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Case Report

Clinical management of stage I pinkeye with concurrent pneumonic pasteurellosis in a goat: A case report

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ABSTRACT

Objective: This clinical case reports the occurrence of stage I pinkeye with concurrent pneumonic pasteurellosis in a goat.
Materials and methods: A 2-year-old Jamnapari goat weighing 25 Kg was presented to the Universiti Veterinary Hospital, Universiti Putra Malaysia with primary complain of eye problem and inappetence.
Results: Upon clinical examination, the most prominent abnormality observed was corneal opacity of the right eye with presence of ulceration on the corneal surface and chemosis of the right conjunctiva with excessive lacrimation. On auscultation, there was the presence of crackle lung sounds with bilateral mucopurulent nasal discharges. Samples from the ocular swab yielded a positive growth for *Mycoplasma spp.*, while the nasal swab yielded a positive growth for *Mannheimia haemolytica*. The goat was diagnosed with stage I pinkeye with concurrent pneumonic pasteurellosis infection. Treatment was instituted with 400 mL of 0.9% NaCl administered intravenously once for rehydration. Flunixin meglumine 2.2 mg/kg bwt was given intramuscularly twice daily for three days as anti-inflammatory and analgesic. Oxytetracycline 20 mg/kg bwt was injected once intramuscularly as long acting broad spectrum antibiotic for treatment of pinkeye and pasteurellosis infections. Furthermore, terramycin eye ointment containing oxytetracycline HCl was also administered intraocularly twice daily for seven days as treatment for the *Mycoplasma spp.*
Conclusion: The prognosis for this case was good as the goat were treated promptly and effectively.

KEYWORDS

Goat; Stage I pinkeye; Pneumonic pasteurellosis; Clinical management

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INTRODUCTION

Inflammation of the cornea and the conjunctiva are the two main characteristic of infectious keratoconjunctivitis also commonly known as pinkeye in sheep and goats (Whittier et al., 2009). Infected animals will usually exhibit conjunctivitis, lacrimation, blepharospasm and different stages of corneal opacity and ulceration (Abdullah et al., 2014). In goats, mycoplasmal infections are the main aetiological agent causing pinkeye. Stresses such as dusty environmental conditions, transportation stress, bright sunlight and irritants are few predisposing factors for the disease. Besides, flies were found to serve as vectors for M*ycoplasma* spp (Abdullah et al., 2015; Fernandez-Aguilar et al., 2017). Presumptive diagnosis of pinkeye is usually sufficient based on ocular sign and systemic infection. However, microbial culture, cytologic evaluation and PCR could be done to confirm the disease (Kahn and Line, 2005). Bacterial culture and susceptibility testing is advised before any treatment is carried out because antibiotic susceptibility may vary depending on different geographical regions. Nonetheless, oxytetracycline is generally considered the drug of choice for systemic therapy because it is concentrated in the corneal tissue. On the other hand, concurrent infection of pneumonic pasteurellosis is also common in goats after shipping stress (Marru et al., 2013). *Mannhaemia haemolytica* and *Pasteurella multocida* are common commensal organisms of the upper respiratory tract of goats (Abdullah et al., 2014). Shipping stress causes immunosupression in animals, which allows for multiplication of invading bacteria, bacterial adhesion and colonization, and disease pathogenesis (Zamri-Saad et al., 1994). This clinical case reports the management of stage I pinkeye with concurrent pneumonic pasteurellosis in a goat, where prompt diagnosis and treatments were able to resolve the case successfully.

MATERIALS AND METHODS

History: A 2-year-old Jamnapari goat weighing 25 Kg (BCS1.5/5) was presented to the Universiti Veterinary Hospital, Universiti Putra Malaysia with primary complains of eye problem and inappetence. The goat was managed intensively where the deworming status was up-to-date. The goat was brought into the farm two weeks ago together with 21 other goats.

