Journal of Animal Research: v.15 n.01, p. 21-26. February 2025

DOI: 10.30954/2277-940X.01.2025.4

Prevalence and Pattern of Eye Affections in Canine Patients: A Retrospective Study

Akhilesh Verma, Surbhi K. Tyagi*, Vivak Malik, Rachna Thapliyal and Shubham Vikram Singh

Department of Veterinary Surgery & Radiology, College of Veterinary & Animal Sciences, SVPUAT, Meerut, U.P., INDIA

**Corresponding author: SK Tyagi; E-mail: surbhi.vet@svpuat.edu.in*

Received: 07 Nov., 2024 **Revised:** 14 Jan., 2024 **Accepted:** 22 Jan, 2025

ABSTRACT

This study aimed to assess the incidence of various eye affections in dogs at the VCC, College of Veterinary and Animal Sciences, over a 14-month period from June 2023 to August 2024. Out of 1,803 dogs presented to the surgical section, 34 dogs (1.8%) were diagnosed with ocular conditions, with corneal ailments affecting 24 dogs (70.59%). Thirty four dogs (50 eyes) presented with various eye conditions were included in the study. Breed analysis revealed that Pugs were the most affected (29.4%, 10 cases), followed by Shih Tzus (20.6%, 7 cases), mongrels (11.8%, 4 cases), and Pit Bulls and Golden Retrievers (8.8% each, 3 cases). Brachycephalic breeds exhibited a higher prevalence (58.8%, 20 cases) compared to mesocephalic breeds (41.2%, 14 cases). Males were slightly more affected (52.9%, 18 cases) than females (47.1%, 16 cases). Unilateral ocular affections were more common (52.9%, 18 cases) compared to bilateral involvement (47.1%, 16 cases, totalling 32 eyes). Anatomical evaluation of 50 affected eyes revealed the cornea as the most frequently involved structure (68%, 34 eyes), followed by the globe (14%, 7 eyes), third eyelid (8%, 4 eyes), eyelid (4%, 2 eyes), lens (4%, 2 eyes), and conjunctiva (2%, 1 eye). Clinical manifestations included corneal ulcers, descemetocele, melanosis, and other pathological conditions.

HIGHLIGHTS

- Study was conducted to assess the incidence of eye affections in dogs.
- Pugs were highly affected with eye infections.

Keywords: Brachycephalic breeds, Cornea, Corneal ulcer, dogs, Eye affections, Pigmentary keratitis

Eye diseases are a common health concern in dogs, often leading to discomfort, impaired vision, and a decline in their overall well-being. Among the various ocular conditions, corneal disorders are particularly significant due to their direct impact on vision and the potential for complications if not addressed in time. With the growing number of companion animals, driven by rapid urbanization and changing lifestyles, there is an increasing awareness among pet owners about their pets' health, including eye problems.

This retrospective study was conducted to assess the prevalence and patterns of eye affections in canine patients presented to the Veterinary Clinical Complex over a specific period. By understanding the frequency and types of these conditions, the study aims to provide insights that can help improve the diagnosis and management of ocular diseases in dogs.

MATERIALS AND METHODS

Incidence

The records of surgical cases referred to the Veterinary Clinical Complex (TVCC), College of Veterinary and Animal Sciences, Meerut, were reviewed to determine

How to cite this article: Verma, A., Tyagi, S.K., Malik, V., Thapliyal, R. and Singh, S.V. (2025). Prevalence and Pattern of Eye Affections in Canine Patients: A Retrospective Study. *J. Anim. Res.,* **15**(01): 21-26.

Source of Support: None; **Conflict of Interest:** None

the incidence of different corneal and ocular affections in canine patients over the study period (June 2023 to August 2024).

Ophthalmic Examination

Anamnesis

Detailed case histories were recorded, including breed, age, sex, type, and duration of the eye affection, along with any previous treatment. General health, concurrent diseases, and past therapies were also documented.

Gross examination

A thorough gross examination of the eye and its adnexal structures was conducted to identify any abnormalities. The globe was assessed for its size, position (enophthalmos, exophthalmos, or proptosis), direction (strabismus), and mobility (nystagmus). The eyelids were examined for conditions such as entropion, ectropion, macropalpebral or micropalpebral fissure, blepharitis, lacerations, tumors, blepharospasm, and ciliary disorders like distichiasis, trichiasis, or ectopic cilia. The third eyelid was inspected for protrusion of the gland, the presence of foreign bodies, scrolling, trauma, or neoplasia. The conjunctiva was evaluated for signs of congestion, inflammation, nodules, lacerations, or the presence of foreign materials. The cornea and sclera were carefully examined for ulceration, pigmentation, edema, vascularization, injuries, or tumors. The anterior chamber was assessed for changes in depth or the presence of abnormal materials such as hyphema or turbidity. The iris and ciliary body were evaluated for masses, alterations in color, and structural abnormalities. Finally, the lens was primarily examined for cataracts, or other visible abnormalities.

