Overview

Conjunctivitis is inflammation of the conjunctiva or mucous membrane, which covers the posterior aspects of the eyelids and nictitating membrane (palpebral conjunctiva), and the superficial surface of the sclera (bulbar conjunctiva). It is a nonspecific finding of ophthalmic and often systemic diseases, as the eye has limited ways to react to injury (Brooks 2005, 2008; Brooks and Matthews 2007; Plummer 2008). Infectious and noninfectious diseases of the eyelids, cornea, sclera, anterior uvea, nasolacrimal system and orbit commonly result in conjunctivitis in the horse.

Causes

Conjunctivitis is often associated with ulcerative keratitis (Fig 1), corneal stromal abscesses (Fig 2), equine recurrent uveitis (Fig 3) and obstructed nasolacrimal ducts in horses (Brooks 2005, 2008; Gilger 2005; Brooks and Matthews 2007; Plummer 2008). Conjunctivitis in the horse may be secondary to trauma to the globe, conjunctival foreign bodies and debris, and allergic reactions to dust, hay, sand, dirt, ammonia, pollen, ash and environmental irritants. Equine neonates may develop conjunctivitis from placentitis (Fig 4), septicaemia, subconjunctival or episcleral haemorrhages secondary to birth trauma, and pneumonia. Conjunctivitis caused by environmental irritants is common among neonates with recumbent foals being especially at risk (Brooks 2005, 2008; Gilger 2005; Brooks and Matthews 2007; Plummer 2008). Infectious causes of equine conjunctivitis include the parasites Habronema megastoma, H. muscae, Draschia megastoma, Onchocerca cervicalis, Thelazia lacrimalis and Trypanosoma sp. Viral causes of conjunctivitis include equine adenovirus, equine herpesvirus types 1 and 2, equine infectious anemia, equine viral arteritis, and equine influenza type A2. The bacteria Moraxella equi, Streptococcus equi sp., equi, Rhodococcus sp., Actinobacillus sp. and Leptospira sp., and the fungi Aspergillus and Fusarium spp. can cause conjunctivitis in horses. Conjunctivitis can be seen with equine protozoal myeloencephalitis (EPM) (Brooks 2005, 2008; Gilger 2005; Brooks and Matthews 2007; Plummer 2008).

Equine conjunctivitis may also be found with systemic diseases such as polyneuritis equi, vestibular disease syndrome, African horse sickness, epizootic lymphangitis and neonatal maladjustment syndrome (Brooks 2005, 2008; Gilger 2005; Brooks and Matthews 2007; Plummer 2008).

Neoplastic causes of equine conjunctivitis include squamous cell carcinoma (SCC) (Fig 5), lymphoma (Fig 6), papilloma, haemangiooma, haemangiosarcoma, mast cell tumours (Fig 7), melanomas and multiple myeloma (Brooks 2005, 2008; Gilger 2005; Brooks and Matthews 2007; Plummer 2008). The prevalence of equine ocular SCC increases with age. White, grey-white and Palomino hair colour predisposes to ocular squamous cell carcinoma (Plummer 2008). The development of SCC has been associated with cell damage caused by the UV
component of solar radiation. Animals with higher levels of exposure to sunlight or that live in high altitudes are also more likely to develop SCC (Plummer 2008).

Signs of conjunctivitis

The horse conjunctiva has limited ways to react when inflamed (Brooks 2008; Plummer 2008). The clinical signs of conjunctivitis may be quite striking and include conjunctival hyperaemia, chemosis (oedema), and ocular discharge that is serous (viral, environmental/allergic) to purulent (bacterial). Conjunctival thickening from cellular infiltrates may be found with parasite invasion, dermoids and conjunctival tumours. Conjunctival lymphoma can masquerade or appear as conjunctivitis (Plummer 2008). Lymphoid follicles may form in some eyes (Gilger 2005; Brooks and Matthews 2007; Plummer 2008).

Differential diagnosis

Conjunctivitis is a nonspecific sign reflecting the eye’s limited mechanisms of response to injury (Brooks 2008; Plummer 2008). It is critical to differentiate primary conjunctivitis from conjunctivitis secondary to ocular or systemic disease. Conjunctivitis may be diffuse or nodular in appearance. Causes of nodular/mass lesions of conjunctiva include habronemiasis, squamous cell carcinoma, mastocytoma, haemangioma, haemangiosarcoma, papilloma and other neoplastic infiltrates, fungal granulomas, dermoids and foreign body reactions. Diffuse conjunctivitis in horses is found in primary conjunctivitis and conjunctivitis secondary to environmental irritants, intraocular inflammation and conjunctival neoplasia.

