

# Rickettesial and related intracellular bacterial infection

## Rickettesial fevers

Bacteriology : *Rickettesiae* are Gram 's negative bacteria non spore forming it is obligatory intracellular cannot live outside the cells it is considered bacteria recently. It parasitize the intestinal canal of ticks ,fleas or lice ,when these arthropods bite human skin it excreted with its stool or through saliva when human itch his skin it enter to human body and disease begins . Rickettesial fevers classified into spotted fever group and typhus group .

## Pathogenesis

Rickettesia are obligatory intracellular when it inter human body it multiply inside endothelium of capillaries ,immune reaction against Rickettesia will start lead to inflammation of capillaries lead to local thrombosis and bleeding in any organ affected like brain ,heart ,lungs ,liver kidneys ,skin ....etc . The site of entry of skin is black necrotic crusted sore due to thrombosis of the capillary of the skin ( vasculitis ) called Escher with regional lymphadenopathy .

## Clinical feature of rickettsial fever

### A- Spotted fever group

- 1- Rocky mountain spotted fever : it is caused by *Rickettsia Rickettsii* ,it transmitted by ticks bite ,rodents and dogs . It is common in America . Its incubation period are 7 days . Eschar is present with fever and cutaneous rash which is usually morbilliform or maculopapular rash start in periphery of limbs then extend to trunk least at abdomen after 48 hours the patients develop wide spread cutaneous haemorrhage with hepatosplenomegally and then the condition may be fatal . Mortality rate about 2-12 % .
- 2- Boutonneuse fever : It is caused by *Rickettsia conorii* it transmitted to human by ticks but can be transmitted also by dogs and rodents . Common in Africa ,Asia and India subcontinent . It has similar features fever and maculopapular rash in limbs and less in trunk then haemorrhage, mortality rate 2.5% .
- 3- Other spotted fevers : Siberian tick typhus caused by *R. siberica* ,transmitted by ticks ,rodents ,domestic animals common in Siberia ,Mongolia and china . Oriental spotted fever caused by *R. japonica* common in Japan , ....etc .

## B- Typhus group

- 1- Scrub typhus fever : It is caused by *Rickettsia tsutsugamushi* . It transmitted by mites and rats . Common in far east Asia like Myanmar , Pakistan , Bangladesh .  
Incubation period : 9 days . It presented with eschar may be multiple surrounded by cellulites and regional lymphadenopathy , associated with fever , headache , retro-orbital pain , malaise , prostration then generalized erythematous maculopapular rash usually appear in the 7<sup>th</sup> day in most of the body including palms and sole with the face and disappear in the 14<sup>th</sup> day , the fever is remittent fever and disappear in the 12<sup>th</sup> -18<sup>th</sup> day slowly with persistent tachycardia for weeks . Mortality rate is low , subclinical conditions are common .
  
- 2- Epidemic typhus (Louse borne) : It is caused by *R. prowazekii* . It transmitted by infected faeces of human body lice when scratching the skin . Incubation period 12-14 days . The disease are common in overcrowding people especially in time of wars so it can occur all over war many epidemics occur all over the world .  
The clinical features occur all of sudden with fever , headache , malais , backache , arthralgia , the eyes are congested the face is flushed and cyanotic , the patient is confused . In the 4<sup>th</sup> -6<sup>th</sup> day rash appear all over the body (maculopapular) then it became haemorrhagic rash of petchi and purpuric in the forearm , axilli and trunk except head and neck . In the second weeks the patient has sore lips , the tongue is dry, tremulous and pale , the pulse is week , small in volume at the end of second week the patient either die from cardiac or renal failure or temperature reduce rapidly and improve gradually . Mortality rate 40% .
  
- 3- Endemic typhus (flea born ) : It caused by *R. typhi* . It transmitted to human by infected faeces of fleas whom bite on infected rats . Incubation period 8-14 days . It is common worldwide . The clinical features are similar to epidemic typhus but rash is less in severity . Mortality rate is rare .

Differential diagnosis :

Malaria should be excluded , viral hepatitis and haemorrhagic fever , meningococcal sepsis .

## Investigations

Thrombocytopenia and elevated liver enzymes . Anti-rickettsial antibodies are positive but usually in specialized laboratories . PCR study can prove diagnosis . Usually diagnosis are made in clinical background and response to empirical treatment .

## Management

Rickettsia has good response to tetracycline antibiotic 500 mg ,6hourly per day or doxycyclin 200 mg |day or chlorumphenicol 500 mg ,6 hourly for 7 days . Has good response rate low relapse rate , in epidemic typhus and scrub typhus doxycyclin capsule 200 mg | day for 3 days is effective treatment . In resistant cases like R. tustugamushi Rifampicin is effective treatment , good nursing of patients , blood transfusion of anemia and treatment of bleeding ,sedation for delirium and treatment any concomitant infection like enteric fever or pneumonia .

## Prevention

Education people about disease and route of transmission , and if possible eradication of vector of transmission like ticks ,fleas ,rodents and lice .

## Q- Fever

It is caused by *Coxiella burnetii* bacteria which is similar to *rickettsia* structure ,it is also intracellular bacteria .It reservoir the cattle , sheep and goats . Infection to human occur from these animal to human by aerosol droplets .

Incubation period : 3-4 weeks .

clinical features : The patient develop fever ,headache ,chills then symptoms according to organ affected like pneumonia ,hepatitis or endocarditis symptoms.

Investigation : Culture of microorganism ,serology raise in titer of IgM or fourfold rise in titer of IgG .

Management : It is sensitive to doxycycline and Rifampicin drugs .