



ISSN (E): 2277-7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2022; SP-11(5): 1178-1180  
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[www.thepharmajournal.com](http://www.thepharmajournal.com)

Received: 15-03-2022

Accepted: 18-04-2022

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## Antibiotic sensitivity and cultural pattern of bacteria in deep corneal ulcers in dogs

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### Abstract

20 cases of Deep corneal ulcers were studied for the isolation, identification and antibiogram of microorganisms associated with Deep corneal ulcers. Out of 20 cases 12 (60%) dogs were positive for microbial cultures and 8 (40%) did not exhibit any growth. In the positive cultures, 9 (75%) were Gram-positive and 3 (25%) were Gram-negative bacteria, respectively. The results of isolates were 7(58.34%), 3(25%) and 2(16.66%) of *Staphylococcus* spp., *E. coli* spp. and *Streptococcus* spp. Moxifloxacin 12(100%) is the most effective drug followed by Enrofloxacin 12(100%), Gentamicin 12(100%), Tobramycin 5(41.66%), Amoxicillin 5(41.66%) and Ofloxacin 5(41.66%).

**Keywords:** Deep corneal ulcer, antibiogram, microflora, sensitivity test

### Introduction

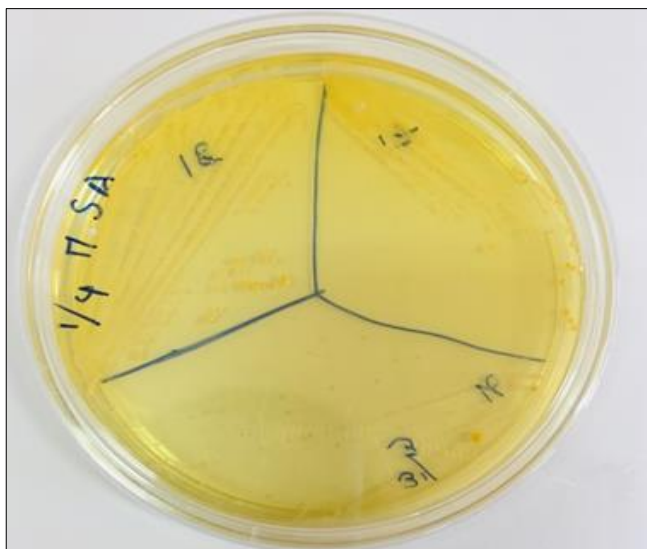
Corneal ulcers or ulcerative keratitis is one of the most common eye diseases in domestic animals, especially dogs. Although the corneal ulcer usually has a traumatic origin, it may rapidly become contaminated with bacteria<sup>[10]</sup>. The Deep corneal ulcer is characterized by a loss of corneal epithelium and activation of stromal fibroblasts, leading to swelling of the stroma and migration of inflammatory cells with a subsequently loss of corneal integrity and transparency<sup>[11]</sup>. Once the ulcer is infected, the healing process is retarded and can lead to an endophthalmitis or glaucoma<sup>[2]</sup>. Therefore, treatment with antibiotics must be initiated when corneal ulcers are diagnosed. The antibiotic therapy is selected based on the culture and susceptibility of antimicrobial tests of the isolated bacteria<sup>[5]</sup>. Therefore the aims of this study were to identify the microorganisms involved in corneal ulcers in dogs and their respective susceptibility to antimicrobials.

### Materials and Methods

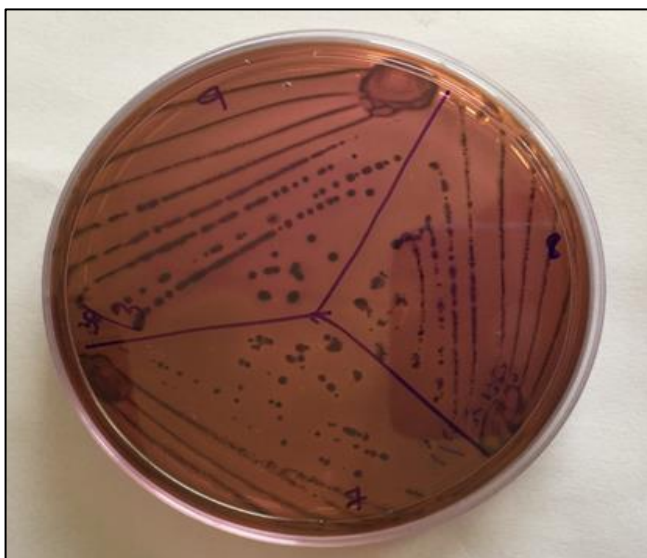
The dogs included in this study were subjected to clinical and Ophthalmic examinations, using a pen torch, Direct ophthalmoscope, Indirect ophthalmoscope and a Slit-lamp. Corneal ulcers were detected by fluorescein stain test. The clinical specimens were obtained from each corneal ulcer by corneal scraping after topical anesthesia with Propacaine 0.5%. The corneal swabs obtained aseptically from cornea of affected dogs were inoculated to the Brain Heart Infusion broth (BHI) and incubated at 37 °C for 24 hrs. After incubation a loopful BHI broth culture was streaked on BHI agar, Mac Conkey agar, Mannitol salt agar (MSA) plates aseptically. The plates were incubated at 37 °C for 24 hrs. The bacterial isolates were identified on the basis of cultural, morphological and biochemical characterization.

