Illness from abroad: presentation and diagnosis of tropical diseases

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With an increase in international travel and the number of people visiting exotic places, most GPs are likely to see at least one case of a tropical disease in their career. Dr Brightman considers the questions to ask when taking the history, before discussing the more common presentations of tropical diseases and which laboratory investigations are of value in their diagnosis.

The tropics begin at Calais. A few diseases such as leishmaniasis (Figure 1) and enteric fever, which most doctors regard as tropical, are found in southern Europe, particularly Italy. Vivax malaria, often called benign tertian malaria, was endemic in marshy areas around Rome well into the 20th century. It was also present in parts of England up to the 17th century: the ‘ague’ mentioned in Shakespeare’s plays was probably vivax malaria. It could return to these areas.

Diseases such as typhoid, cholera and louse-borne typhus, which used to be endemic in this country, are now confined to warm climates.

THE CLINICAL HISTORY
An ill patient who has returned from a warm climate may not have a ‘tropical’ disease. He or she could have acquired an infection or another illness soon after returning to England, or the symptoms and signs may be caused by an exacerbation of a pre-existing illness. It is essential to obtain a ‘past medical history’ at the beginning of the consultation. Thus diarrhoea may be caused by a ‘flare-up’ of irritable bowel disease, rather than a parasitic or bacterial infection of the gut, although the two can co-exist.

It is important to find out whether the patient is immunosuppressed, as a result of a disease such as HIV, or treatment with steroids or chemotherapeutic agents. Immunosuppression can make patients more susceptible to certain diseases such as leishmaniasis. It can also increase the severity of many infectious and parasitic diseases.

People with diabetes mellitus are also more susceptible to certain infections such as tuberculosis and melioidosis. The latter, caused by *Burkholderia pseudomallei*, is endemic in Thailand and parts of Australia.

Type of holiday and countries visited
It is essential to know when the patient became ill. If the illness started more than a month after returning to this country, viral haemorrhagic fevers can be excluded and enteric fever is unlikely. The incubation of typhoid fever is usually two to three weeks. As some tropical diseases, usually those that are vector-borne, have a restricted geographical distribution, the patient should be asked which countries he
Rhodesian sleeping sickness caused by antelopes, as these are reservoirs for are large numbers of game, such as flies, which transmit sleeping sickness. This is particularly so in areas where there are large numbers of game, such as antelopes, as these are reservoirs for Rhodesian sleeping sickness caused by Trypanosoma rhodesiense.

A person camping in the bush, particularly if he has been walking in long grass, is at risk from tick-borne infections. In parts of Africa he will risk being bitten by tsetse flies, which transmit sleeping sickness. This is particularly so in areas where there are large numbers of game, such as antelopes, as these are reservoirs for Rhodesian sleeping sickness caused by Trypanosoma rhodesiense.

Discrete enquiries about sexual activities are important. HIV infection is prevalent throughout Africa and Asia, and can be acquired as a result of a ‘one-night stand’ with an infected individual. It can present as an acute glandular fever-like illness. Ask whether the patient had travelling companions and, if so, whether they had a similar illness. If all members of a group have had diarrhoea, for example, the illness is more likely to be bacterial or viral food poisoning, perhaps acquired during the return journey, than some exotic disease.

The time a patient has been at home before becoming ill is important as it enables certain diseases to be excluded. It is important to remember that malaria can develop months after a person has left an endemic area. Rare infections such as strongyloidiasis can develop years after a person has left an endemic area. The helminth remains in the body for years and produces symptoms when the immune system has become less effective through age or because of some other disease. This has been seen in soldiers who were prisoners of war of the Japanese.

Chemotherapy and immunisation history
Ask the patient whether he has taken chemotherapy against malaria, and also whether he slept under a mosquito net. Chemoprophylaxis, and especially sleeping under a net, reduces the risk of contracting malaria, although it does not abolish it entirely. A patient who has taken chemoprophylaxis is much less likely to develop severe malaria than one who has taken none.