Neuro-Ophthalmological Examination

Reflexes were systematically assessed to evaluate the neuro-ophthalmological function of the patients. The palpebral reflex was tested by stimulating the eyelid skin and observing for a complete blink response, indicating normal reflex activity. The menace reflex was evaluated by making a sudden hand gesture near each eye while ensuring no physical contact, with a positive response observed as a blink. The pupillary light reflex (PLR) was assessed by directing a strong light beam into the eye and recording the involuntary contraction of the pupil as an indicator of proper reflex action. Additionally, the swinging flashlight test, a modified PLR test, was performed by moving a light source alternately between both pupils to observe dynamic and consistent pupil contraction.

Special Diagnostic Procedures

The Schirmer's Tear Test (STT) was performed by placing tear test strips in the conjunctival fornix for one minute to measure tear production. The results were categorized as normal, indicative of dry eye, or suggestive of epiphora based on the degree of tear wetting. The Fluorescein Stain Test was employed to detect corneal ulcers and epithelial defects. A fluorescein strip was gently applied to the eye, and the pattern of stain retention was examined under light to identify the presence and severity of corneal abnormalities.

RESULTS AND DISCUSSION

Incidence

Out of 1,803 dogs with surgical affections at TVCC, COVAS, 34 cases (1.8%) involved ocular conditions. In another study at the same institution, 64 out of 762 surgical cases (8.39%) were ocular affections (Kumar, 2023). Similarly, Sale *et al*. (2013) recorded a 1.39% incidence of eye conditions among surgical cases. The details of animals affected with various eye affections are given in the table 1.

Table 1: Incidence of ocular affections based on side, sex, age and breed (50 eyes)

Parameter	Particular	Number	%
Side	Unilateral	18	53
	Bilateral	16	47
	Total	**34**	**100**
Sex	Male	18	53
	Female	16	47
	Total	**34**	**100**

Age group (year)	0-1	14	41.1
	1-2.	5	14.7
	2-5.	10	29.4
	>5	5	14.71
	Total	**34**	**100**
Breed	Shihtzu	7	20
	Pug	10	29
	Pitbull	3	9
	Golden retriever	3	9
	Cocker spaniel	1	3
	Mongrel	4	12
	Pomeranian	2	6
	Labrador	2	6
	Beagle	2	6
	Total	**34**	**100**

Ophthalmic Examination

Anamnesis

Age

Ocular affections were most common in the 0–1-year age group (41%, n=14), followed by 2–5 years (29.4%, n=10) and 1–2 years and >5 years (14.7% each). Similarly, Kumar (2023) reported the highest incidence in dogs aged 0–1 year (31.25%, n=20), followed by 2–5 years (26.56%, n=17), >5 years (25%, n=16), and 1–2 years (17.18%, n=11). Kumar (2018) noted 51.7% of cases in 0–3 years and 36.7% in 3–6 years. Anoop *et al*. (2015) found 53% in 1–3 years, 30.9% in <1 year, 15% in >5 years, and 4% in 3–5 years. Young dogs, especially under 3 years, are consistently more affected.

Breed

Pugs had the highest incidence (29%, n=10), followed by Shih Tzus (20%, n=7), Mongrels (12%, n=4), Pit Bulls and Golden Retrievers (9%, n=3 each), and others. Brachycephalic breeds (58.8%) were more affected than mesocephalic breeds (41.2%). Similarly, Kumar (2023) reported the highest incidence in Pugs (23.43%), Beagles (17.18%), and Shih Tzus (15.62%). Pandey *et al*. (2018) noted non-descript breeds (38.62%) and Pomeranians (31.97%) as most affected. Brachycephalic breeds, like Pugs, are prone to ocular issues due to anatomical features like shallow sockets and bulging eyes.

Sex

Males (53%, n=18) were slightly more affected than females (47%, n=16). This aligns with findings from Mishra *et al*. (2021) (56.67% males) and Kumar (2018) (65% males). Pandey *et al*. (2018) recorded a more significant disparity (70.49% males). A higher tendency to keep male dogs may contribute to the difference.