Clinical Examination: Clinical examination findings revealed that the goat was dull, depressed and recumbent (**Figure 1A**). The mucous membrane was pale with a capillary refill time of more than 2 Sec, indicating dehydration. The goat was pyrexic (40°C). The most prominent abnormality observed was corneal opacity of the right eye with presence of ulceration on the corneal surface (**Figure 1B**) and chemosis of the right conjunctiva with excessive lacrimation (**Figure 1C**). On auscultation, crackle lung sounds were present, while bilateral mucopurulent nasal discharges were also seen (**Figure 1D**). The differential diagnoses at this point of time were pinkeye, pasteurellosis and malnutrition.

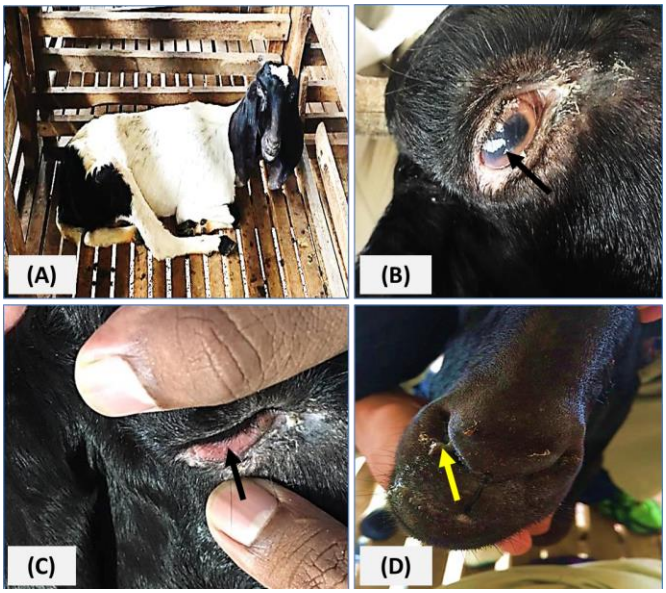

Figure 1. Clinical examination of eyes. **(A)** Dull, depressed and recumbent goat with BCS of 1.5/5, **(B)** Opacity of the right cornea with presence of ulceration, **(C)** Chemosis of the right conjunctiva with excessive lacrimation, **(D)** Bilateral mucopurulent nasal discharge.

RESULTS

Diagnosis Work-Ups: Ocular and nasal swabs were collected for bacterial isolation and identification. The results showed positive growths for *Mycoplasma* spp and *Mannheimia haemolytica*, respectively. Based on the bacterial culture, the goat was diagnosed with stage I pinkeye with concurrent pneumonic pasteurellosis infection.

Treatment: Affected goat was treated promptly and effectively according to welfare guidelines. The therapeutic plan for this case was to rehydrate the goat and also institute treatment for pinkeye and pasteurellosis. 400 mL of 0.9% NaCl was administered intravenously once for rehydration. Flunixin meglumine (dosed at 2.2 mg/kg bwt) was given intramuscularly twice daily for three days as anti-inflammatory and analgesic. Oxytetracycline (dosed at 20 mg/kg bwt) was injected once intramuscularly as long acting broad spectrum antibiotic for treatment of pinkeye and pasteurellosis infection. Furthermore, Terramycin eye ointment containing oxytetracycline HCl was also administered intraocularly twice daily for seven days as treatment for the Mycoplasma infection.

Prognosis: The prognosis for this case was good because the goat was treated promptly and effectively. Follow up showed that the goat responded well to the medications after one week post treatment as the corneal opacity of the right eye (**Figure 2A**) and bilateral mucopurulent nasal discharge (**Figure 2B**) had both resolved.