The immunisations that have been taken are important. Some vaccines, such as those against yellow fever and rabies, are extremely effective, whereas those against cholera and typhoid, especially the former, are much less so. This may be because viruses consist mostly of protein, which is a very good antigen. Bacteria contain both protein and carbohydrate: the latter does not produce a good antigenic response.

Local treatment
If a patient became ill while abroad, he should be asked whether he was seen by a local doctor and, if so, whether any investigations were done. This information must be interpreted with care. Little reliance can be placed on a comment such as ‘I went to see a doctor who said that I had enteric fever and gave me some antibiotic to take’. However, a letter from a local doctor plus the results of appropriate investigations can be very helpful.

PRESENTATION OF TROPICAL DISEASES
Most tropical diseases present with a rash, diarrhoea or fever, or a combination of two or all three of these symptoms. Remember that poliomyelitis is still prevalent in some parts of the world. It can present as a fever with or without neurological signs.

Rashes and ulcers
These can be localised or generalised. Conditions such as insect bites, larva currens due to hookworm larvae, scabies, flesh flies and chigger fleas (Tunga penetrans) should be considered as the cause of localised skin lesions. Lyme disease produces a characteristic lesion called erythema chronicu migrans. Consider this disease in patients who have returned from North America or certain parts of England such as the New Forest.

Leprosy is still endemic in Africa and India. It has an incubation period of many years, and is likely to be seen only in people who have lived in poor conditions in endemic areas. This diagnosis should be considered if the patient has areas of depigmentation associated with reduced sensation.

Corynebacterium diphtheriae can cause skin ulcers that are known as ‘veld sore’ because they were first described in British soldiers during the Boer War. This is still found in parts of Africa. The strains of the diphtheria bacillus that cause these lesions are toxogenic, so the patient is likely to have the clinical features of faucial diphtheria, even though the lesion is
confined to the skin. These patients are infectious, so another person can acquire faecal diphtheria from them.

Cutaneous leishmaniasis, caused by protozoa of the genus *Leishmania*, is probably the most common cause of skin ulcers (see Figure 1). These lesions are usually found on exposed areas such as the face and limbs. Cutaneous leishmaniasis is common in the tropics and in the Middle East, including Israel.

The most likely causes of a generalised rash are acute HIV infection and syphilis. Syphilis is becoming more common and the rash of secondary syphilis can mimic that of many skin diseases. Rickettsial diseases, apart from Q fever, produce a rash that is not confined to the skin. These patients are infectious, so another person can acquire such infections from them.

**Fever**
This is a common but unhelpful sign, which can occur in a large number of diseases, many of which are not confined to the tropics.

Malaria is the first and most important diagnosis that must be excluded in any patient returning from the tropics with a fever. Systemic leishmaniasis or kala-azar also causes a remittent fever. It is found in the south of Italy, in addition to Africa and India. Patients who are HIV positive are more likely to develop a severe infection. Massive splenomegaly is usually present. Brucellosis is endemic in some parts of the tropics. It produces malaise, fever and a variety of non-specific signs. It is diagnosed by serology.

A doctor should speak to the consultant microbiologist at his local hospital in the unlikely event that he sees a patient who might have a viral haemorrhagic fever. On no account should the patient be sent to the local accident and emergency department, nor should blood samples be taken in the surgery. If the consultant microbiologist thinks that this is a possible diagnosis, he will arrange for the doctor to speak to an infectious diseases physician who, if necessary, will arrange for the patient to be transported to a specialist unit.

**Diarrhoea**
Diarrhoea is a common symptom in a patient returning from the tropics. It is usually caused by a viral, bacterial or parasitic infection of the gut, although it can be seen in conditions such as malaria. Post-infective diarrhoea may persist after a patient has recovered from a viral or bacterial infection of the gut. It is thought to be caused by intolerance to lactose.

Cholera causes torrential diarrhoea. The incubation period is a few days. The patient will probably be too ill to travel, so doctors in this country are unlikely to see a case. Enteropathogenic strains of *Escherichia coli* and *Giardia lamblia* are probably the most common cause of travellers’ diarrhoea.

