

RICKETTSIAE

Classification

Family: Rickettsiaceae

Genera: Rickettsia

Orientia

Ehrlichia

Anaplasma

Coxiella

Bartonella

General characteristics

- have typical gram-negative cell walls (do not stain well with Gram stain)
- Aerobic
- Stained by **Giemsa** -take on a characteristic red colour
- **Obligate intracellular bacteria**

Transmission

- Cause **Zoonoses**
- Emerging and re-emerging infections
- Natural hosts are **mammals** and **arthropods**
- transmitted to humans by arthropods (**fleas, lice, mites, and ticks**) during feeding
- reservoir animals include dogs, mice, rats, and flying squirrels

Transmission

- Transmission occurs by:
 - Bite from the arthropods
 - inoculating infectious fluids/feces into the skin/conjunctiva
 - Inhaling dust or **inoculating** conjunctiva with infectious material
 - **transfusion or organ transplantation** - rare but has been reported.

Epidemiology

- Widely distributed globally, in **endemic** regions, with **sporadic** and often **seasonal** outbreaks.
- Travellers at risk
- Transmission is increased during outdoor activities during summer
- Infection can occur **throughout the year**

- Read pathogenesis and pathophysiology of rickettsia

Classification

Classified into:

1. Spotted Fever Group(SFG) rickettsia
2. Typhus group(TG)rickettsia

Spotted Fever Group(SFG)

1. Rocky Mountain spotted fever (RMSF), caused by *Rickettsia rickettsii*
2. Rickettsialpox, caused by *Rickettsia akari*
3. Boutonneuse fever (ie, Kenya tick typhus, African tick typhus, Mediterranean spotted fever, Indian tick typhus) caused by *Rickettsia conorii* and transmitted by dog tick

**** **African tick-bite fever** is the most frequently reported travel-associated rickettsiosis

Typhus group

1. Epidemic typhus caused by *Rickettsia prowazekii*- transmitted by lice
2. Murine (endemic or flea-borne) typhus caused by *Rickettsia typhi*

Clinical Manifestations

Spotted Fever

- Onset 2-4 days after infective bite
- Fever, severe headache, muscle pain and rash.
- Rash typically appears on ankles and wrists.
- Complications: partial paralysis of lower limbs; gangrene

Clinical manifestations

Typhus Fever

- Fever,
- Chills,
- Headache,
- Myalgia,
- Macules which appear on the trunk then to the extremities,
- Conjunctival injection

