

Short Communication

Incidence of corneal pathologies in dogs - A retrospective prevalence study

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ABSTRACT

The incidence of corneal pathologies was compiled for a period of two years from October 2015 to October 2017 by scrutinizing the hospital record of Ophthalmology unit, Department of Veterinary Surgery and Radiology, Madras Veterinary College Teaching Hospital. The rate of incidence of pathologies of the cornea was documented in terms of age, gender and breed of dogs. Incidences of corneal ulcers, descemetocoele, staphyloma, non-inflammatory keratopathies, corneal dystrophies and degenerations, pigmentary keratitis and chronic superficial keratitis were documented. Analysis of prevalence of corneal ulcers in dogs with two previous time frames from the same region were also elicited.

Keywords: Corneal ulcer, dogs, non -inflammatory keratopathy, pigmentary keratitis, corneal pathologies

INTRODUCTION

Corneal affections in dogs are common in clinical practice of canine patients. The range of corneal affections in dogs was documented including the various corneal pathologies and those with anterior corneal afflictions i.e. only including the epithelium and stromal layer. Corneal ulceration, or ulcerative keratitis, is one of the most common extra ocular disease identified in dogs. A corneal ulcer when present results in a break in the corneal epithelium that exposed the underlying corneal stroma (Slatter and Hakason 1993).

Clinical signs are varying degrees of lacrimation, blepharospasm, photophobia, conjunctival hyperemia, corneal oedema, and possibly miosis and aqueous flare and determined by the retention of topically applied fluorescein dye by the corneal stroma (Gelatt, 2000). A detailed ophthalmic examination with indirect ophthalmoscope revealed involvement of stroma which was confirmed with the help of fluorescein dye. (Miller, 2001). Glove and Constatinescuc (1997) reported that the cornea along with the lens focused light on to the retina to produce a combined refractive capacity of approximately 60 Diopter, out of which cornea accounts for 40 Diopter due to its curvature and high refractive index. Hence from the refraction point of view, corneal pathologies are to be treated with prime

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concern for restoring vision, preserving tectonicity and transparency of the cornea, controlling infection and in some cases, to salvage the globe. This document presents a retrospective study on the incidence of corneal pathologies in dogs at Madras Veterinary College Teaching Hospital, Chennai.

MATERIALS AND METHODS

Medical records and diagnostic ophthalmoscopic tests performed in dogs presented to the small animal ophthalmology unit of Madras Veterinary College, Chennai over a period of 24 months (Oct 2015-Oct 2017) for ocular affections were scrutinised. Incidence of various primary corneal pathologies in dogs with respect to age, breed and gender were documented. Analysis of prevalence of corneal ulcers in dogs with two different time frames from the same region was also done.

RESULTS AND DISCUSSION

The incidence of various corneal pathologies causing corneal affliction with reference to age, breed, gender, and involvement of one or both the eyes were analysed and presented. A total of 3027 dogs were presented to small animal Ophthalmology Unit with ophthalmological complaints during the aforesaid period out of which 1075 dogs (35.51%) dogs were related to corneal pathologies based upon routine ophthalmic diagnostic methods and the remaining 2852 (64.49%) were presented for other ocular pathologies at Madras Veterinary College Hospital. The percentage of dogs with bilateral corneal affections of non-inflammatory keratopathy was 13.34% and so mostly the affections

were unilateral. Slit lamp examination with slit beam and indirect ophthalmoscope revealed the depth of the pathology involved in the corneal layers. The number of cases with an intact endothelium and Descemet membrane or pathology extending until epithelium and/or stroma were 1039 i.e. 96.65%. They all had an intact anterior chamber with normal endothelium and Descemet membrane. Thus, most dogs had affections of anterior cornea or afflictions extending till the deep anterior lamellae alone. This suggests that there are adequate appropriate chances of improvement in vision, corneal transparency and tectonicity by anterior lamellar surgeries.

The commonest corneal pathologies documented were corneal ulcers (52.9%), pigmentary keratitis syndrome (18.79%), non-inflammatory keratopathy (17.95%), chronic superficial keratitis (6.33%), corneal dystrophies (1.12%), corneal degenerations (0.28%), keratomalacia (0.28%), corneal dermoid (0.09%), corneal cyst (0.28%), corneal perforation (0.74%), staphyloma (1.49%) and descemetocele (1.12%).

