

Fever and rash

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Abstract

The syndrome of fever and rash in the returning traveller presents a diagnostic challenge that requires a thorough history with special attention to travel and exposures alongside physical examination to distinguish between infectious and non-infectious causes. The most common febrile illnesses that present with a rash in the returning traveller are arboviral infections (dengue, Chikungunya, Zika) and tick-borne infections (rickettsioses).

Keywords Chikungunya; dengue; fever; MRCP; rash; rickettsiae; travel; Zika

Introduction

Fever and rash is a relatively common presentation in travellers returning from the tropics. The presence of a rash as part of a febrile illness, although rarely pathognomonic, focuses the differential diagnosis. It is important to remember that rashes are common and can be caused by medical conditions or drug reactions unrelated to travel. A systematic approach is important, as a rash can be either a manifestation of a mild illness or an indicator of a potentially fatal contagious disease.

Fever and rash in the returning traveller

Common febrile illnesses presenting with rash in the returning traveller are arboviral infections (dengue, Chikungunya, Zika) and tick-borne diseases (rickettsioses). Infectious mononucleosis (Epstein–Barr virus, cytomegalovirus), measles, mumps and rubella, and sexually transmitted infections, especially HIV seroconversion and secondary syphilis, are important differential diagnoses. Katayama syndrome (acute schistosomiasis) can present with an urticarial rash 4–6 weeks after freshwater exposure in Africa. Although malaria is one of the most common causes of febrile illness reported in travellers returning from tropical and subtropical regions, the presence of a rash is unusual.

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Key points

- Although it is important to exclude malaria in patients returning with fever from an endemic area, the presence of a rash is unusual
- Accurate travel history and timing of exposure are important in allowing prompt diagnosis and early management of many travel-related infections
- Rickettsial infections should be considered in the differential diagnosis of fever and rash in the returned traveller because of significant mortality if left untreated
- Present and future pregnancy should be considered in individuals travelling to and from Zika endemic regions

Diagnosis

Initial assessment

A preliminary assessment should focus on two broad considerations:

- Does this patient show signs of sepsis (life-threatening organ dysfunction caused by a deregulated host response to infection) or septic shock (a subset of sepsis with persisting hypotension requiring vasopressors to maintain mean arterial pressure at ≥ 65 mmHg, and with serum lactate concentration >2 mmol/litre despite adequate volume resuscitation) requiring intensive care support and antibiotic therapy?
- Does the travel history indicate exposure to pathogens causing serious illness with risk of nosocomial transmission that require immediate isolation and barrier precautions (e.g. viral haemorrhagic fevers)?

History

Rash can be associated with tropical and cosmopolitan infections (Table 1). A detailed history is essential and should include the following:

- Timing of the onset of illness related to travel, which provides an estimate of the incubation period of potential tropical infections.
- Distribution of rash, which can provide important clues (see Diagnostic approach to tropical skin infections ppXXX).
- Detailed travel history, including dates of departure and return, urban, rural or tropical travel, accommodation used, activities undertaken and potential exposures, with clear timings in relation to onset of illness.
- Exposure to vector-borne infections, including exposure to specific vectors such as mosquitoes, ticks, fleas and mites. Often ticks and mites are not seen while attached, but a history of walking in rural or wilderness areas indicates potential exposure.
- Exposure to zoonoses, requiring questioning about direct animal contact and indirect exposure, for example to fresh water for leptospirosis.

Causes of rash and fever — tropical and cosmopolitan infections

Organism/disease	Rash (% cases)	Distribution	Vector/exposure risk	Associated features
Dengue	M, MP, PP (50%)	Tropical, subtropical, worldwide	<i>Aedes</i> mosquito, urban and rural	Myalgia, haemorrhage, shock
Zika	MP	Africa, Asia, Oceania, Latin America, North America	<i>Aedes</i> mosquito, urban and rural, MTC, sexual, blood transfusion	Congenital Zika virus syndrome, Guillain–Barré syndrome
Chikungunya	M, MP (50%)	Tropical, subtropical Africa and Asia, Caribbean, South America	<i>Aedes</i> mosquito, urban and rural	Polyarthralgia, arthritis
African tick typhus	MP, PP, V (46%)	Sub-Saharan Africa	Ticks rural/wilderness	Eschar common, headache
Mediterranean spotted fever	MP, PP (90%)	Mediterranean and sub-Saharan Africa, India	Ticks, urban, suburban	Eschar common
Rocky Mountain spotted fever	MP, PP (90%)	USA, Central and South America	Ticks, rural/wilderness	Eschar rare
Scrub typhus — <i>Orientia tsutsugamushi</i>	M, MP (35–90%)	Asia, Pacific Islands	Larvae trombiculid mites (chiggers), rural	Eschar common
Typhoid fever — <i>Salmonella typhi/paratyphi</i>	M (rose spots) (20%)	Wherever risk of faecal contamination of water	Faecal–oral, poor sanitation	Prolonged fever, splenomegaly GI perforation and haemorrhage, encephalopathy
Leptospirosis	M, MP, PP (20%)	Worldwide	Exposure to rat/rodent urine (fresh water)	Conjunctivitis, myalgia, jaundice
Schistosomiasis	U (Katayama fever)	Africa, Asia, South America, Caribbean	Freshwater snails	Eosinophilia, pulmonary infiltrates
Yellow fever	PP	Central and South America, Africa	Mosquito-borne urban/rural	Jaundice, neurological involvement
Lassa fever	MP, PP	West Africa	Rodent urine, rural	Pharyngitis, retrosternal pain, encephalitis, haemorrhage
Ebola/Marburg	MP, PP	West/Central Africa	Unknown, ?monkeys/bats, rural/wilderness	Abdominal pain, diarrhoea and vomiting, haemorrhage
South American haemorrhagic fevers	PP	South America		
West Nile virus	MP	Africa, USA	<i>Culex</i> , <i>Aedes</i> mosquitoes, urban	Encephalitis
Measles	MP	Worldwide	Human	Cough, conjunctivitis, Koplik's spots
Varicella–zoster virus	MP, V	Worldwide	Human	Coryza, pneumonitis
Epstein–Barr virus	MP, PP	Worldwide	Human	Pharyngitis, lymphadenopathy, splenomegaly
Cytomegalovirus	MP	Worldwide	Human	Pharyngitis, lymphadenopathy, splenomegaly
Toxoplasmosis	MP	Worldwide	Cats	Lymphadenopathy
HIV	MP	Worldwide	Sexual, IVDU, vertical transmission	Pharyngitis, lymphadenopathy, splenomegaly
Rubella	MP	Worldwide	Human	Coryza, arthralgia
<i>Staphylococcus aureus</i>	PP, E	Worldwide	Human, IVDU	Shock, heart murmur
<i>Streptococcus pyogenes</i>	E	Worldwide	Human	Pharyngitis, cellulitis, shock
<i>Neisseria meningitidis</i>	PP	Worldwide	Human	Shock, meningitis
<i>Neisseria gonorrhoeae</i>	PP	Worldwide	Sexual	Septic arthritis
Syphilis, <i>Treponema pallidum</i>	MP, PP, PU, V	Worldwide	Sexual	Genital ulceration

The % values given for frequency of rash in particular infections are derived from case series.

E, erythrodermic; GI, gastrointestinal; IVDU, intravenous drug use; M, macular; MP, maculopapular; MTC, mother-to-child; PP, petechial/purpuric; PU, pustular; U, urticarial; V, vesicular.

Table 1

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