Gross examination

Eye Affected

In the present study, unilateral ocular affection was more common (53%, n=18) than bilateral (47%, n=16). The right eye was affected more frequently (66.66%, n=30) than the left (33.33%, n=15). A similar trend was observed by Antonia *et al*. (2014), where right-sided ocular affection was more common (45.72%) than left (34.99%), and bilateral affection was 19.29%.

Part of Eye Affected

The detail of different parts of eye affected is given in the table 2 (Fig. 1). The cornea was the most commonly affected part (68%, n=34), followed by the globe (14%, n=7), third eyelid (8%, n=4), eyelids (4%, n=2), lens (4%, n=2), and conjunctiva (2%, n=1) (Table 2).

Table 2: Part of eye affected (50 eyes of 34 dogs)

Sl. No.	Part	Number	%
1	Cornea	34	68
2	Globe	7	14
3	Third eyelid	4	8
4	Eyelid	2	4
5	Lens	2	4
6	Conjunctiva	1	2
	Total	**50**	**100**

Mishra *et al*. (2021) reported that cataracts were most common (17.61%), followed by corneal ulcers (17.04%). Tripathi *et al*. (2020) found the highest incidence in cataracts (22%), followed by corneal opacity (19%). Pandey *et al*. (2018) noted cataracts (38.52%) and ulcerative keratitis (13.11%) as the most common conditions. Kumar (2018) observed melanosis and corneal ulcers (21.7% each) as the highest incidences in corneal affections.

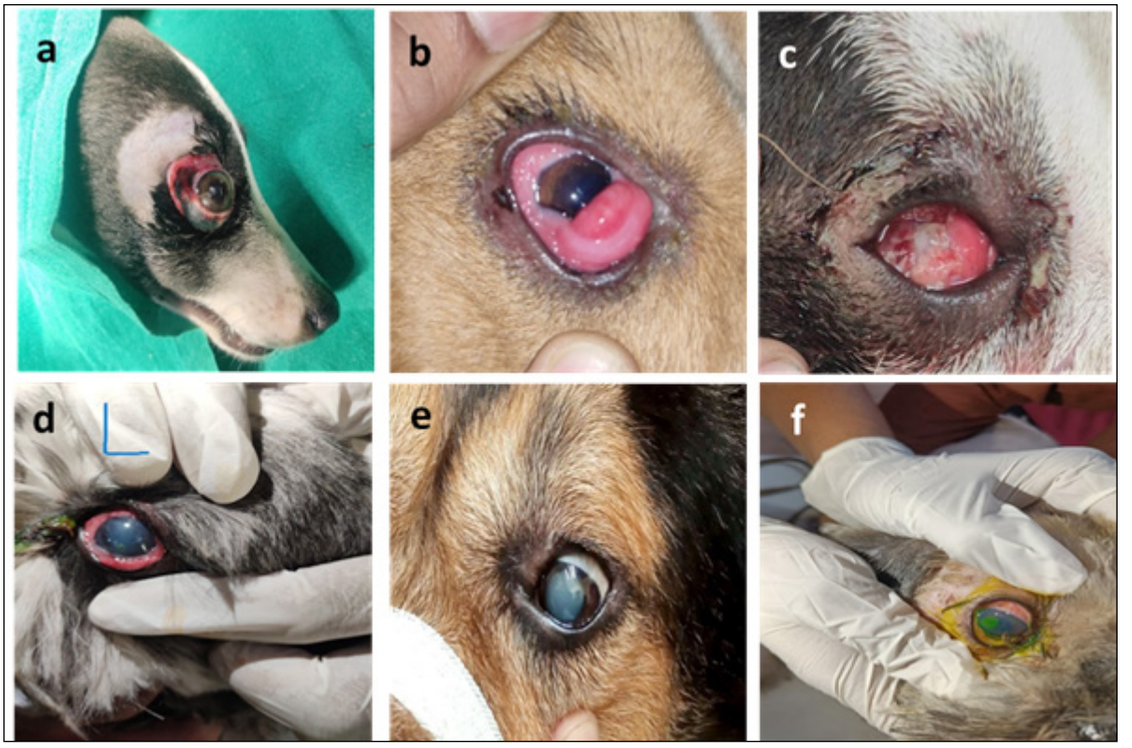

Fig. 1: Eye affections in dogs. **(a)** Traumatic proptosis of globe in a dog; **(b)** Cherry eye in a beagle; **(c)** Tumour of an eye; **(d)** Conjunctivitis in left eye in a cocker spaniel; **(e)** Cataract in a dog; **(f)** Corneal ulcer in a Shitzu

In other studies, corneal affections, including ulcers, opacity, and melanosis, were the most common (Dhruv, 2014; Kumar, 2018). In 643 cases, corneal affections accounted for 48.83%, followed by eyelid affections (14.93%) and conjunctival affections (11.66%) (Antonia *et al*., 2014). The cornea is particularly susceptible to damage due to its delicate structure, making it the most commonly affected ocular part.

