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Popular Article

## Leptospirosis

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**Synonyms:** Weils disease, rice field fever, canicola fever.

This is a disease of dogs and large domesticated animals caused by several species of *Leptospira*, it is a zoonotic disease.

**Incidence:** It is seen in cattle, pig, sheep, dog and man. The rat is a reservoir of the organism from dogs and man may be infected. The condition caused by *L. icterohemorrhagiae* in man is known as weils disease.

**Route of infection:** Ingestion of infected materials Pasteur in urine, through coitus -semen of infected bull may contain the organism transmitted by Artificial insemination, through abrasions of skin or Conjunctiva nasal mucosa, in man - swimming of infected water.

### Leptospirosis in large animals:

Mortality -low

Morbidity-high

Economic loss among cattle mainly due to abortions.

**Cattle:** *L.icterohemorrhagiae*, *L.pomona*, *L.canicola*, *L.grippotyphosa*.

**Pigs:** *L.pomona*, *L.canicola*, *L.icterohemorrhagiae*.

**Sheep:** *L.pomona*.

**Goat:** *L.grippotyphosa*.

**Horses:** *L.pomona*, *L.canicola*, *L.icterohemorrhagiae*, *L.grippotyphosa*.

These organisms cannot be differentiated or identified by morphological examination; only serological test is useful.



\*Then spirochactes can be seen by dark field examination of fluid media.

In sections there are stained black by sliver stain of levaditi and warthin-starry

### **Pathogenesis**

The entry of organisms invades the blood stream and multiply, it producing septicemia. During this period temperature raises, this phase last for several days, if the animal does not die during septicemic phase, the organisms settle down in the liver, kidney and pregnant uterus. An acute form is common in calves, piglets and lambs. The sheep, goat the organisms may localize in the nervous tissue producing encephalitis. During the acute phase jaundice is seen in all animals due to intravascular haemolysis and hepatic necrosis, anemia, icterus and haemoglobinuria are noticed. Leptospira found in urine. Albuminuria is present due to interstitial nephritis -focal or diffuse. Uremia may supervene and death occurs.

### **Symptoms:**

Cattle: Incubation period – 2 to 10 days

Mortality: 5%

Morbidity: 100%

**Acute form:** septicemia, increased temperature, anorexia, petechiae on the visible mucous membranes, haemoglobinuria, jaundice and anemia, tachycardia, dyspnea.

**Lactating animals:** milk curdles, abortions.

**Death:** 2 to 7 days.

Subacute form: similar to acute form. mild icterus, fever, haemoglobinuria, abortions.

**Chronic form:** No clinical symptoms, abortions occur, chronic form detected only by serological tests. They void the organisms in urine for 2 months after recovery.

### **Lesions:**

**Acute form:** *L. pomona* produces a haemolysin and causes icterus and severe anemia. Hypoplasia of the bone marrow, petechiae observed on the serous membranes.

**Liver:** Macroscopically - Haemorrhages near central vein

**Microscopically:** Centrilobular necrosis, due to hypoxia evident. Liver cells disassociated and separated from the sinusoidal Epi due to accumulation of edema fluid. Kupffer cells- hyperplastic contain hemosiderin crystals. lymphocytic infiltration in portal tracts.

Organisms are intracellularly.

**Kidney:** Macroscopic lesions: Swollen and red.



**Microscopic lesions:** Tubular epithelium shows degenerative changes from hydropic degeneration to necrosis, necrosed epithelium become desquamated from granular, cellular, hyaline casts, haemoglobin bile pigment in the lumen, interstitial tissue edematous, organisms are present in epithelial cells or lumen of tubules.

Spleen: Hemosiderosis, acute hemorrhagic meningitis.

**Sub-acute form:** Kidney: Organisms are present in tubules, excretion in urine.

Interstitial nephritis. Placenta show lesions – placentitis, abortions.

**Sheep :** per acute, jaundice. Abortion in acute form.

**Goats** - abortions, icterus.

**Pigs :** L.Pomora causes abortions. Interstitial nephritis.

**Horses:** L.Pomora – periodic ophthalmia, conjunctivitis, keratitis, photophobia , iridocyclitis.

**Dog:** *L.canicola*

Symptoms - Jaundice

**Peracute:** epistaxis ,fever, hematemesis, melena.

Acute:fever, anaemia, icterus, diarrhoea, vomition, dehydration, emaciation, increased ESR , foal odour, albuminuria.

Subacute: uremia

**Lesions:**

**Macroscopic :** No lesions

**Microscopic:** Hepatic cells are shrunken, rounded.Nuclei- pyknotic, hypercheomatic.

Intestinal mucosa- congestion, haemorrhages.

Purulent necrotic laryngitis – Pathognomonic lesion of canine leptospirosis.

Canicola cause nervous symptoms associated hyperemia and petechiae of brain and spinal cord,

Purulent lymphocytic meningo-encephalitis.

**Diagnosis :** based on symptoms – Icterus, anaemia , haemoglobinuria ,abortions.

Demonstration of organisms in sections by levaditi's stain.

Microscopic agglutination test, agglutination lysis test, inoculation of guinea pigs intraperitoneal of blood , milk or urine . Dark field examination of urine.

**Differential Diagnosis:** Babesiosis, anaphasmosis, Brucellosis, post parturient haemoglobiurea.

**Pigs:** Brucellosis.

**Sheep:** Chronic copper poisoning, anaplasma.

**Dog:** Black tongue, infectious viral hepatitis.

