



ISSN (E): 2277-7695
 ISSN (P): 2349-8242
 NAAS Rating: 5.23
 TPI 2022; SP-11(9): 1533-1535
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www.thepharmajournal.com
 Received: 02-07-2022
 Accepted: 07-08-2022

GA Vidhyashree
 Senior M.V.Sc, Department of
 Veterinary Surgery and
 Radiology, Veterinary College,
 Hebbal, Bengaluru, Karnataka,
 India

L Suresh
 Professor and Head, Department
 of Veterinary Surgery and
 Radiology, Veterinary College,
 Gadag, Karnataka, India

BN Nagaraja
 Professor and Head, Department
 of Veterinary Surgery and
 Radiology, Veterinary College,
 Hebbal, Bengaluru, Karnataka,
 India

KM Srinivasa Murthy
 Associate Professor, Department
 of Veterinary Surgery and
 Radiology, Veterinary College,
 Hebbal, Bengaluru, Karnataka,
 India

PT Ramesh
 Professor and Head, Department
 of Veterinary Medicine,
 Veterinary College, Hebbal,
 Bengaluru, Karnataka, India

NM Rajashailsha
 Associate Professor, Department
 of Veterinary Anatomy and
 Histology, Veterinary College,
 Hassan, Karnataka, India

Corresponding Author:
GA Vidhyashree
 Senior M.V.Sc, Department of
 Veterinary Surgery and
 Radiology, Veterinary College,
 Hebbal, Bengaluru, Karnataka,
 India

Incidence of corneal ulcer in dogs

GA Vidhyashree, L Suresh, BN Nagaraja, KM Srinivasa Murthy, PT Ramesh and NM Rajashailsha

Abstract

The present study was carried out among the dogs presented to the Veterinary College Hospital, Hebbal, Bengaluru during a period of one year from December 2020 to November 2021. The total number of dogs presented were 8635. Out of these, the number of dogs presented with ocular affections were 207. Among the dogs presented with ocular affections, 53 dogs had corneal ulcers. Majority of the dogs diagnosed with corneal ulcer were Shih Tzu (45.28%, 24/53), followed by Pug (30.19%, 16/53), Labrador Retriever (7.54%, 4/53), Pomeranian (5.66%, 3/53), Bull dog (3.77%, 2/53), Beagle (1.89%, 1/53), Rottweiler (1.89%, 1/53), Husky (1.89%, 1/53) and Boxer (1.89%, 1/53). The highest incidence of corneal ulcer was seen in dogs below three years of age (75.47%), followed by dogs aged 3 to 5 years (11.32%), 5 to 7 years (5.66%), 7 to 10 years (5.66%) and more than 10 years (1.89%). Gender-wise distribution of corneal ulcer was highest in males (52.83%, 28/53) than they were females (47.17%, 25/53).

Keywords: Corneal ulcer, ulcerative keratitis, schirmer tear test, fluorescein dye test

1. Introduction

Corneal ulceration or ulcerative keratitis is a very common ocular emergency in companion animal practice. Cornea of the dog was microscopically subdivided into 4 layers from external to internal were epithelium with basal membrane, corneal stroma which accounts for 90% of corneal thickness, descemet's membrane and posterior endothelium (Gelatt *et al.*, 2013) [3]. When the corneal epithelium breaks down, exposing the underlying corneal stroma, a corneal ulcer develops. Based on the depth corneal ulcers were classified as superficial, deep, descemetocoele and based on ease of healing classified as complicated, uncomplicated, refractory progressive (Moore, 2003) [7].

2. Materials and Methods

The present study was carried out in the Department of Surgery and Radiology, Veterinary College, Hebbal, Bengaluru, Karnataka.

2.1 Study period

The study was conducted for a period of 12 months from December 2020 to November 2021.

2.2 Screening

Vision function tests and direct ophthalmoscopic examination were performed on all the animals selected for the study irrespective of age, gender, and breed.

3. Results and Discussion

3.1 Incidence

The total number of dogs presented to the Department of Surgery and Radiology, Veterinary College, Hebbal, Bengaluru during a period were 8635. Out of these, the number of dogs presented with various ocular affections were 207 (2.39%). Corneal ulceration was ascertained in 53 (0.61%) dogs post screening (table 1).

Table 1: Incidence of corneal ulcers in dogs during December 2020 to November 2021.

