

RICKETTSIAE

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outline

- Introduction
- Rickettsiae species and infection /disease
- Mode of transmission
- Epidemiology
- General pathogenesis
- Symptoms
- Diagnosis
- Prevention
- Treatment

Introduction

- **Rickettsiae** belongs to the family **Rickettsiaceae**
- They are non- motile Gram-negative, obligate intracellular bacteria organisms that survive within membrane-bound vacuoles
- They are distinguished by short, nonflagellated, rod shaped coccibacilli ranging from 0.8 to 2.0 μm in length and from 0.3-0.5 μm in width
- They are characterized by a five layered outer envelope surrounded by lipopolysaccharides
- Parasites of arthropods- fleas, lice, ticks and mites
- No human to human transmission

Classification of Rickettsia

- Rickettsia is divided into several groups however the typhus group and spotted fever group has species that are pathogenic to humans. Others are Scrub Typhus (*Orientia* spp.)
- Typhus fever group: Epidemic Typhus(*R. prowazeki*)
Endemic Typhus or murine typhus(*R. typhi*)
- Spotted Fever Group
- Scrub Typhus group

Rickettsial Species and diseases

- *Rickettsia africae* - African tick- bite fever
- *R. conorii* - Mediterranean spotted fever.
- *R. Australia* - Australian tick typhus (ticks)
- *R. akari* - Rickettsial pox.(mites)
- *R. siberica* - Siberian tick typhus (ticks)
- *R. rickettsii* - Rocky mountain spotted fever / brazilian spotted fever.(ticks)
- *R. typhi* - murine typhus, endemic typhus(Rat flea)
- *R. prowazekii* - Epidemic typhus Brill- Zensser disease(Human body louse)

Some Rickettsiae species and infection

- Typhus group: These consist of flea associated rickettsioses caused by *R. typhi* and *R. felis*. They are globally distributed particularly in and around port cities and coastal regions with large rodent populations. Humans exposed by flea infested cats, dogs, and peridomestic animals while travelling in endemic regions are at most risk. Epidemic typhus (caused by *R. prowazekii*), murine typhus and louseborne epidemic typhus are all associated with this group.
- Scrub typhus group: transmitted by mites. Encountered in high grass and bush .

- Spotted fever group : most frequently reported travel associated rickettsial infections. The causative agent is rickettsiapox, *R. akari* transmitted by house mouse mites. Outbreaks of rickettsialpox occurs most often after contact with infected peridomestic rodents and their mites

Mode of transmission

- They are transmitted by bites or infectious fluid (such as feces) inoculated into the skins from ectoparasites such as fleas, lice, mites and ticks.
- Inhaling bacteria or inoculating conjunctiva with infectious material.
- Transfusion of infected blood products or by organ transplantation. It is rare but has been reported.
- No human to human transmission

Epidemiology

- All travelers are at risks of acquiring rickettsiae.
- Transmission occurs throughout the year but it is increased during outdoor activities

General pathogenesis

- Rickettsiae are transmitted to humans by the bite of an infected arthropod vector.
- Multiply at the site of entry and enter the blood stream.
- Localise in the vascular endothelial cells and multiply to cause thrombosis lead to rupture

Diagnosis

- Clinical recognition.
- Epidemiological context.
- Serological testing.
- PCR

Treatment

- Immediate empiric treatment with tetracycline is recommended for all ages, most commonly doxycycline.
- Chloramphenicol should be alternative in most cases.
- In areas where tetracycline -resistant scrub typhus has been reported, azithromycin may be an infective alternative.
- Rifampin may be an alternative drug for some pregnant or doxycycline-intolerance patients

Prevention

- Minimize exposure to infectious arthropods or animal reservoirs (particularly dogs) during travelling when travelling to endemic areas.
- Proper use of insect and ticks repellents on skin or clothing
- Self examination after visit to vector-infected/endemic areas.
- Wearing protective clothings.
- No vaccine is available for preventing rickettsial