Glaucoma in Cats

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Incidence

The incidence of glaucoma in cats is much lower than dogs. According to the Veterinary Medical Data Base, 1 in 367 cats presented had glaucoma where as 1 in 119 dogs were affected. The clinical signs are not as obvious in the cat. Both the cornea and retina are more resistant to elevations in IOP. Therefore, corneal edema and early retinal and optic nerve damage are not detected. Buphthalmia is present in chronic cases but extremely buphthalmic globes may still be visual. This lack of early clinical signs accounts for the fact that an estimated 73% of glaucomatous eyes are blind on presentation.

Classification

Primary glaucoma is rare in the cat. It is usually bilateral and has been reported in Siamese, Persian, Burmese and domestic shorthair and longhair. Most cases are best classified as open angle as opposed to the goniodysgenesis seen in many dogs. These individuals are usually presented with buphthalmia, subluxated lens and decrease vision. Congenital open and closed angle glaucomas with multiple ocular defects are seen rarely as a bilateral disease, and then, primarily in the DSH. An autosomal recessive congenital glaucoma has been documented in the Siamese.

Feline aqueous humor misdirection syndrome (FAHMS) is a unique form of glaucoma seen in cats at an average age of 11.7 years. The reported incidence is greater in females and in my practice Persians are over represented. The typical affected globe has a dilated pupil with a sluggish PLR resulting in an anisicoria. The anterior chamber is extremely shallow. Frequently, an anterior capsule or cortical cataract is present. Severe case have significant myopia (-16.5 D). As in most cases of glaucoma in cats, corneal edema and episcleral injection are not present. Optic disc atrophy may be present but is difficult to detect in cats. A membrane develops posterior to the iris, preventing the normal flow of aqueous anteriorly resulting in the anterior displacement of the iris and lens. The inciting etiology is unknown.

Secondary glaucoma comprises 95%-98% of all glaucoma cases in cats. It is most frequently due to severe anterior uveitis. Lymphoplasmacytic uveitis (in most cases idiopathic) and secondary glaucoma is a common histopathological diagnosis. Diffuse iris melanoma and uveal lymphosarcoma are also common causes of secondary glaucoma in the cat.. Melanoma cases may be presented with a dark brown iris, irregular pupil, pigment on the anterior lens capsule and a buphthalmic globe. Lymphosarcoma is suspected when pink elevated iridal masses cause severe dyscoria, ectropia uveae and posterior synechia.

Diagnosis

A diagnosis of glaucoma cannot be made without the confirmation of an elevated IOP. The reported value will vary with the type of tonometer used. With the applanation tonometer (Tono-Pen XL) the reported value is 18.4 mmHg +/- 0.6. The rebound tonometer (TonoVet) gives an average pressure of 20.74 mmHg +/-0.5. Studies have suggested that the Tono-Pen yields false low pressures especially at IOP greater than 30 mmHg. Multiplying the Tono-Pen reading by 1.6 results in an IOP equivalent to the monometric value obtained during the study.

A definitive diagnosis of glaucoma cannot be made based on one borderline reading. This is especially true in the cat with their circadian rhythm in IOP. Normal cats can have an IOP 4-5 mmHg higher at night than in the morning. In cats with primary glaucoma, this value can increase to 8-32 mmHg in night time values. The IOP has also been found to be lower in cats over 7 years of age. Regardless of the time or instrument, a single value of 25 mmHg or a difference of 10 mmHg between the two eyes warrants consideration and reevaluation.

Special consideration should be given to interpreting readings in cases of anterior uveitis and secondary glaucoma. In anterior uveitis cases, the IOP should be below normal and the eye would be hypotensive. This is due to the decrease production of aqueous and normal aqueous outflow. A normal IOP in the face of aqueous flare indicates a decrease outflow and should be closely monitored and treated as a secondary glaucoma. This is especially true in the cat since 98% of the glaucoma cases are secondary.

Treatment

Cats with primary glaucoma are treated similarly to dogs, but they have less tolerance to drugs. Dichlorphenamide is used at a total dose of 12.5 to 25mg s.i.d. to b.i.d. Side effects include acidosis, lethargy, loss of appetite and weakness. Potassium replacement is frequently indicated in cats. Two topical CAIs, 2% dorzolamide (Trusopt®) and brinzolamide (Azopt®), have been used in cats t.i.d. Both drugs have been well tolerated with minimal adverse side effects. Dorzolamide is available as a generic and is in my opinion superior to brinzolamide. In one study, it reduced IOP by 45% when used t.i.d. Dorzolamide also reduces the night time elevation due to the circadian rhythm. Pilocarpine 1% and demecarium bromide (Wedgewood Pharmacy) are also used s.i.d. to b.i.d. but may cause local irritation and diarrhea. It has been suggested that the beta-adrenergic blocker (Timoptic® 0.5%) is more effective in cats than in

dogs. I have found no additional hypotensive effect from Timoptic over the CAI alone. It is also been found that beta blockers are not effective at night due to decrease sympathetic tone. They also may cause bradycardia, hypotension and bronchoconstriction. Latanoprost (Xalatan®) and similar prostaglandins should not be used in cases of FAHMS or most secondary glaucoma.

The treatment of secondary glaucoma is dependent on the etiology and potential for vision. In cases of anterior uveitis and glaucoma, the etiology of the uveitis should be identified and treated specifically when possible. Topical medication may include mydriatics and cycloplegics, corticosteroids, and NSAID. The use of topical corticosteroids (0.1% dexamethasone or 1% prednisolone) have been shown to cause a rise in IOP from 5-10 mmHg after 2-3 weeks of b.i.d. or t.i.d. treatment. The IOP returned to normal within 5-7 days when the medication was discontinued. This could be a concern in the management of chronic uveitis and secondary glaucoma. In selected cases of uveitis and glaucoma, I have added dorzolamide t.i.d. to reduce the production of aqueous. Changing corticosteroids or the route of administration may also be considered.

In cases secondary to neoplasia or irreversible blind painful eyes, surgery i.e. enucleation is the best treatment option. Twenty-nine per cent of the enucleation of cats submitted to COPLOW (Comparative Ophthalmic Laboratory of Wisconsin) were due to glaucoma. Also remember that 73% of glaucomatous cats are blind on presentation. Medical management is a life-long obligation and it is expensive.

Surgical procedures to control IOP and preserve vision are not as successful in the cat as in the dog. Cyclocryotherapy, cyclophotocoagulation, and gonio-implants have meet with little to no success in the cat. This is most likely due to the low percentage of primary glaucoma and the high incidence of secondary glaucoma caused by chronic uveitis. Intravitreal injection and evisceration with an intrascleral prosthesis are also seldom performed. This is due in part because of concern for the possible development of feline post–traumatic sarcomas.