The frequently affected breeds of dogs were found to be Pugs (46.14) mostly, followed by Labrador retrievers (12.37%), Non-descript / native dogs (15.07%), Spitz (10.6%) and German Shepherd (3.44%). This higher incidence could be due to brachycephaly with shallow orbit housing a protruded eye ball. In addition, the hairs projecting from the facial fold, medial lower palpebral entropion and relatively low corneal sensitivity were also other attributing reasons. The increased incidence in pug breed in the present study when compared to a study done during 2002

and 2012 in the same unit could be due to increased popularity or prevalence of the breed. Mostly, young dogs of until three years of age (61.11%) were affected with corneal pathologies. This could be due to increased activity and playfulness along with reduced acquired or learned reflexes. Thus, the present study highlights the need for periodical ophthalmic evaluation in this breed especially within three years age group.

Ramani *et al.*, (2012) reported the presence of corneal ulcers in 526 dogs (14.4 %). This differed from the findings of Ancheril (2004) who reported that the year wise incidence of corneal ulcer was an average of 8.04%. Wilkie and Whittaker (1997) reported that older dogs appeared predisposed and yet dogs of any age could be affected. Moore (2003), had reported the corneal ulcer incidence was high in middle aged dogs with a mean age of 8.2 year. Ramani *et al.* (2012) found that in the age wise distribution, the dogs in the age group of three month to three year had the highest incidence of corneal ulcers (63.35%), 3-7 year age group had 21.7%, 7-10 year age group had 5.15% and 10-15 year age group had 9.3 % corneal ulcers.

Ramani *et al.* (2012) documented that the breed wise distribution of corneal ulcer was highest in Pugs (37.26%) followed by Spitz (26.7%) Non-Descript (16.7%) Boxer and Labrador both had the incidence rate of 4.94%, Terrier, (1.86%) Rottweiler, Great Dane & Pekingese had the incidence rate of 1.24% Dachshund, Bulldog, Beagle and Cocker Spaniel had 0.62% of the incidence rate. Ancheril, where has JM (2004) found that incidence of corneal ulcer

in Spitz (51.85%) Non-Descript (22.22%) Lhasaapso (7.41%) Great Dane, German shepherd, Pug, Bull terrier & terrier as 3.7%. Moore (2003) reported that corneal ulceration was observed in over 45 different breeds of dogs with Boxer being the most common breed with 24.56% incidence, followed by mixed breed 11.03%, but a high number of cases occurred in Poodles, Golden retrievers, Corgie, Labradors, Springer spaniel and German Shepherds.

Wilkie and Whittaker (1997) reported that dogs of any sex could be affected by corneal ulcer. Ramani *et al.*,(2012) reported the incidence rate to be 60.2% in males and 39.8 % in females during the period 2009-2011, whereas, Moore (2003) had reported that the per cent ratio of corneal ulcers as 54.67% in male dogs and 45.34% in female dogs. Ramani *et al.* (2012) reported that out of 526 dogs related to corneal pathology due to corneal ulcer 283 (53.8%) were bilateral and the remaining 243 (46.2%) were unilateral.

CONCLUSION

The reports from this study are significant in comparison with those of Ramani *et al.* (2012) and Ancheril (2004) as all were done from the same place of study, the Ophthalmology unit attached to the Teaching Hospital Complex of Madras Veterinary College in various time periods. Hence, changes in incidence of corneal pathologies, corneal ulcers in dogs and also in relation to various other affections can be compared to note the incidence with time from the same region. Thus, this is an appropriate prevalence study on the incidence of corneal affections in dogs.

Affections of corneal pathologies were found mostly to be confined to the epithelium and/or stroma (96.65%). Considering the importance of power of cornea in relation to visual acuity, anterior lamellar surgeries present a more pivotal role in improving the transparency of the cornea. Hence, an effective and timely diagnosis and treatment for abating such affections is the need of the hour in canine patients.

REFERENCES

Gelatt, K.N. (2000) Disease and surgery of canine cornea and sclera, *Vet. ophthalmology*, 700-725

Glove TD. And Constantinescu (1997) Surgery of Cataract. *Vet. Clin, North Am. Small Anim, Pract.*, 27:1143-1173

Ancheril, JM (2004) Efficacy Of Conjunctival Pedicle graft and Nictitans flap Techniques In The Treatment of Corneal ulcers in Dogs.

Miller, W.W, (2001) Evaluation and management of corneal ulcerations. *A systematic*

Moore, P.A., 2003. Diagnosis and Management of Chronic Corneal Epithelium defects (Indolent Corneal Ulceration). *Clin. Tech. small Animal. Pract.*, 18:168-177.

Ramani, C., Ahirwar, M. K., Shafuzama, M.d and Nagarajan, L. 2012. Incidence of corneal ulcer in dogs – A retrospective study. *Tamil Nadu J. Veterinary & Animal Sciences* 8 (5): 250-252.

