

TABLE 211-1 FEATURES OF SELECTED RICKETTSIAL INFECTIONS

Disease	Organism	Transmission	Geographic Range	Incubation Period, Days	Duration, Days	Rash, %	Eschar, %	Lymphadenopathy ^a
Rocky Mountain spotted fever	<i>Rickettsia rickettsii</i>	Tick bite: <i>Dermacentor andersoni</i> , <i>D. variabilis</i> , <i>Amblyomma cajennense</i> , <i>A. aureolatum</i> , <i>Rhipicephalus sanguineus</i>	United States Central/South America Mexico, Brazil, United States	2–14	10–20	90	<1	+
Mediterranean spotted fever	<i>R. conorii</i>	Tick bite: <i>R. sanguineus</i> , <i>Rhipicephalus pumilio</i>	Southern Europe, Africa, Middle East, Central Asia	5–7	7–14	97	50	+
African tick-bite fever	<i>R. africae</i>	Tick bite: <i>A. hebraeum</i> , <i>A. variegatum</i>	Sub-Saharan Africa, West Indies	4–10	4–19	50	90	++++
Maculatum disease	<i>R. parkeri</i>	Tick bite: <i>A. maculatum</i>	United States, South America	2–10	6–16	88	94	++
Rickettsialpox	<i>R. akari</i>	Mite bite: <i>Liponyssoides sanguineus</i>	United States, Ukraine, Turkey, Mexico, Croatia	10–17	3–11	100	90	+++
Tick-borne lymphadenopathy	<i>R. slovaca</i>	Tick bite: <i>D. marginatus</i> , <i>D. reticularis</i>	Europe	7–9	17–180	5	100	++++
Flea-borne spotted fever	<i>R. felis</i>	Flea (mechanism undetermined): <i>Ctenocephalides felis</i>	Worldwide	8–16	8–16	80	15	—
Epidemic typhus	<i>R. prowazekii</i>	Louse feces: <i>Pediculus humanus corporis</i> , fleas and lice of flying squirrels, or recrudescence	Worldwide	7–14	10–18	80	None	—
Murine typhus	<i>R. typhi</i>	Flea feces: <i>Xenopsylla cheopis</i> , <i>C. felis</i> , others	Worldwide	8–16	9–18	80	None	—
Human monocytotropic ehrlichiosis	<i>Ehrlichia chaffeensis</i>	Tick bite: <i>A. americanum</i> , <i>D. variabilis</i>	United States	1–21	3–21	26	None	++
Ewingii ehrlichiosis	<i>E. ewingii</i>	Tick bite: <i>A. americanum</i>	United States	1–21	4–21	0	None	—
Unnamed ehrlichiosis	<i>E. muris</i> -like agent	Tick bite: <i>Ixodes scapularis</i>	United States	Unknown	3–14	None	None	—
Human granulocytotropic anaplasmosis	<i>Anaplasma phagocytophilum</i>	Tick bite: <i>I. scapularis</i> , <i>I. ricinus</i> , <i>I. pacificus</i> , <i>I. persulcatus</i>	United States, Europe, Asia	4–8	3–14	Rare	None	—
Unnamed disease	<i>Candidatus Neoehrlichia mikurensis</i>	Tick bite: <i>I. ricinus</i> , <i>I. persulcatus</i> , <i>Haemaphysalis concinna</i>	Europe, China	≥8	11–75	10	None	—
Scrub typhus	<i>Orientia tsutsugamushi</i>	Mite bite: <i>Leptotrombidium deliense</i> , others	Asia, Australia, Pacific and Indian Ocean islands	9–18	6–21	50	35	+++
Q fever	<i>Coxiella burnetii</i>	Inhalation of aerosols of infected parturition material (goats, sheep, cattle, cats, others), ingestion of infected milk or milk products	Worldwide except New Zealand, Antarctica	3–30	5–57	<1	None	—

^a++++, severe; +++, marked; ++, moderate; +, present in a small proportion of cases; —, not a noted feature.

The rickettsiae spread lymphohematogenously throughout the body and infect numerous foci of contiguous endothelial cells. The dose-dependent incubation period is ~1 week (range, 2–14 days). Occlusive thrombosis and ischemic necrosis are not the fundamental pathologic bases for tissue and organ injury. Instead, increased vascular permeability, with resulting edema, hypovolemia, and ischemia, is responsible. Consumption of platelets results in thrombocytopenia in 32–52% of patients, but disseminated intravascular coagulation with hypofibrinogenemia is rare. Activation of platelets, generation of thrombin, and activation of the fibrinolytic system all appear to be homeostatic physiologic responses to endothelial injury.

Clinical Manifestations Early in the illness, when medical attention usually is first sought, RMSF is difficult to distinguish from many self-limiting viral illnesses. Fever, headache, malaise, myalgia, nausea, vomiting, and anorexia are the most common symptoms during the first 3 days. The patient becomes progressively more ill as vascular infection and injury advance. In one large series, only one-third of patients were diagnosed with presumptive RMSF early in the clinical

course and treated appropriately as outpatients. In the tertiary-care setting, RMSF is all too often recognized only when late severe manifestations, developing at the end of the first week or during the second week of illness in patients without appropriate treatment, prompt return to a physician or hospital and admission to an intensive care unit.

The progressive nature of the infection is clearly manifested in the skin. Rash is evident in only 14% of patients on the first day of illness and in only 49% during the first 3 days. Macules (1–5 mm) appear first on the wrists and ankles and then on the remainder of the extremities and the trunk. Later, more severe vascular damage results in frank hemorrhage at the center of the maculopapule, producing a petechia that does not disappear upon compression (Fig. 211-1). This sequence of events is sometimes delayed or aborted by effective treatment. However, the rash is a variable manifestation, appearing on day 6 or later in 20% of cases and not appearing at all in 9–16% of cases. Petechiae occur in 41–59% of cases, appearing on or after day 6 in 74% of cases that manifest a rash. Involvement of the palms and soles, often considered diagnostically important, usually develops relatively late in