Treatment

- Doxycycline
- Chloramphenicol



Prevention and Control

- Limiting exposure to ticks
- Tick control
- No vaccine available

ORIENTIA

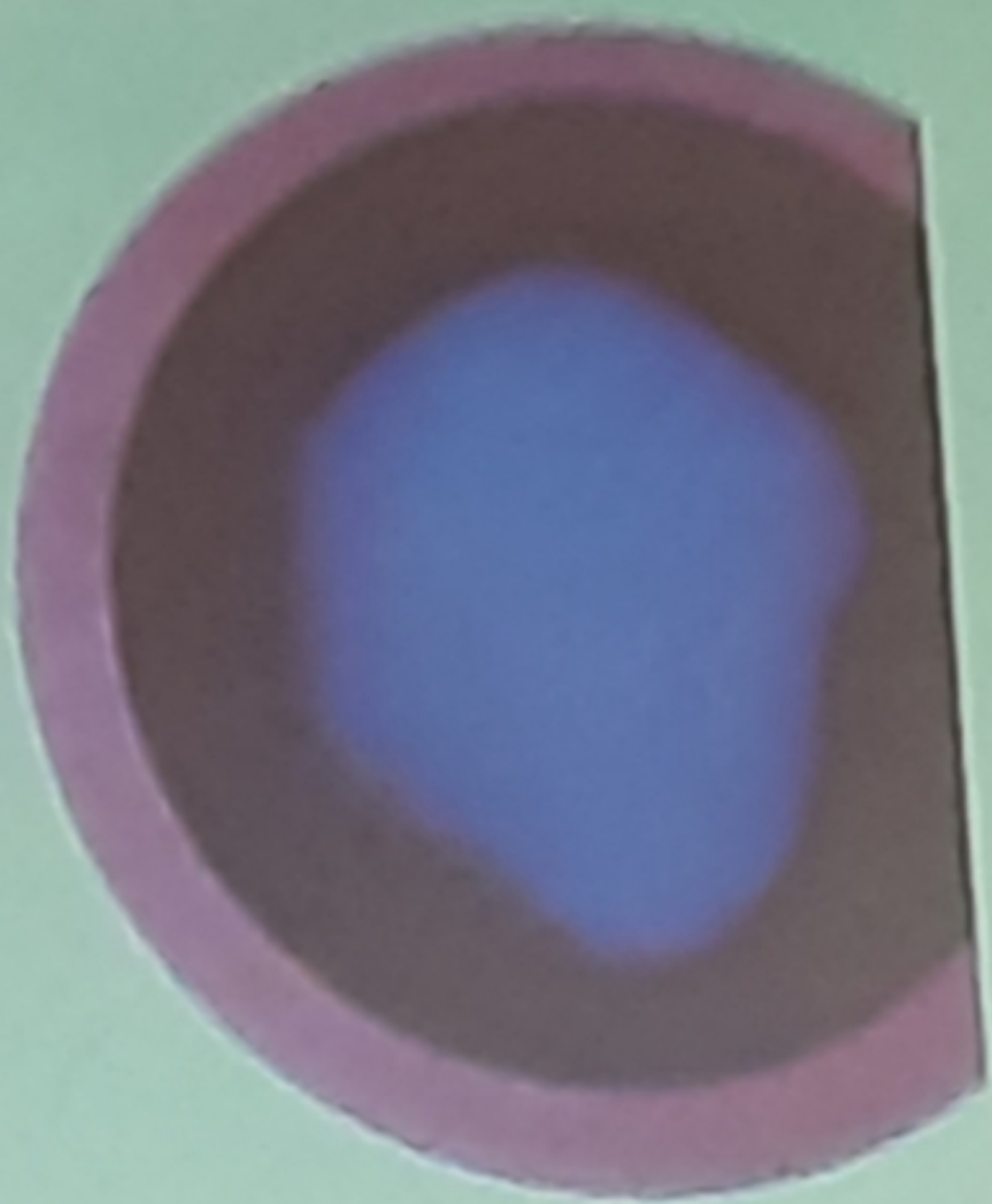
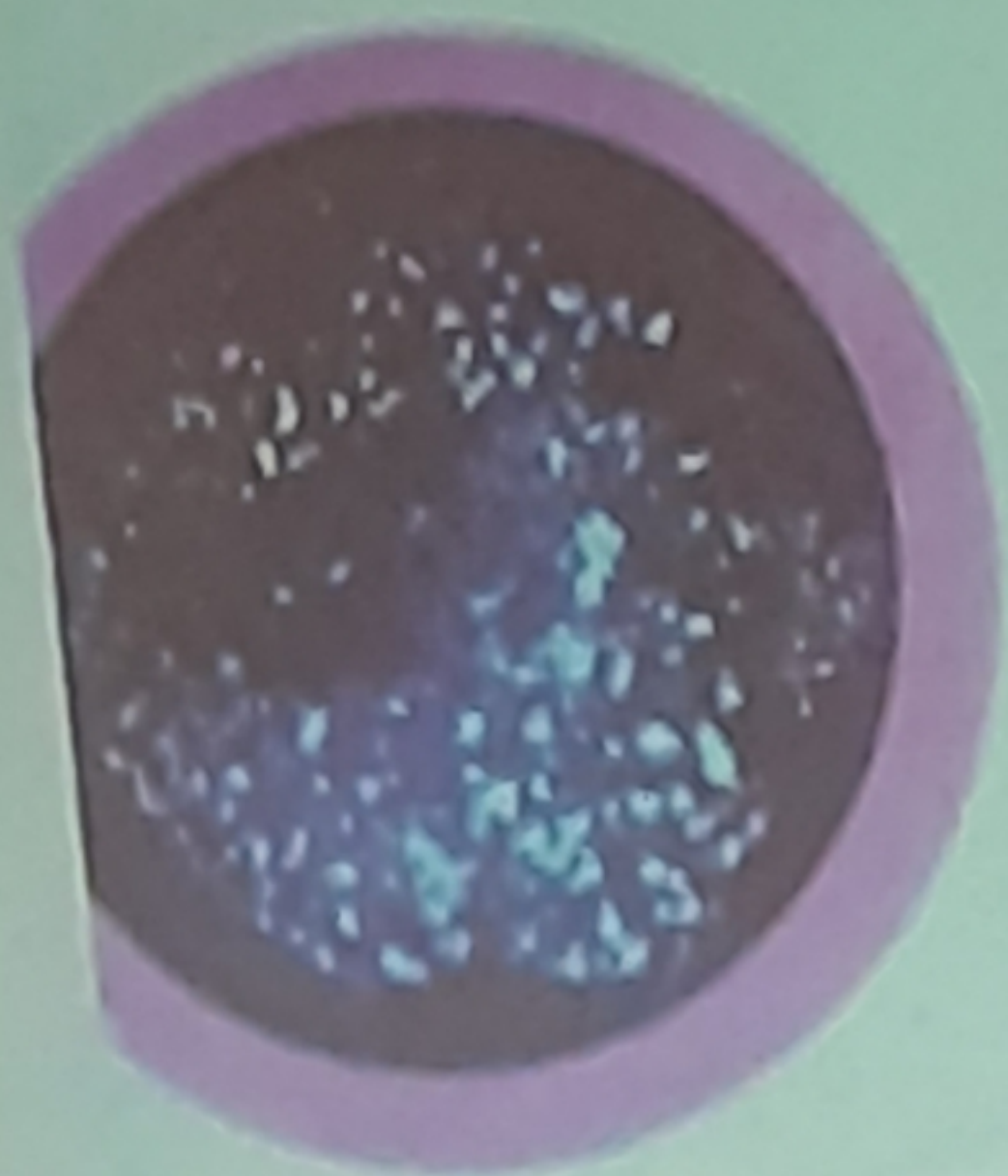
Orientia tsutsugamushi