Slatter, D. and N. Hakason (1993) Cornea and Sclera in Slatter D. (Edn) *Text Book of Small Animal Surgery. Edn II* W. B. Saunders company, Philadelphia pp., 1203-1225 .

Wilkie, D.A and C Whittaker (1997) Surgery of the cornea. *Vet. Clin, North Am. Small Anim, Pract.* 27:1067-1107.

Table 1 Incidence of common primary corneal pathological conditions in dogs

S.No	CORNEAL PATHOLOGY/ DIAGNOSIS	NUMBER	PERCENTAGE
1	Ulcerative keratitis or Corneal Ulcers	569	52.90
2	Pigmentary keratitis syndrome	202	18.79
3	Non-Inflammatory Keratopathy	193	17.95
4	Chronic superficial keratitis	68	6.33
5	Corneal dystrophies	12	1.12
6	Corneal lipid degenerations	3	0.28
7	Keratomalacia	3	0.28
8	Corneal Dermoid	1	0.09
9	Corneal Cyst	3	0.28
10	Corneal perforation	8	0.74

11	Staphyloma	16	1.49
12	Descemetocele	12	1.12

Table 2 Breed wise prevalence of corneal pathologies/affections

S.No.	BREEDS AFFECTED COMMONLY	NUMBER	PERCENTAGE(%)
1	GERMAN SHEPHERD	37	3.44
2	LABRADOR RETRIEVER	133	12.37
3	PUG	496	46.14
4	SPITZ	114	10.60
5	ND	162	15.07
6	OTHERS	133	12.37

Table 3 Age wise prevalence of ocular affections

S.No.	AGE GROUPS AFFECTED	NUMBER	PERCENTAGE(%)
1	0-3years	657	61.11
2	3-8 years	306	28.47
3	>8 years	112	10.42

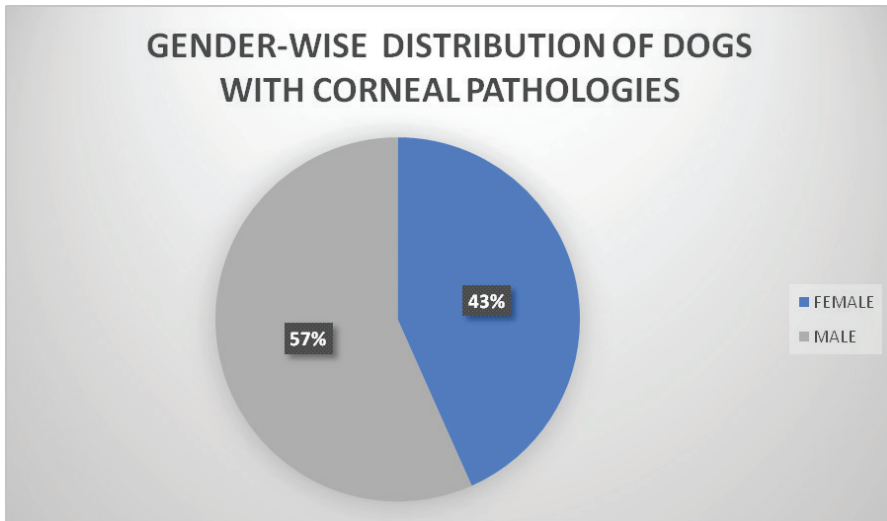
Table 4 Gender wise distribution of ocular affections

S.No.	GENDER	NUMBER	PERCENTAGE(%)
1	FEMALE	466	43.34
2	MALE	609	56.65

Table 5 Common corneal affections- distribution by number

Common Corneal Affections	BREED						GENDER		AGE (years)		
	GSD	Lab	Pug	Spitz	ND	Others	Female	Male	0-3	3-8	>8
Corneal Ulcer	7	31	266	35	56.	49	247	197	327	89	28
Pigmentary keratitis	1	2	129	6	6	7	90	61	69	69	13
Non-inflammatory keratopathy	17	82	48	55	62	56	182	138	180	97	43

COMMON CORNEAL PATHOLOGIES IN DOGS



<p>OS-Pigmentary Keratitis 5y, male, Pug</p>	<p>OS -Descemetocele 11 months, male, Pug</p>	<p>OD-Deep ulcerative keratitis- 3yr, female, Shih Tzu</p>
<p>OS-Non inflammatory keratopathy- 2y, female, Great Dane</p>	<p>OD- Corneal degeneration 10yr, female, Golden Retriever</p>	<p>OS-Chronic superficial keratitis- 2y, male, Shih Tzu</p>