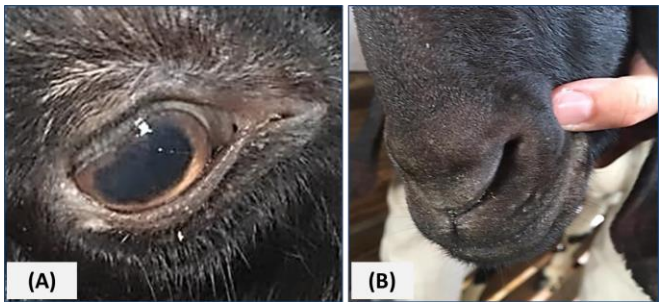

Figure 2. Improvement of eye condition. **(A)** Resolved corneal opacity of the right eye with no evidence of chemosis and conjunctivitis, **(B)** Resolved bilateral mucopurulent nasal discharge.

DISCUSSION

Conjunctivitis, lacrimation, blepharospasm and different stages of corneal opacity and ulceration are few clinical manifestations of pinkeye (Abdullah et al., 2014). As the disease progresses without treatment, ocular discomfort and visual disturbance may lead to inappetance or inability to locate food. These will then consequently affect the body condition score (BCS) resulting in emaciation as was observed in the present case. There are four stages of pinkeye diseases in ruminants (Whittier et al., 2009). Stage I exhibits excessive tearing and increased sensitivity to light which progresses to a small ulcer in the centre of the cornea, these were all observed in this case. Stage II occurs when the ulcer spreads across the cornea resulting in increased opacity of the cornea. The disease will progress to stage III as the ulcer covers almost the entire cornea and inflammation continues to spread into the inner parts of the eye. The ulcer will then extend completely through the cornea and the iris may protrude through the ulcer at stage IV if the disease is left untreated. In the present case, treatment was administered promptly at the first stage and the disease was resolved thereby preventing the development of temporary or permanent blindness (Abdullah et al., 2014).

Pasteurellosis or shipping fever is the most common problem faced by small ruminant holders in Malaysia (Chung et al., 2015). Environmental stress, poor nutrition, poor husbandry and mainly transportation stress causes immunosupression that contribute to the development of pasteurellosis in sheep and goats leading to huge economic losses (Jesse et al., 2014). Similarly, environment and shipping stress also contribute to the development of pinkeye disease (Kahn and Line, 2005). As a result, concurrent infection of pinkeye and pasteurellosis were observed in this case as the infected goat was transported into the farm two weeks prior to presentation. Nevertheless, flies or dusty environment may also serve as risk factors for pinkeye disease (Abdullah et al., 2015).

The catastrophic effect of these two diseases can be reduced significantly with proper control and prevention (Njaa and Wilcock, 2013). Good farm management and proper herd health are the keys to reduce and prevent the spread of pinkeye and pasteurellosis in sheep and goats. Quarantine of new or infected animals is beneficial if possible because some of these animals may be asymptomatic carriers (Kahn and Line, 2005). Administration of tetracycline is recommended for systemic therapy of both pinkeye and pasteurellosis in goats (Kaoud et al., 2010). Tetracycline is the most susceptible antibiotic against *Mannheima haemolytica* based on antimicrobial susceptibility tests (Shiferaw et al., 2006). Besides, the use of systemic oxytetracycline is also effective against pinkeye disease because it is concentrated in the corneal tissue, thus preventing further spread of the infection. Parenteral Oxytetracycline administration was beneficial in treating both pink eye and pasteurellosis in this case. In addition to treatment, vaccination is also important in the control of pinkeye and pasteurellosis, however, this is not widely practiced in Malaysia. This may be due to the unavailability or the unpopularity of the usage of vaccine in the small ruminant industries (Zamri-Saad et al., 1994).

CONCLUSION

Administration of parenteral Oxytetracycline and intraocular Terramycin treatments were able to cure pinkeye and pasteurellosis in this case. The success of the treatment is attributed to the early presentation of the case by the farmer (Stage I). Bacterial isolation and identification was paramount in identifying the causative pathogens hence the treatment success recorded.

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CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

AUTHORS' CONTRIBUTION

All authors contributed equally.

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