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Diagnostic procedures

Complete ophthalmic examination is indicated to identify adnexal and ocular causes of conjunctivitis, including a thorough adnexal examination, fluorescein staining and examination for signs of anterior uveitis. Cytological scrapings and biopsy and histological analysis may be necessary to identify causes of equine conjunctivitis. Culture and sensitivity of mucopurulent discharge should be performed if an infectious component to the conjunctivitis is suspected. Consider cannulation and flushing of the nasolacrimal duct to rule out nasolacrimal disease for horses with conjunctivitis (Plummer 2008).

Treatment

Treatment of conjunctival neoplasia may involve local resection with adjunctive beta-irradiation, brachytherapy, cryotherapy, radiofrequency hyperthermia or intralesional chemotherapy (Plummer 2008).

Conjunctival foreign bodies and debris can usually be removed with topical anaesthesia and liberal flushing of conjunctival fornices (Plummer 2008).

Parasitic conjunctivitis caused by habronemiasis and onchocerciasis can be treated with debridement of nodular lesions, and topical echinostome iodide, an ophthalmic antibiotic/corticosteroid medication if no corneal ulcers are present, and oral ivermectin or moxidectin (Plummer 2008).

Bacterial and fungal conjunctivitis can be treated with topical broad-spectrum antimicrobials initially with changes in therapy made after culture and sensitivity testing. Several antiviral medications are appropriate for treatment of horses with viral conjunctivitis. Conjunctivitis due to environmental irritants is treated with topical corticosteroids and a reduction in exposure to the inciting cause if possible (Plummer 2008).

Expected course and prognosis of equine conjunctivitis

Infectious conjunctivitis usually responds to appropriate treatment (Plummer 2008). Primary conjunctival infections respond well to topical therapy, usually within 5–7 days. Failure to respond or recurrence suggests an unidentified underlying cause (i.e. recurrent bacterial conjunctivitis associated with an unrecognised foreign body). Course and prognosis of conjunctival neoplasia depends on the specific type of neoplasia and the extent of invasion of surrounding tissues. Viral conjunctivitis may be recurrent. Environmental conjunctivitis is often difficult to eliminate completely due to the nature of the horse’s environment. The prognosis associated with conjunctivitis secondary to systemic or ocular disease varies with the specific disease. Many systemic diseases that have conjunctivitis as a clinical sign can have serious and life-threatening consequences (Plummer 2008).

Eosinophilic conjunctivitis and eosinophilic keratoconjunctivitis

Eosinophilic keratoconjunctivitis (EKC) has an unknown aetiology, but may be an immune-mediated disease (Brooks 2005, 2008; Plummer 2008; Brooks and Matthews 2007; Gilger 2005). Eosinophil invasion of the ocular surface can involve the cornea alone to form eosinophil keratitis (EK), the conjunctival alone to form eosinophilic conjunctivitis (EC) (Fig 8) as in the Wolfe et al. (2010) paper, or both the cornea and conjunctiva to cause EKC (Fig 9). All ages and breeds of horses can be affected, with many EKC cases reported in the spring. Clinical signs of EKC include corneal granulation tissue, blepharospasm, chemosis, conjunctival hyperaemia, mucoid discharge and corneal ulcers covered by raised, white, necrotic...
plasques (Plummer 2008). Corneal and conjunctival cytology typically contains numerous eosinophils (Fig 10) and a few mast cells. EKC resembles corneal or conjunctival tumours in appearance (Fig 11). The paper by Wolfe et al. (2010) documents equine EC without corneal involvement. It also identifies another form of conjunctivitis in the horse, and further characterises equine EKC.