- Causes **scrub typhus**, an acute febrile illness
- Also known as tsutsugamushi disease
- Transmitted to humans by the bite of mites(**chiggers**)

Clinical manifestations

- Illness varies from mild and self-limiting to fatal
- Incubation period of 6-21 days
- Fever, headache, myalgia, cough, and gastrointestinal symptoms
- Primary papular lesion → flat black eschar.
- Associated with regional and generalized lymphadenopathy

- hemorrhaging and intravascular coagulation
- splenomegaly and lymphadenopathies are typical signs
- If untreated, meningoencephalitis develops



Treatment

- Doxycycline OR tetracycline
- Chloramphenical

Prevention

- Protective clothing
- Insect repellants
- Avoid sitting or lying on bare ground or grass
- Clearing of vegetation and chemical treatment of soil

COXIELLA

Coxiella burnetii

- Obligate intracellular bacteria that live inside acidic lysosomes
- Causes Q- fever
- No vector is involved

Epidemiology

- Various hosts:
 - mammals, birds, numerous different genera of ticks.
 - Farm animals are the primary reservoirs for human disease
- Excreted in urine, milk, faeces, and birth products
- Birth products containing high numbers of bacteria

Epidemiology

- Human infection occurs after
 - Inhalation
 - Contact with contaminated animal products
 - Exposure to placenta of an infected woman
 - Blood transfusion.
- Due to its high infectivity and low infective dose, has been used as an agent of bioterrorism

Clinical Manifestations

- Can be acute or chronic

Acute disease:

- Long incubation period- average 20 days
- Sudden onset of severe headache, high fever, chills, myalgia.
- Respiratory symptoms are generally mild
- Hepatosplenomegaly present in \approx half of cases

Clinical Manifestations

Chronic disease:

- Most common presentation is **infective endocarditis**, generally on a prosthetic or previously damaged heart valve

Treatment

Treatment

- Tetracyclines or doxycycline

Further reading

- Bartonella
- Ehrlichia
- Anaplasma