RICKETTSIAL INFECTION

Disease Overview

Rickettsial infections are generally caused by species of *Rickettsia*, a genus of obligate intracellular bacteria. Although they are widely distributed throughout the world, the species and associated human clinical diseases vary depending on the geographical locations. Rickettsial infections found in North America include anaplasmosis, ehrlichiosis, Rocky Mountain spotted fever, and typhus fever.

Rickettsial infections can be classified into three main groups: the spotted fever group, the typhus group, and other types of Rickettsiosis.

Symptoms

Symptoms vary with the causative agent. Common symptoms include fever, headache, malaise, rash, nausea, and vomiting. Many rickettsial infections are accompanied by a rash at the site of the bite. Although most infections cause moderate illness, serious illness can develop.

Reservoir

Maintained by a variety of tick species and wildlife hosts (small mammals such as rodents, reptiles, deer, ruminants), as well as domestic animals such as cats and dogs.

Mode of Transmission

Most rickettsial infections are transmitted by bites from ticks, but can also be from fleas, lice, and mites.

For some organisms, transmission can occur by inhaling, inoculating the conjunctiva with infectious material, transfusion or organ transplantation.

Incubation Period

Usually 2 to 21 days for most causative agents.

Period of Communicability

Not normally transmitted from person to person.

Risk Factors

Increased risk for persons acquiring and/or severe illness:

- Travellers to endemic areas
- Outdoor activities in spring and summer months when ticks are most active

Surveillance Case Definition

Confirmed case

Clinically compatible symptoms and laboratory confirmation of a **rickettsial infection** by either:

- Detection via polymerase chain reaction (PCR) assay,

OR

- Fourfold or greater increase in antibody by indirect immunofluorescence assay between paired acute- and convalescent-phase serum specimens obtained at least 2-4 weeks apart.

Table Classification, primary vector, and reservoir occurrence of rickettsiae known to cause disease in humans

GROUP	DISEASE	SPECIES	VECTOR	GEOGRAPHIC DISTRIBUTION
Anaplasma	Human anaplasmosis	*Anaplasma phagocytophilum*	Tick	Primarily United States, worldwide
Ehrlichia	Human ehrlichosis	*Ehrlichia chaffeensis* *E. muris* *E. ewingii*	Tick	Common in United States, possibly worldwide
Neoehrlichia	Human neoehrlichiosis	*Neoehrlichia mikurensis*	Tick	Europe, Asia
Neorickettsia	Sennetsu fever	*Neorickettsia sennetsu*	Trematode	Japan, Malaysia, possibly other parts of Asia
Scrub typhus	Scrub typhus	*Orientia tsutsugamushi*	Larval mite (chigger)	Asia-Pacific region from maritime Russia and China to Indonesia and North Australia to Afghanistan
Spotted fever	Rickettsiosis	*Rickettsia aeschlimanni-nii*	Tick	South Africa, Morocco, Mediterranean littoral
	African tick-bite fever	*R. africae*	Tick	Sub-Saharan Africa, West Indies
	Rickettsialpox	*R. akari*	Mite	Countries of the former Soviet Union, South Africa, Korea, Turkey, Balkan countries, North and South America
	Queensland tick typhus	*R. australis*	Tick	Australia, Tasmania
	Mediterranean spotted fever or Boutonneuse fever	*R. conorii*[1]	Tick	Southern Europe, southern and western Asia, Africa, India
	Cat flea rickettsiosis	*R. felis*	Flea	Europe, North and South America, Africa, Asia
	Far Eastern spotted fever	*R. heilong-jiangensis*	Tick	Far East of Russia, Northern China, eastern Asia
	Aneruptive fever	*R. helvetica*	Tick	Central and northern Europe, Asia
	Flinders Island spotted fever, Thai tick typhus	*R. honei*, including strain "marmionii"	Tick	Australia, Thailand
	Japanese spotted fever	*R. japonica*	Tick	Japan
	Mediterranean spotted fever-like disease	*R. massiliae*	Tick	France, Greece, Spain, Portugal, Switzerland, Siciliy, central Africa, and Mali
	Mediterranean spotted fever-like illness	*R. monacensis*	Tick	Europe, North Africa
	Maculatum infection	*R. parkeri*	Tick	North and South America
	Tickborne lymphadenopathy, *Dermcentor*-borne necrosis and lymphadenopathy	*R. raoultii*	Tick	Europe, Asia
	Rocky Mountain spotted fever, Brazilian spotted fever, febre maculosa, São Paulo exanthematic typhus, Minas Gerais exanthematic typhus	*R. rickettsii*	Tick	North, Central, and South America
	North Asian tick typhus, Siberian tick typhus	*R. sibirica*	Tick	Russia, China, Mongolia
	Lymphangitis-associated rickettsiosis	*R. sibiricamongolotimonae*	Tick	Southern France, Portugal, China, Africa
	Tickborne lymphaden-opathy (TIBOLA),*Dermacentor*-borne necrosis and lymphaden-opathy (DEBONEL)	*R. slovaca*	Tick	Southern and eastern Europe, Asia
Typhus fever	Epidemic typhus, sylvatic typhus	*R. prowazekii*	Human body louse	Central Africa, Asia, Central, North, and South America

Reference: 2016 CDC Health Information for International Travel Rickettsial (Spotted & Typhus Fevers) & Related Infections (Anaplasmosis & Ehrlichiosis)

Diagnosis and Laboratory Guidelines

National Microbiology Laboratory. Detection using polymerase chain reaction or serological diagnosis by detection of antibodies using indirect immunofluorescence assay (turnaround time 15 days).

Reporting

Per Policy 2.2 Disease and Event notification to OCMOH and Disease and Event Reporting section

- Routine Surveillance (RDSS) for all confirmed cases

Case Management

Education

Case or relevant caregiver should be informed about:

- Nature of infection, length of communicable period, mode of transmission and disease ecology
- Tick bite prevention

Investigation

Consider history of travel and possible exposure to ticks, lice, fleas or mites.

Clusters may occur due to proximity to tick populations.

Exclusion/Social Distancing

Not applicable

Treatment

Appropriate antimicrobial agents.

Immunization

Not applicable

Contact Management

Education

Per case management

Investigation

Per case management

Exclusion/Social Distancing

Not applicable

Prophylaxis

Not applicable

Outbreak Management

Activate the local outbreak plan when an outbreak is declared.