Treatment for EK, EC and EKC can last months, as was found by Wolfe et al. (2010). Medical therapy in conjunction with superficial lamellar keratectomy for EK and EKC, or conjunctivalectomy for EC to remove the plaques significantly speeds healing. Topical corticosteroids and NSAIDs are beneficial in the early stages, but corticosteroids must be used cautiously if corneal ulcers are present (Brooks 2005, 2008; Gilger 2005; Brooks and Matthews 2007; Plummer 2008). Topical antibiotics, atropine (1%), and phospholine iodide (0.03% BID), in combination with systemic dexamethasone and NSAIDs are also effective for EK. Standard ivermectin antiparasite treatments 10 days apart can also be beneficial. Topical antibiotics, uveitis therapy and the mast cell stabilisers cromolyn sodium (Crolom 4%) and idoxamid (Alomide 0.1%) and the histamine H-1 receptor antagonists olopatadine HCl (Patanol 0.1%) and azelastine HCl (Optivar 0.05%) are used topically in recalcitrant EK cases (Plummer 2008). Caution should always be exercised with topical corticosteroid use in equine corneal disease. The confirmation of the diagnosis cytologically is critical to differentiate EK from other keratopathies such as squamous cell carcinoma, superficial fungal plaque, or stromal abscesses.
Manufacturers' addresses  
1Bausch and Lomb, Rochester, New York, USA.  
2Alcon, Ft Worth, Texas, USA.  
3Muro Pharmaceuticals, Tewksbury, Massachusetts, USA.

References  

NADA 141-186, Approved by FDA Veterinary Package Insert  

Surpass®  
(1% diclofenac sodium)  
Topical Anti-Inflammatory Cream  
For Use in Horses  

Caution: Federal law restricts this drug to use by or on the order of a licensed veterinarian.  

Dosage and Administration: Always provide the Client with surmountable instructions for Surpass topical cream.  

Surpass topical cream is white to pinkish-brown in color. Use Surpass topical cream at 1% concentration for topical application for up to ten days.  

Contraindications: Surpass topical cream is contraindicated in animals with known hypersensitivity to diclofenac.  

Adverse Reactions: The safety of Surpass cream has not been investigated in horses under one year of age.  

How Supplied: Surpass topical cream is white to pinkish-brown in color. It is supplied in a 10 gram tube for topical application.  

Storage Information: Store at up to 25°C (77°F). Protect from freezing.

Refer to the full prescribing information for complete details.

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hematological and serum biochemical baseline data before and periodically during treatment with any NSAID. Owners should be advised to observe for signs of potential drug toxicity (see Information for Owner or Person Treating Animal).  

Treatment with Surpass cream should be terminated if signs such as inappetence, colic, fecal abnormalities, anemia or depression are observed.  

As a class, NSAIDs may be associated with gastrointestinal and renal toxicity. When NSAIDs inhibit prostaglandins that cause inflammation, they may also inhibit prostaglandins that maintain normal homeostatic functions. These anti-inflammatory effects may result in critically significant disease in patients with underlying or preexisting disease more often than in healthy patients. Patients at greatest risk for renal toxicity are those that are dehydrated, on concurrent diuretic therapy, or those with renal, cardiovascular and/or hepatic dysfunction.  

Studies to determine the effect of Surpass topical cream when administered concomitantly with other drugs have not been conducted. Since NSAIDs possess the potential to induce gastric ulceration, concomitant use of Surpass cream with any other anti-inflammatory drugs, such as other NSAIDs and corticosteroids, should be avoided. Drug compatibility should be monitored closely in patients receiving concomitant therapy.  

The safety of Surpass cream has not been investigated in breeding, pregnant or lactating horses, or in horses under one year of age.  

Adverse Reactions: Adverse reactions include peracute, acute, subacute, and chronic reactions. Peracute reactions occur within a few minutes of administration and are associated with irritation of the skin and mucous membranes.  

Acute reactions include pain, swelling, and redness. Subacute reactions include lameness and joint effusion. Chronic reactions include decreased mobility, lameness, and joint effusion.  

The majority of patients with acute, subacute, or chronic reactions recover when the signs are recognized, drug administration is stopped, and veterinary care is initiated.  

Clinical Pharmacology: Diclofenac is a non-steroidal anti-inflammatory drug (NSAID) with analgesic properties. The mechanism of action of diclofenac, like other NSAIDs, is believed to be associated with the inhibition of cyclooxygenase activity.  

Effectiveness: In a controlled field study, 82 horses with osteoarthritis were treated with Surpass topical cream (42 horses) or placebo (40 horses). Lameness examinations were performed in horses with osteoarthritis associated with the tarsal, carpal, metacarpophalangeal, metatarsophalangeal and proximal interphalangeal joints.  


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