mahe A. Tropical dermatology. Part II. J Am Acad Dermatol 2002;46:478-63) are good references for some of the more rare entities. We hope that this synopsis will be a useful update.

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This report reflects the best data available at the time the report was prepared, but caution should be exercised in interpreting the data; the results of future studies may require alteration of the conclusions or recommendations set forth in this report.

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Abbreviations used:

ATP:	adenosine triphosphate
CL:	cutaneous leishmaniasis
CLM:	cutaneous larva migrans
ELM:	epiluminescence microscopy
IL:	interleukin
ITS1:	internal transcribed spacer 1
kDNA:	kinetoplasts DNA
MBCL:	methylbenzethonium chloride
PCR:	polymerase chain reaction
SLME:	spliced leader mini exon
STD:	sexually transmitted disease
TMP:	trimethoprim/sulfamethoxazole

General references

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Angel TA, Nigro Y, Levy ML. Infestations in the pediatric patients. Pediatr Dermatol 2000;47:921-35.

Heukelbach J, Walton SF, Feldmeier H. Ectoparasitic infestations. Curr Infect Dis Rep 2005;7:373-80.

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Sangueza OP, Lu D, Sangueza M, Pereira CP. Protozoa and worms. In: Bolognia JL, Jorizzo JL, Rapini RP, editors. Dermatology. London: Mosby; 2003. pp. 1295-320.

Epidemiology

Both scabies and lice have worldwide prevalence, while the other infestations discussed in this synopsis are found mostly in tropical and subtropical areas. Infestations with ectoparasites in general are thought to be most common in poor and/or rural individuals from third-world countries found in the tropics or subtropics, with the exception of head lice that is prevalent in all socioeconomic groups.

Because neither pediculosis nor scabies are reportable diseases in the United States, exact incidence is unknown. However, it has been estimated that between 6 million and 12 million people per year are diagnosed with pediculosis capitis, while likely less than 1% of the US population are diagnosed with scabies. Although US-acquired myiasis has been reported in rare instances, other parasitic infestations diagnosed in Americans are acquired almost exclusively by traveling to endemic areas.

Freedman DO, Weld LH, Kozarsky PE, Fisk T, Robins R, von Sonnenburg F, et al. Spectrum of disease and relation to place of exposure among ill returned travelers. N Engl J Med 2006; 354:119-30.

Specialized travel/tropical medicine clinics on 6 continents collected data for 17,353 ill travelers returning from 6 developing regions of the world. Patients were from Europe (49%), United States/Canada (33%), Israel (8%), Australia/New Zealand (8%), and other sites (3%). Dermatologic problems occurred disproportionately among those returning from the Caribbean or Central or South America. Overall, insect bites were most common (187 cases per 1000 patients seen), followed by cutaneous larva migrans (CLM) (129 cases/1000 patients), allergic reactions (113 cases/1000 patients), and skin abscesses (97 cases/1000 patients). CLM was the most common dermatologic condition among patients returning from the Caribbean and was significantly more common in this population than from those returning from sub-Saharan Africa, south central Asia, or Central or South America. Leishmaniasis (38 cases/1000 patients) was most common among those who had traveled to South America or, less so, Central America. Myiasis (35 cases/1000 patients) was most common among those who had traveled to South or Central America. Tungiasis was not in the top 12 most frequent dermatologic diagnoses and thus had an incidence of less than 22 cases per 1000 patients seen.

Inanir I, Sahin MT, Gunduz K, Dinc G, Turel A, Ozturkcan S. Prevalence of skin conditions in primary school children in Turkey: differences based on socioeconomic factors. Pediatr Dermatol 2002;19:307-11.

A total of 785 students from 2 schools of statistically differing socioeconomic parameters in Turkey were examined. Parasitic diseases were found more often in the school with poorer socioeconomic conditions (16.8% vs 5.5%; $P < .001$), specifically pediculosis (13.4% vs 5.2%; $P < .001$) and scabies (4.0% vs 0.3%; $P < .001$). Except for nevi and eczema, parasitic infestations were the most frequent skin conditions in both schools with combined prevalence rates of 9.4% for pediculosis and 2.2% for scabies. Most of these infestations were ignored or unrecognized. Girls had pediculosis capitis more often than boys ($P < .001$). Presence of parasitic infestations was correlated with family income that was less than expenses ($P < .001$), a poorly educated mother ($P < .001$), a poorly educated father ($P < .01$), a higher number of siblings ($P < .001$), and with bad housing conditions ($P < .001$) as defined by two or fewer rooms, outside toilets, no bathroom, and no tap water supply.

Heukelbach J, Wilcke T, Winter B, Feldmeier H. Epidemiology and morbidity of scabies and pediculosis capitis in resource-poor communities in Brazil. Br J Dermatol 2005;153:150-6.

Cross-sectional surveys were performed in an urban slum in Brazil (n = 1460) and a fishing community 60 km south of the city (n = 605), examining participants for scabies and pediculosis capitis. Prevalence of pediculosis capitis was 43.4% in the slum and 28.1% in the fishing community; prevalence of scabies was 8.8% and 3.8%, respectively. In both study areas, pediculosis capitis was most commonly seen in children aged 10 to 14 years and was twice as common in female as in male children. Secondary infection in patients infested with scabies was common (19%-23%).

Public health aspects

Heukelbach J, van Haeff E, Rump B, Wilcke T, Moura RCS, Feldmeier H. Parasitic skin diseases: health care seeking in a slum in northeast Brazil. Trop Med Int Health 2003;8:368-73.

In a cross-sectional survey of overcrowded Brazilian slums, 1185 of 1460 (81%) inhabitants were examined for parasite infestations and point prevalence rates were as follows: head lice, 43.3%; tungiasis, 33.6%; scabies, 8.8%; CLM, 3.1%. Of those examined, 62.5% had any parasitic skin disease, whereas 23.5% were infested with more than one parasite. A second study discovered that of 288 visitors to the Primary Health Care Center adjacent to the slum, prevalence rates were as follows: head lice, 38.2%; tungiasis, 19.1%; scabies, 18.8%; cutaneous larva migrans, 2.1%. Only 35 of 159 (22%) infected persons came to the health clinic to be treated for parasites and only 33 of 159 (21%) had their ectoparasites diagnosed by a Primary Health Care Center clinician. Although ectoparasite diseases are hyperendemic in the study area, they are in large part ignored by both patients and physicians.

Taplin D, Porcelain SL, Meinking TL, Athey RL, Chen JA, Castillero PM, et al. Community control of scabies: a model based on use of permethrin cream. Lancet 1991;337:1016-8.

Before treatment, the prevalence of scabies on the island of Ticantiki, Panama, was 33% and that of lice more than 90%. Using 5% permethrin cream for one application, everyone with scabies infestations was treated, and after 3 months the prevalence of scabies dropped to 0.7%. Over a 3 year period, the only new cases discovered were the result of new introductions or contact with other communities, and all were again treated with 5% permethrin. The annual incidence was 13%, but prevalence remained low at around 1.5%. Lice were also virtually eliminated. Consequently, bacterial skin infections also dropped significantly; prevalence remained below 2% as long as scabies was controlled. Because of political