Total number of dogs presented to department of VSR	Total number of ocular affections	Number of corneal ulcer cases out of total cases presented to department of VSR	Number of corneal ulcer cases among total ocular affections.
8635	207 (2.39%)	53(0.61%)	53 (25.60%)

Pandey *et al.* (2018) ^[10] reported the incidence of various eye affections in dogs as 1.39% and incidence of corneal ulcer was calculated to be 0.18%. Mishra *et al.* (2021) ^[6] reported the 0.38% incidence of corneal ulcers in dogs.

3.2 Breed-wise incidence of corneal ulcer in dogs

Breed wise incidence of corneal ulcer was highest in Shih Tzu (45.28%, 24/53), followed by Pug (30.19%, 16/53), Labrador Retriever (7.54%, 4/53), Pomeranian (5.66%, 3/53), Bull dog (3.77%, 2/53), Beagle (1.89%, 1/53), Rottweiler (1.89%, 1/53), Husky (1.89%, 1/53) and Boxer (1.89%, 1/53) (table 2). These observations were similar to the findings of Kim *et al.* (2009) ^[5] and Auten *et al.* (2020) ^[2], where the highest incidence was reported in Shih Tzu breeds. Ramani *et al.* (2012) ^[11], Sale *et al.* (2013) ^[13] and Mishra *et al.* (2021) ^[6] reported the highest incidence of corneal ulcer in pug breed of dog. This could be attributed to the higher popularity of the Shih Tzu breed in the city, and congenital predisposition to the corneal ulcers in brachycephalic breeds (Packer *et al.*, 2015) ^[9], and the inherent decreased corneal sensitivity and protrusion of the globe in brachycephalic dogs has a negative impact on the function of the cornea's protective mechanisms increasing the risk of traumatic injury (Hakanson and Merideth 1987) ^[4]. However, Pandey *et al.* (2018) ^[10] reported highest incidence in non-descriptive breeds.

Table 2: Breed-wise occurrence of corneal ulcer in dogs

Breed	Number of animals	Percentage
Shih Tzu	24	45.28
Pug	16	30.19
Labrador Retriever	4	7.54
Pomeranian	3	5.66
Bulldog	2	3.77
Beagle	1	1.89
Rottweiler	1	1.89
Husky	1	1.89
Boxer	1	1.89

3.3 Age-wise incidence of corneal ulcer

With regard to the age group, it was categorized into 0 to 3 years, 3 to 5 years, 5 to 7 years, 7-10 years and more than 10 years, the highest incidence of corneal ulcer was seen in dogs below three years of age (75.47%), followed by dogs aged 3 to 5 years (11.32%), 5 to 7 years (5.66%), 7 to 10 years (5.66%) and more than 10 years (1.89%) (table 3). Recorded observation was similar to the findings of Kim *et al.* (2009) ^[5], Ramani *et al.* (2012) ^[11], Akinrinmade and Ogungbenro (2015) ^[1], and Singh (2016) ^[14], which could be due to the less sensitive cornea and playful nature of young dogs made them more prone to ocular trauma. In contrast to this, Turner and Blogg (1997) ^[15] reported highest occurrence in the age group of 6.5 years. Wilkie and Whittaker (1997) ^[16] reports were of view that dogs of any age could be affected with corneal ulceration.

Table 3: Age-wise occurrence of corneal ulcer in dogs

Age	Number of animals	Percentage
0-3 years	40	75.47
3-5 years	6	11.32
5-7 years	3	5.66
7-10 years	3	5.66
More than 10 years	1	1.89

3.4 Gender-wise incidence of corneal ulcer

Gender-wise distribution of corneal ulcer was highest in males (52.83%, 28/53) and the remaining were females (47.17%, 25/53) (table 4). Similar findings have been reported by Moore (2003) ^[7] & Ramani *et al.* (2013) ^[12]. However, Wilkie and Whittaker (1997) ^[16] and Murphy *et al.* (2001) ^[8] reported no sex related incidence of epithelial defects and stated that dogs of any sex were equally prone to corneal ulceration.

Table 4: Gender-wise occurrence of corneal ulcer in dogs

Gender	Number of animals	Percentage
Male	28	52.83
Female	25	47.17

4. Conclusion

Corneal ulceration represents 0.61% of incidence among various ocular affections. Higher presentation of corneal ulcer was seen in male dogs below 3 years of age and among various breeds brachycephalic breeds mainly Shih Tzu breed of dogs were over represented with corneal ulceration.

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