Neuro-ophthalmic examination

A neuro-ophthalmic examination was conducted to assess visual responses and reflexes, focusing on cases with visual impairment.

Menace reflex

In this study, the menace reflex was tested on 34 eyes, with 79.4% (27 eyes) responding positively by blinking when a perceived threat approached, while 20.6% (7 eyes) showed a negative response. This reflex involves the optic nerve (cranial nerve II) sending visual signals to the brain, which triggers the facial nerve (cranial nerve VII) to activate eyelid muscles for protection. A negative menace reflex may indicate facial nerve paralysis, as explained by Shamir and Ofri (2007), or cerebellar dysfunction (Stiles *et al*., 1995). All 7 eyes with a negative menace reflex had positive palpebral reflexes, ruling out facial nerve issues.

Palpebral reflex

All 34 cases showed a positive palpebral reflex, where the eyelids closed upon gentle touch, indicating proper sensory and motor function. The trigeminal nerve (cranial nerve V) senses touch, and the facial nerve (cranial nerve VII) triggers eyelid closure. This reflex, tested after the menace reflex, confirmed healthy neurological function in the dogs. Negative menace reflexes were likely due to corneal issues rather than nerve damage.

Pupillary light reflex (PLR)

The PLR was evaluated in 34 eyes, with 41.2% (14 eyes) exhibiting a normal response, confirming the proper functioning of the optic (cranial nerve II) and oculomotor (cranial nerve III) nerves. However, 41.2% (14 eyes) lacked a reflex due to physical obstructions, such as corneal ulcers or descemetocele, which prevented light from reaching the retina.

In 8.8% (3 eyes), dense melanosis entirely blocked light, making reflex assessment impossible. Additionally, another 8.8% (3 eyes) showed no reflex, indicative of possible nerve dysfunction. These cases were diagnosed as positive for *Ehrlichia canis* infection and treated accordingly. Notably, the animals with an initially absent PLR demonstrated gradual improvement after seven days of treatment,

Swinging light reflexes

Similar to PLR, out of the 34 eyes tested, 41.2% (14 eyes) had a positive response, 8.8% (3 eyes) had a negative response, and 41.2% (14 eyes) were unresponsive due to corneal ulcers and descemetocele. In 8.8% (3 eyes), melanosis obstructed light. The Swinging Flashlight Test helps detect relative afferent pupillary defects (RAPD), indicating optic nerve damage or severe retinal disease.

Tapetal reflexes

The test was conducted in a dark room to enhance the accuracy of observations. Among the 34 eyes examined, 41.2% (14 eyes) displayed a positive tapetal reflex, indicating clear ocular structures, while 20.56% (7 eyes) showed a negative reflex. In the remaining cases, conditions such as corneal ulcers, descemetocele, and melanosis obstructed light transmission, preventing accurate assessment.

The tapetal reflex is an essential tool for retro-illumination, facilitating the visualization of transparent ocular structures like the cornea, lens, and vitreous. However, the presence of opacities can hinder the effectiveness of this method. Karpinski (2004) highlighted the value of retro-illumination in diagnosing ocular abnormalities, emphasizing the importance of clear media for optimal results.

In this study, a gradual return of the tapetal reflex was observed in cases where it was initially absent, correlating with improvements in the underlying ocular conditions.

Special diagnostic procedure

Schirmer's tear test

The Schirmer's Tear Test (STT) is an essential diagnostic tool to assess tear production and for diagnosing conditions like dry eye and KCS, where tear production is below normal. In this study, it was performed on 34 eyes with corneal conditions. The results showed that 85.3% (29 eyes) had normal tear production (15-25 mm/min), while 5.9% (2 eyes) had reduced tear production, indicating dry eye syndrome, and another 5.9% (2 eyes) had significantly low tear production, confirming keratoconjunctivitis sicca (KCS). One eye (2.9%) showed excessive tear production (epiphora).

According to Slatter (1990), a normal STT result is above 15 mm/min, while values below 10 mm/min suggest dry eye syndrome, with readings between 10-15 mm/min being inconclusive.

Comparing this study's findings with those of Kumar (2023) and Veith *et al*. (1970), some notable differences emerge. The current study found a higher proportion of normal tear production (85.3%) compared to Veith's study (8 eyes). Both studies showed a consistent 5.9% prevalence of KCS, but the current study found a significantly lower rate of epiphora (2.9%) compared to Veith's (44.8%). These differences could be attributed to variations in study design or populations or nature of cases presented.

