Leptospira

Classification

Phenotypic classification-

Species-2 species

- a)L.interrogans-pathogenic causes weils disease or leptospirosis
- b)L.biflexa-saprophyte

Serovars and serogroups-Antigenically complex and on basis of agglutination further classified-

L.Interrogans comprises of 25 serogroups further consists of 250 serovars

All serogroups and serovars are morphologically identical,produce similar clinical picture but differ in geographical distribution and severity of infection

L.Biflexa has 65 serovars arranged in 38 serogroups

Genotypic classification-

On the basis of DNA hybridization leptospira classified into 17 genomic species

Leptospira interrogans-

They have size of 6-12 micron m in length and 0.1 micron m in width which allows them to pass through filters allowed to sterilize culture medium Tightly regularly coiled with hooked ends

- Single endoflagellum
- Not stained by ordinary stains and not observed under light microscope
- Dark ground microsopy, phase contrast microscopy , immunoflourescence, silver impregnation method

Epidemiology-

Zoonotic

No human to human transmission

Indirect contact with water, moist soil and wet surfaces contaminated with animal urine or by direct contact with products of parturition , placenta of infected animals

Source-rats ,dogs,cattle ,pigs etc

Risk factors-

- Lower socioeconomic status
- Urban and rural slums
- Rainfall and floods
- Rice field farmers occupational exposure
- 3Rs rice field ,rainfall,rodents
- Global but common in india, brazil and thailand
- Tamilnadu, kerala and andaman nicobar

Pathogenesis 1)Septicemic phase 2)Immune phase Clinical manifestations-Incubation period 5-14 days 1)Mild anicteric febrile illness 2)Weils disease-hepatorenal haemorrhagic syndrome

Lab diagnosis-

- Specimens-csf,blood(10 days) and urine (10-30 days of infection)
- Microscopy-less sensitive and requires expertise serum proteins and fibrin may resemble leptospires
- Isolation-obligate aerobe ,fastidious and culture fluid to be examined 1,3 and 5th day followed by weekly intervals upto 6 weeks

Culture media-EMJH most commonly used

- Leptospires produces dense ring of organisms just underneath surface of medium called dingers ring
- Korthofs and fletchers media can be used
- Adv-confirms diagnosis and maintainance of stock culture
- Disadv-false positive,false negative,time cosuming

Animal inoculation-

Serology-IgM ab appear one week of infection peaks 3 to 4th week and undetectable within 6 months

IgG ab persists for years

Genus specific tests-donot detect infecting serovar

Macroscopic slide agglutination test

Microcapsule agglutination test(MCAT) LAT ELISA Lepto dipstick assay for IgM ICT

Serovar specific test-Microscopic agglutination test(MAT) gold standard

Cross agglutination and absorption test(CAAT) for detcting relatedness between strains

Molecular methods-PCR,RFLP

Treatment-Doxycycline and pencillin for severe cases

- Prevention-No vaccine available
- Control measures-

Rodent control,health education,avoid swimming in contaminated waters,proper waste disposal Chemoprophylaxis with doxycycline for military training