**DIAGNOSIS OF TROPICAL DISEASES**
As in all branches of medicine, a raft of investigations is unlikely to be helpful. Such an approach inevitably produces some results that are outside the normal range. The practitioner then causes the patient further anxiety trying to find the cause of the abnormality. It is important to engage the brain before using the pen.

A travel history should always be written on a laboratory request form, especially when an exotic disease is suspected.

**Serology**
Serological tests are of value in the diagnosis of viral and rickettsial diseases, and some helminthic infestations such as schistosomiasis and filariasis. They are also of value in some bacterial infections such as melioidosis, brucellosis and Lyme disease. They are of no value in the diagnosis of malaria or enteric fever. The Widal test is now done in few, if any, laboratories in this country. Serological tests are also used to diagnosis syphilis, but they will be positive in other treponemal infections such as yaws and pinta. This must be remembered when a patient returning from a tropical country has ‘positive’ tests for syphilis.

Serological tests are likely to be positive in amoebic abscesses of the liver, but are of little help when the infection is confined to the gut.

**Haematology**
Examination of a thick and thin blood film is still the most useful test for the diagnosis of malaria, African trypanosomiasis and many filarial infections, although the presence of many microfilaria in the peripheral blood is periodic. Few malaria parasites may be seen in the blood of a patient who has lived in the tropics for many years and acquired some immunity to this disease. It takes skill and experience to see malaria parasites in a peripheral film, especially if the parasitaemia is low. Several blood films should be examined before the diagnosis of malaria is excluded. If there is any doubt about the reliability of such a test, blood samples should be sent to a laboratory whose staff have experience in the diagnosis of malaria.

Eosinophilia is common in helminthic infections in which the larvae of the adult worms migrate throughout the body. It is very uncommon in infestations in which the parasite has no developmental phase outside the gut, such as a tapeworm infestation.

**Microscopy of stool and urine samples**
This is still the cheapest and easiest way to diagnose helminthic infections of the gut. The sensitivity of this test depends on the skill and experience of the microscopist. In the future, molecular biological techniques such as the polymerase chain reaction are likely to become important for the detection of helminthic infestations of the gut. Unfortunately, the cost of such methods is likely to preclude their use in underdeveloped countries.
It is important to remember that ova and cysts are often secreted intermittently, so that the fact that nothing is seen on microscopy does not exclude the diagnosis. Several stool samples should be sent to the laboratory. Microscopy of an aspirate from the duodenum is often more reliable for the diagnosis of giardiasis than microscopy of stools.

It is important to remember that a patient can have an amoebic abscess of the liver without having had symptoms of dysentery. Cysts of *Entamoeba histolytica* are often absent from the stools in such cases.

The eggs of *Schistosoma haematobium* can usually be seen in the urine of patients with this infestation.

**Bacteriology**

Blood cultures are the most reliable method for diagnosing enteric fever, although they may not be positive until the third week of the illness, and may be negative when the patient has received partial treatment for typhoid fever. *Salmonella typhi* can also be cultured from aspirates of bone marrow, and may be positive when nothing can be grown from blood cultures.

Stool samples sent to a bacteriological laboratory will always be cultured for *Salmonella* sp., *Shigella* sp. and *Campylobacter* sp.; that is not the case for *Vibrio* sp. In the unlikely event of cholera being suspected, that diagnosis must be written on the request form. The same applies to diphtheria, as throat swabs are no longer cultured as a matter of routine for *C. diphtheriae*. If oropharyngeal or the much rarer cutaneous diphtheria is suspected, this diagnosis must be written on the request form.

**Biopsies**

Histological examination and culture of a skin biopsy is used to diagnose leishmaniasis and uncommon infections such as the cutaneous mycoses. Rectal biopsies are also used to diagnose schistosomiasis. Such procedures are best left to experts in tropical diseases.

**CONCLUSION**

The likelihood of a GP seeing a ‘tropical disease’ is increasing, especially if they are working in areas with a large immigrant population. Advice on the diagnosis and management can always be obtained by speaking to the registrar on call at an infectious diseases unit.

**FURTHER READING**