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VIBRIOSIS OF FISH

Red pest of eel, Red sore disease, Pike pest, Red boil, Salt water furunculosis

Definition

"Acute, sub-acute, and chronic bacterial disease of marine, brackish and freshwater fishes characterized by septicemia, erythema and hemorrhages on the skin with high morbidities as well as high mortalities".

Etiology

Vibrio* (*Listonella*) *anguillarum, and ***Vibrio ordalii*** are the most ***Vibrio*** species incriminated in fish vibriosis. They are, Gram negative straight or curved rods, motile by polar (axial) flagellum, non-spore forming, non acid fast, non capsulated and doesn't produce pigment. The organisms facultative anaerobic ferment glucose with production of acid only.

There are 3 serotypes, which are responsible for the disease outbreaks.

Susceptibility

About 48 fish species are susceptible to be infected with ***V. anguillarum*** or ***V. ordalii*** most of them are marine and estuarine ones (salmonids, sole, cod, mullet, herring, flounder and turbot). Also freshwater fishes (eels, tilapia,carp,trout, barbes) are susceptible to vibriosis.

Predisposing causes (stressors)

- Overcrowding.
- Low dissolved oxygen.
- Presence of large amount of organic matter.
- Nutritional deficiencies.
- Injuries of the skin or gill either by trauma or ectoparasites.
- Temperature variation between seasons (eg. summer &

spring).

- Rough handling especially during transportation.

Mode of infection

Mainly through ingestion and injuries of skin and/or gills.
Feeding on infected fish offal's.

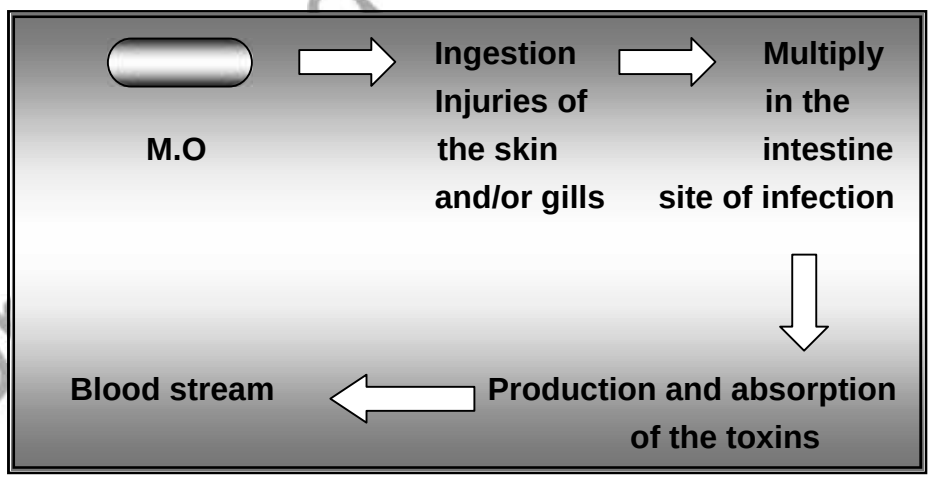
transmission

The transmission or the spread of the disease is usually horizontal (from infected material to the fish).

Source of infection

- Shaded microorganisms from infected aquatic animals, infected dead carcasses as well as polluted water with the microorganism act as the source of infection.
- Carriers specially herring fish.
- Polluted eggs in hatcheries and the water itself contain the organism as a commansales consider as a source of infection.

Pathogenesis



Disease signs

Peracute or Acute:

- Onset of rapid fatal septicemia associated with mortality rate of 90-100%. The dying fish are easily to be handled and crowed at the water surface.

Subacute:

- Erythema at the base of fins, mouth, groves under the lower jaw and around the anal opening.
- Boil like lesion under the skin and in the muscle, which may breakout to the exterior leaving opened sores that oozed blood-tinged exudates.

Atlantic salmon, *Salmo salar,* with vibriosis. Erythema around anus.

Goldfish, *Carassius auratus,* with vibriosis. Boil like lesion under the skin.

Rainbow trout, *Oncorhynchus mykiss,* with vibriosis. Opened hemorrhagic sore on the peduncle region.

Photo courtesy TFH Publications

Chronic or ulcerative:

- Deep glaucomatous muscle lesion on various parts of the body.
- Eye lesions including corneal edema, exophthalmia and ulceration.

Postmortem (P.M.) Findings

- Cut surface of the muscle revile presence of petechial hemorrhages and large boil-like lesions.
- Petechial hemorrhages in the peritoneum and visceral organs.
- Splenomagally and enteric hyperanemia.
- Kidney and liver become friable and soft.

Microscopic Pathology

- Congestion, dilated blood vessels and edema together with hyper-anemia of the hypodermis as well as epidermis.

- Zenker's necrosis in the center of the dermis and hypodermal layers.
- Focal coagulative and lquifactive necrosis of the liver, kidney's cells.
- Deposition of hemosidrine in the melano-macrophage centers of the spleen and hematopiotic tissues of the kidneys.

Diagnosis

I. Case history revealed that:

- Cessation of feeding or the fish refuse the food.
- Sluggish swimming and the fish swimming just below the water surface.
- Presence of mortalities.

II. The disease signs

III. The P. M. findings.

IV. Laboratory diagnosis:

- Samples: kidney, liver, spleen, blood, muscles especially the deep layer of the muscles.
- Squash smear from the organs stained with Gram.
- Isolation and identification:

  Vibrios could be isolated and grow well on ordinary medium supplemented with 1.5-3.5% NaCl, Nutrient agar (NA), typto-soy agar (TSA), MacConkey agar and Brain heart agar (BHA) at 18-20 ºC giving white to pinkish round small colonies.

  On Rimler-Shotts (R-S) medium it can grow only as small white round colonies if the vibriostatic agent (0/129 and/or novobiocin) isn't included.

  Identification through using biochemical tests, API kits, gel-diffusion test, FAT, ELISA, and PCR (polymerase chain reaction).

- Histopathological findings (as mentioned above).

Therapy & Control

Chemotherapy

- In early stages of infection antiseptic bathes are recommended.
- Oxytetracycline 55mg/Kg fish in the food for 10 days.
- Sulfamerazine 264mg/Kg fish in the food for 3 days followed by 154mg/Kg fish for additional 11 days.
- Sulfaguanidine + sulamerazine combination (1 : 2) 130mg/kg fish for 3days followed by 90mg/Kg fish for 11days
- Nitrofurzone 56mg/kg fish for 10 days.
- Oxolinic acid 10~30mg/Kg fish for 10 day.

Control

Good hygiene and removal of all stressors is the proper way for disease control this can be achieved through:

- Avoid overcrowding.
- Proper disposal of dead and dying fishes either by burning or burying.
- Control of aquatic animals such as reptiles and amphibians.
- Destruction of the carriers and disinfectant of the eggs.
- Proper disposal of infected fish if in small number.
- Proper drainage, drying, and disinfectant of the pond (quick lime 4 tone/acre.
- Vaccination using oral bacterine, hyperosmotic infiltration poly-vaccine.