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## Stage I: Infectious bovine keratoconjunctivitis in a crossbred jersey cow and its clinical management: A case report

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### Abstract

The present study describe the stage I infectious bovine keratoconjunctivitis in a 4 year old female jersey cross breed dairy cattle weighing 300 kg was managed semi-intensively. A clinical examination on eye reveals that excessive tearing of eye and increased sensitivity to light which progresses to a small ulcer in the centre of the cornea which appears as a small white spot. The crossbreed jersey cow was administered with oxytetracycline LA (10mg/kg bodyweight) once in 3 days on alternate basis for 2 weeks. Ciprofloxacin (Ciplox) eye drops @ 10 drops thrice a day at regular basis for 3 weeks, subconjunctival prednisolone 0.3ml on alternative day and vitamin AD3E injection was given 10 ml intramuscularly and following this treatment the eye lesion was gradually subsided.

**Keywords:** stage I infectious bovine keratoconjunctivitis, corneal ulcer, dairy cattle

### Introduction

Infectious bovine keratoconjunctivitis (IBK) also known as pinkeye or New Forest eye or blight, is an eye infection of cattle caused by *Moraxella bovis*. It is a Gram-negative,  $\beta$ -haemolytic, aerobic, rod-shaped bacterium and it is spread by direct contact or by flies serving as vectors. It is the most common ocular disease of cattle (mostly beef). Infectious bovine keratoconjunctivitis is similar to human pink eye and causes severe infection of the conjunctiva, edema, corneal opacity, and ulceration. This disease is highly contagious and occurs worldwide. Younger animals are more susceptible, but recovery with minimal damage is usual, if they are treated early. Infectious bovine keratoconjunctivitis (IBK) is one of the most common diseases of cattle mostly caused by gram negative bacterium known as *Moraxella bovis* (Barner *et al.*, 1952) <sup>[2]</sup> and occasionally by *Morexella boviculi* (Angelos *et al.*, 2007) <sup>[1]</sup>.

The disease is highly contagious, it can also cause great economic impact such as reduction in growth rate of growing calves, reduction in milk production of dairy cows and also reduction in the market values of afflicted cows (Frisch, 1975) <sup>[4]</sup>. Pathogenesis of the disease is influenced by many factors, such as season, mechanical irritation (dust, grass, weeds, etc.) host immune response, eye pigmentation, and concurrent presence of pathogenic bacteria, environment, and strain of *M. bovis* (Webber and Selby, 1981) <sup>[9]</sup>; Snowden, *et al.*, 2005) <sup>[7]</sup>. Transmission of *M. bovis* is by direct contact, nasal and ocular discharges, and most commonly by the face fly (Brown and Adkins, 1972) <sup>[3]</sup>. Other factor that may influence the occurrence of Infectious bovine keratoconjunctivitis is breed differences; Hereford, jersey and Holstein Friesian is more susceptible compared to other breed (Frisch, 1975) <sup>[4]</sup>; Webber and Selby, 1981) <sup>[9]</sup>. However, it is not fully known to which extent that the genetic may affect the animal as for example genetic selection and breeding will help decrease the incidence of IBK (Frisch, 1975) <sup>[4]</sup>; Webber and Selby, 1981) <sup>[9]</sup>

### History and clinical signs:

Owner reported that the animal was four year old with the history of excessive tearing of eyes and white spot on the cornea and the daily feed management of cattle were fed with concentrate feed in pellet form (SKM brand) in the morning, evening and were allowed to graze in the afternoon. Milking was done twice a day in the morning and in the evening. Based on the history the clinical examination reveals that

- Anorexia, tearing, overflow of tears onto the face, rapid blinking and squinting shade.
- Physical examination was carried out on the day of presentation and the temperature,

pulse and respiratory rates were within the normal ranges however, there was an epiphora of the affected left eye which had a small white spot on the cornea.

- On close examination of eye revealed that the eye was become cloudy or opaque with central corneal ulceration (a circular pit develops in the center of the eye), swelling and redness of the tissues suggestive of Infectious bovine keratoconjunctivitis.
- Menace reflex and palpebral reflex test were done on the affected eye which results in the loss of menace reflex of the left eye which indicates loss of sight of the left eye however there was still presence of palpebral reflex on both lateral and medial aspect of the eye.

### Discussion

There are many predisposing factors which contributes towards the infection of IBK in cattle such as genetic and age (Webber and Selby, 1981)<sup>[9]</sup>; Ward and Nielson, 1979)<sup>[8]</sup>.

Vitamin A, copper and selenium deficiencies are also another factors contributing to the infection of IBK. Vitamin A deficiency will cause the impairment of the lining of the eye (conjunctiva and sclera) and this will lead to the failure of the conjunctiva and sclera to provide protection against organism or physical agent which may cause damage to the lining of the eye. Furthermore, vitamin A helps in new cell growth, healthy skin, hair, and tissues, and vision in dim light (Snowder *et al.*, 2005)<sup>[7]</sup>.

Concurrent infection with viruses and Infectious bovine rhinotracheitis (IBR) and *Mycoplasma bovoculi* may also cause eye disease. Irritation of the eye is a major predisposing factor to pinkeye. Sunlight, dust, pollen, weed and grass seeds or awns are major eye irritants. Irritation causes primarily inflammation that allows the *M. bovis* organism to invade the tissues and multiply. Sun light allow irritation of the corneal epithelium resulting in an entry point for pathogens in to the eye. Clinical lesions of IBK can be categorized into four stages according to their severity.

Stage I is indicated when there is an excessive tearing and increased sensitivity to light which progresses to a small ulcer in the centre of the cornea which appears as a small white

spot.

Stage II is indicated when the ulcer spreads across the cornea with the cornea becoming increasingly cloudy (increased opacity). Blood vessels from the outside portion of the cornea begin to grow across the cornea to help enhance healing.

Stage III is indicated when the ulcer has covered almost the entire cornea and inflammation continues to spread into the inner parts of the eye. The inside of the eye is filled with fibrin, which is a pus-like substance that gives the eye a yellow appearance.

Stage IV becomes obvious when the ulcer extends completely through the cornea, and the iris may protrude through the ulcer. The iris will become stuck in the cornea even after healing process has occurred.

### Treatment:

Animal was given Oxytetracycline (LA) injection at the dose rate of 20 mg/kg b.wt, intramuscularly and topical eye ointment of ciprofloxacin 10 drops thrice a day for 3 weeks it contains an antibiotic which helps in reducing the irritation of the eye and inhibits the progression of ulcer. Oxytetracycline was chosen as the antibiotic of choice for the treatment as it is a broad-spectrum bacteriostatic antibiotic effective against mycoplasma, chlamydia or rickettsial organisms (Roeder *et al.*, 2005)<sup>[6]</sup>; McConnel *et al.*, 2007)<sup>[5]</sup>. Subconjunctival administration of corticosteroids prednisolone 0.3ml alternative day and vitamin AD3E injection was given 10 ml intramuscularly and addition of vitamin and mineral supplement (Agrimin forte) 100g per day in concentrate feed is advised to feed an affected animal twice a day. Following these treatment affected animal shows good response and healing process.

### Control and prevention

- Addition of vitamin A in feed,
- Fly control,
- Vaccination,
- Farm management



Before treatment (0<sup>th</sup> day)

After treatment (3<sup>rd</sup> day)

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