

Rickettsiae

Species of rickettsia can be categorized into 2 groups

1 Typhus group

2 Spotted fever group

Antigenic structure-similar to gram negative bacteria

Species specific outer membrane proteins highly immunogenic

Group specific Lipopolysaccharide antigen

Pathogenesis-

Transmitted by arthropod vectors

Tick and mite borne by biting

Louse and flea by autoinoculation and aerosol

Transovarial

Spread-spread through lymphatics, multiply in regional lymph nodes and then spread by blood stream

Target sites-endothelial cells and monocytes

Phagocytosis-Adhesion to endothelial cells mediated by outer membrane protein after which they are phagocytosed

After phagocytosis rickettsiae remain inside vacuole and after lyses of vacuole found free in cytoplasm

Multiply by binary fission

Cell to cell spread by actin polymerization in spotted fever rickettsiae in contrast others accumulate in cell until lysis of cell take place

They are obligate intracellular parasites

They cause endothelial cell injury

Once released from host cells they die quickly

Typhus group-

R. prowazeki, *R. typhi*, *R. rickettsii*

Spotted fever group-

R. conori, *R. akari*, *R. africae*

Epidemic typhus (Louse borne)

Caused by *R. prowazeki*

Vector human body louse *pediculus humanus corporis*

Transmitted by autoinoculation or by inhalation of louse feces

Clinical features-

rash, myalgia, confusion, interstitial pneumonitis

Geographical distribution-africa,south america

Brill zinsser disease is recrudescent illness in
R.prowazeki

-Endemic typhus(Flea borne)

Caused by R.typhi

Vector is rat flea

Mode of transmission by inoculation

Symptoms include fever,headache,myalgia,rash

Endemic worldwide and in INDIA present in
kashmir,shimla pune

-Rocky mountain spotted fever(RMSF)

Caused by *R.rickettsiae*

Vector *dermacentor andersoni*, *amblyomma*

Transmitted by infected tick bite

Clinical features includes fever rash headache
myalgia

Present in USA, central and south america

-Indian tick typhus

Caused by *R.conorii*

Transmitted by tick bite *Rhipicephalus*

Eschar observed at the site of bite in 50% cases

Rest similar to RMS fever

Prevalent in europe,south asia and africa

-Rickettsial pox

Caused by R. akari

Transmitted by bite of infected mite

Liponyssoides

Vesicular rashes and eschar seen with
lymphadenopathy

Endemic in USA, Ukraine, Turkey and Mexico

Lab diagnosis-

Antibody detection-Non specific test weil felix test in which rickettsial antibodies detected against proteus ox19,ox 2 and ox K antigen

In epidemic and endemic typhus-ox 19 antibody raised

In tick borne spotted fever ox 19 and ox 2 antibodies raised

Specific antibody detection by Indirect IF,LAT,CFT
ELISA

-Histopathological examination

Isolation from cell lines,egg or animal

Neil mooser reaction

PCR detecting outer membrane protein genes

Or 16s rRNA

Treatment by doxycycline or chloramphenicol