

Infectious Keratoconjunctivitis (Pinkeye, Infectious ophthalmia)

Infectious keratoconjunctivitis of cattle, sheep, and goats is characterized by blepharospasm, conjunctivitis, lacrimation, and varying degrees of corneal opacity and ulceration.



Infectious bovine keratoconjunctivitis (IBK) is the most common ocular disease of cattle and is seen worldwide.

- ❖ Although the mortality is low, there is a high morbidity and important economic loss in terms of significant reduction in production.

Etiology:

The gram-negative coccobacillus *Moraxella bovis* is the only organism demonstrated to cause IBK in cattle. Seven different serogroups of *M. bovis* are currently recognized.

In sheep and goats, naturally occurring conjunctivitis or keratoconjunctivitis can be associated with *Chlamydia pecorum*, *Mycoplasma* spp (notably *M conjunctivae*), *Moraxella ovis*, *Colesiota conjunctivae*, *Listeria monocytogenes*, *Acholeplasma oculi*, and *Thelazia* spp.

Risk Factors: Include one or more of the following:

1. Plant awns
2. Face flies
3. Ultraviolet radiation from bright sunlight
4. Dry and dusty environmental conditions
5. Shipping stress
6. In cattle, trace mineral deficiencies such as selenium and copper deficiency.
7. Flies can also serve as vectors for *M bovis*.
8. Infection with IBR virus or other microbes may increase the severity of infection with *M. bovis*.

Pathogenesis:

Hemolysin and pili have been proposed as *M. bonis* virulence factors. The latter are surface appendages of the bacterium composed of a repeating polypeptide subunit termed pilin. This unique bacterium is able to disrupt the corneal epithelium and cause infection.

Clinical Findings:

- The disease usually is acute and tends to spread rapidly.
- In all species, young animals are affected most frequently, but animals of any age are susceptible.
- One or both eyes may be affected.
- **The earliest clinical signs** are photophobia, blepharospasm, and epiphora; later, the ocular discharge may become mucopurulent.
- Conjunctivitis, with or without varying degrees of keratitis, is usually present.
- **In sheep and goats;** Concurrent polyarthritis may be present in association with *Chlamydia pecorum* infections.
- Appetite may be depressed because of ocular discomfort or visual disturbance that results in inability to locate food.
- **The usual clinical course** varies from a few days to several weeks.
- Most corneal ulcers in cattle with IBK heal without loss of vision
- Corneal rupture and permanent blindness can occur in the most severe cases.

Lesions:

- In cattle, one or more small ulcers typically develop near the center of the cornea.
- Initially, the cornea around the ulcer is clear, but within a few hours a **haze appears** that subsequently increases in opacity.
- After 48–72 hr in severe cases, the entire cornea may become opaque, blinding the animal in that eye.
- Corneal opacity may result from edema (hazy white to blue), which is a part of the inflammatory process, or leukocyte infiltration (milky white to yellow), which indicates severe infection.
- Continued active ulceration may cause corneal rupture.

Diagnosis:

- In all species, presumptive diagnosis is based on ocular signs and concurrent systemic disease.
- Microbial culture may be beneficial in confirming the causative organisms.
- PCR analysis can be used to detect *Chlamydia* and *Mycoplasma* spp.

Differential Diagnosis:

- It is important to distinguish that the lesions are not due to foreign bodies or parasites.

- In IBR, upper respiratory signs and conjunctivitis predominate, while keratitis accompanied by ulceration is rare.
- In bovine malignant catarrhal fever, respiratory signs are prominent with primary uveitis and associated keratitis.
- *Mycoplasma* spp may cause conjunctivitis of cattle, either alone or in conjunction with *M. bovis*.
- Most other ocular infections of cattle are characterized by conjunctivitis with minimal or no keratitis.

Treatment:

1. One common treatment is sub-conjunctival injection with **penicillin** or a combination of **oxytetracycline and dexamethasone**.
2. Long-acting oxytetracycline (two injections of 20 mg/kg, IM, at a 48- to 72-hr interval) and tulathromycin (2.5 mg/kg, SC, given once) are effective..
3. Other effective antibiotics include ceftiofur crystalline free acid (6.6 mg/kg, SC, at the base of the ear) and florfenicol (20 mg/kg, IM, two doses at a 2-day interval).
4. Topical ophthalmic therapy include gentamicin and a combination oxytetracycline/polymyxin B ointment.

Supportive treatment:

1. housing the animal in a **dark** stall, away from light, **dust**, and other irritants, and **covering the eye with patch**, both to protect the eye itself in addition to preventing the further spread of the bacteria by **flies**
2. For **severe cases**, particularly those involving **ulceration** of the cornea, a **surgical** manipulation of the third eyelid may be completed to cover the defect in the cornea and stimulate healing.
3. Systemic **NSAIDs** such as **Flunixin Meglumine** (Banamine) or corticosteroids such as **Dexamethasone** may be given to provide pain relief and reduce inflammation.
4. A topical application of **1% atropine** ophthalmic ointment may be used to decrease the painful spasms of the pupil.

Prevention and Control:

- ✓ Good management practices are of paramount importance to reduce or prevent spread of infection in cattle, sheep, and goats.
- ✓ Separation of infected animals is beneficial when possible.
- ✓ Gloves and protective clothing should be worn and then disinfected between animals when affected individuals are being handled.
- ✓ *M bovis* bacterins are available and can be administered before the beginning of fly season.