Fluorescein dye test

Fluorescein staining remains a valuable tool for detecting corneal defects and ulceration. Fluorescein dye was applied to 23 cases suspected of corneal ulceration. Among these, 12 were positive for corneal ulceration, 2 for descemetocele, and 9 showed no signs of ulceration. Fluorescein is hydrophilic and binds to the exposed corneal stroma when epithelial defects or ulcers are present, making the affected areas appear green. Descemetocele, a deeper corneal defect, typically shows a central black or brownish region surrounded by fluorescein-stained periphery (Mezzadri *et al*., 2021).

In a similar study by Kumar (2023), fluorescein staining was used on 15 suspected cases of corneal ulcers. Of these, 7 tested positive for ulcers, while 8 were negative on the day of presentation. Ollivier (2003) have recommended using a wet strip of fluorescein applied to the bulbar conjunctiva rather than directly contacting the cornea, which can reduce potential errors in diagnosis.

CONCLUSION

The study highlights that corneal affections, particularly ulcerative keratitis and pigmentary keratitis, are the most common ocular conditions in dogs, with brachycephalic breeds like Pugs and Shih Tzus being most affected. Corneal issues were more frequent in dogs aged 2-5 years, with unilateral involvement being more common than bilateral. No significant sex-related differences were found, though other studies suggest varying trends

REFERENCES

Anoop, S., Devanand, C.B., Syam, K.V., Martin, K.M.J., Ajithkumar, S., Gleeja, L. and Ghosh, K.A. 2015. Pigmentary keratitis in dogs. *Indian J. Vet. Res.*, **24**(1): 31-33.

Antonia, N.A., Narayanan, M.K., Anoop, S., Devanand, C.B., Martin, J. and Venugopal, S.K. 2014. Occurrence of ophthalmic disorders in dogs. *Indian J. Vet. Res*., **23**(2): 21-24.

Dhruv, G. 2014. Studies on incidence, diagnosis and management of corneal affections in canine. Thesis submitted to Navsari Agricultural University.

Karpinski, L.G. 2004. The pre-purchase examination. *Vet. Clin. North Am. Equine Pract.,* **20**: 459.

Kumar, A. 2018. Diagnosis and management of cataract in animals. PhD Thesis submitted to CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur, India.

Kumar, A. 2023. Studies on ocular affection in dogs. Thesis submitted to Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250110 (UP).

Mezzadri, V., Crotti, A., Nardi, S. and Barsotti, G. 2021. Surgical treatment of canine and feline descemetoceles, deep and perforated corneal ulcers with autologous buccal mucous membrane grafts. *Vet. Ophthalmol*., **24**(6): 599-609.

Mishra, A., Shahi, A., Das, B., Dwivedi, P.K., Jawre, S., Singh, R. and Virendra, A. 2021. Incidence of ocular affections in dogs with special reference to corneal ulceration. *Bull. Mastiff*., **1**: 3-33.

Ollivier, F.J. 2003. Bacterial corneal diseases in dogs and cats. *Clin. Tech. Small Anim. Pract*., **18**(3): 193-198.

Pandey, P., Shahi, A., Kumar, D. and Shukla, M.K. 2018. Incidence of eye affection in dogs. *Indian J. Vet. Sci. Biotechnol*., **13**(4): 65-67.

Sale, M., Jhala, S., Parikh, P.V., Patil, D.B., Joy, N. and Ranpariya, J.J. 2013. Incidence of ophthalmic affections in dogs (2004-13). *Indian J. Vet. Surg*., **34**(1): 61-62.

Shamir, M.H. and Ofri, R. 2006. Comparative neuro-ophthalmology. *In:* Vet. Ophthalmology, 4th Edn. Blackwell Science, Philadelphia, pp. 378.

Slatter, D.H. 1990. Cornea and sclera. *In:* Fundamentals of Veterinary Ophthalmology, 2nd Edn. W.B. Saunders, Philadelphia. pp. 1386-1398.

Stiles, J., Carmichael, P., Kaswan, R., Bounous, D., Moore, A. and Hirsh, S. 1995. Reflexes in response to cerebellar trauma. *Vet. Comp. Ophthalmol*., **5**: 25-34.

Tripathi, D.M., Malik, V., Singh, A. and Pandey, R.P. 2020. Clinical, ultrasonographic evaluation, diagnosis and management of ocular affections in dogs. *Intas Polivet*, **21**(1): 164-172.

Veith, L. 1995. The Schirmer tear test in cats. *Mod. Vet. Pract*. **51**: 48.