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Popular Article

Leptospirosis: A Zoonotic Disease Hidden in Wet Environment

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INTRODUCTION:

Leptospirosis is a bacterial infection of zoonotic importance as it can spread from animals to humans. It is one of the major causes of abortion in cattle. People get infected through direct contact with urine of infected animal or with soil or mainly water contaminated with urine. It is majorly seen in India due to alkaline pH of soil.

SYNONYMS:

Rice field workers disease, Weil's disease, Stuttgart's disease, cane cutter's disease, canicola disease (dogs), swamp fever, haemorrhagic jaundice, Infectious jaundice.

Leptospira species:

1. The pathogenic species *L. interrogans*
2. Free-living non-pathogenic strains *L.biflexa* and
3. Intermediate

The most common serovars of *L. interrogans* are *L. interrogans* serovar Pomona, *L.interrogans* serovar Hardojobovis, *L.interrogans* serovar Icterohaemorrhagiae *L.interrogans* serovar Canicola, *L.interrogans* serovar Grippotyphosa, *L.interrogans* serovar Bratislava.

TRANSMISSION:

Transmission in animals:

1. Natural reservoirs – Rodents, wild, domestic animals.
2. Contamination of pastures, pens, drinking the water contaminated with urine of infected animals.

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3. Infected male animals transmit the infection to female animals through semen, aborted foetuses, uterine discharges.
4. Dogs get the infection by contact with the soil, water contaminated with infected animal urine or consuming waste products from animals

Transmission from animals to human:

People get infection by contact with fresh water, damp soil, vegetation contaminated by urine of infected animals and through water related activities such as swimming, which are important risk factors.

DISEASE CONDITION OF LEPTOSPIROSIS IN VARIOUS ANIMALS:

IN CATTLE:

- Abortion (last trimester) and neonatal mortality
- Mastitis (flabby bag syndrome in Buffalo)
- Haemoglobinuria, jaundice and fever in calves
- Death rate high in calves.

IN PIGS:

- Subclinical with leptospiruria
- Fever & non-suppurative mastitis
- Infertility, abortion and still birth
- Haemoglobinuria, jaundice and fever.

IN HORSE:

- Recurrent iridocyclitis/periodic opthalmia / moon blindness
- Abortion.

IN DOGS:

- Subclinical with leptospiruria
- Acute haemorrhagic type characterized with fever, vomiting, prostration and death
- Less acute icterus type
- Uremic type
- Leucocytosis and azotemia

IN HUMANS:

- Leptospiraemic phase – 4-7 days – Dissemination of Leptospires in blood, cerebrospinal fluid and most tissues, clinically characterized by extensive vasculitis.

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- Leptospiruric phase – Leptospires disappear from blood and CSF – lodges in kidney, aqueous humour, appears intermittently in urine
- Anicteric leptospirosis -Seen in 90 % of cases
- Septic phase (3-7 days)

Onset with high fever and chills, myopathy, commonly involving calf muscle, lumbosacral region and abdominal muscles. Head ache associated with retrobulbar pain, severe head ache, usually untolerable, mostly in the frontal region, renal involvement usually asymptomatic, pulmonary involvement (cough), abdominal pain, nausea, vomiting, diarrhoea and conjunctival suffusion

- Immune phase (0-30 days)

Aseptic meningitis, conjunctival haemorrhages, rashes, cough, blood-stained sputum, Pulmonary infiltrates, acalculous cholecystitis (common in children)

Icteric leptospirosis or Weil's disease (5-10 percent of cases)

a. Septic phase (3-7 days) – Symptoms similar to anicteric form
b. Immune phase (7-30 days)-Jaundice hepatic encephalopathy – clinical signs of jaundice with nervous signs, renal Failure (oliguria or anuria), epistaxis, petechiae, rashes, gastrointestinal and pulmonary Haemorrhage, myocarditis and pulmonary involvement, hepatomegaly, uveitis – Common,transmission vertically from mother to offspring. Elevated liver enzymes, decreased renal Output, anuria, odema of dependant parts and face and dyspnoea.

DIAGNOSIS:

Samples of choice – Whole blood, CSF, serum

1. Dark field microscopy (DFM) – blood or CSF – fresh sample within 4-6 hours of collection. One disadvantage is that sample must contain 10^4-10^5 organism per ml.
2. Microscopic Agglutination Test (MAT) is the gold standard test, for diagnosis of leptospirosis using serum sample
3. In case of tissue sample-Silver impregnation staining technique or Fontana Staining can be done.
4. Tissue culture by using EMJH or Stuarts's medium or Fletcher's medium

TREATMENT:

Based on clinical signs and diagnostic tests – usually the treatment is started

In Humans

- Penicillin – 15-20 Lakhs IU – IV every six hourly for seven days, Children – 2 lakhs IU

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- Doxycycline – 100 mg twice daily for seven days for adult hours. Children –Amoxicillin – 30-50 mg once in 6 hours interval for seven days.
- Supportive therapy based on clinical signs.

In Dogs

- Amoxicillin – 12.5 mg/kg twice daily to combat leptospiraemia
- Doxycycline – 10 mg/kg once daily (or) 5 mg/kg twice daily to combat leptospiruria
- Supportive therapy based on clinical signs.

PREVENTION AND CONTROL:

- Control of rodents, drinking safe wholesome water and eating of safe food
- Proper disposal of animal wastes
- Vaccination of pet animals with serovars predominant in that area – Vaccines containing serovars L. canicola, L. pomana, L. icterohaemorrhagiae and L. Grippotyphosa are available in the market. Usually, Leptospira vaccine for pets is an inactivated vaccine available as combined vaccine with canine distemper virus, infectious hepatitis virus, parainfluenza virus and parvo virus.
- Wearing personal protective equipments (gloves, goggles, gum boots) while swimming, and other water related activities, walking in contaminated water etc.
- Leptospirosis occur as an outbreak during disasters like flood, heavy rainfall. During that proper care should be taken to avoid infection with Leptospires.
- Prophylactic administration of Doxycycline – 200 mg per week (humans).

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