The BHI broth was inoculated with single sterile corneal swab and tubes were incubated at 37 °C for 24 hrs. The turbidity of BHI broth was adjusted to turbidity of Mac Ferland Nephelometer No.5 tubes. The broth culture was uniformly spread over Muller Hinton agar plates using sterile cotton swab. The inoculum was allowed to dry and antibiotic disc were then inoculated and observed after over-night incubation for zone of inhibition. The following antibiotics were tested for all the isolates: Moxifloxacin, Enrofloxacin, Gentamicin, Amoxicillin, Tobramycin and Ofloxacin. The diameter of zone of inhibition was recorded. The whole procedure was done by the standard technique<sup>[1]</sup>. Sampling for bacteriological studies was done on the day when case was reported at Veterinary Clinical Complex, Veterinary Hospital, Bhoiguda and Campus Veterinary Hospital, College of Veterinary Science, Rajendranagar, and Hyderabad.

**Results**



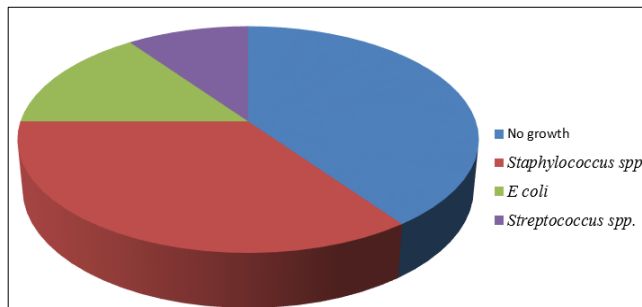
**Fig 1:** Appearance of yellow colonies of *Staphylococcus* spp. on MSA agar



**Fig 2:** Appearance of metallic sheen colonies of *E coli* on EMB agar



**Fig 3:** Antibiotic sensitivity test showing high sensitivity to Moxifloxacin in a dog with Deep corneal ulcer



**Fig 4:** 5Pie Chart Display of Microbial Isolates in Dogs Affected with Deep Corneal Ulcers

All 12 bacterial isolates revealed were identified on the basis of cultural characterization. Out of these 9(75%) were Gram positive and 3(25%) were Gram negative. Among these isolates major microorganism was *Staphylococcus* spp. 7(58.34%), followed by *E coli* spp. 3(25%) and *Streptococcus* spp. 2(16.66%). Moxifloxacin 12(100%) is the most effective drug followed by Enrofloxacin 12(100%) Gentamicin 12(100%), Tobramycin 5(41.66%), Amoxicillin 5(41.66%) and Ofloxacin 5(41.66%) [7]. reported that *Staphylococcus* spp. was more commonly identified bacteria.[4]in his findings reported that the most commonly isolated bacteria were *Staphylococcus* spp. (49%), *Pseudomonas aeruginosa* (7.6%), *Streptococcus* and *Corynebacterium* spp.(7% each) and *E. coli* (5.8%). [6] reported that the commonly isolated bacteria was *Staphylococcus* and *E. coli*. In his findings, the Gram-positive bacteria were predominant and susceptible to amikacin, ciprofloxacin, tobramycin, norfloxacin and amoxicillin + clavulanic acid. [3] found that the most frequent bacterial genera isolated were *Staphylococcus* spp. (32.3%).[9] observed bacterial growth in 100% of the samples and isolated *Staphylococcus* spp. [13] determined the bacteriogram of dogs affected with corneal ulcers and stated that 47.06%, 12.94% and 8.24% of *Staphylococcus*, *Streptococcus* and *Pseudomonas* spp., respectively from the corneal ulcers affected eyes. In their findings, *Staphylococcus intermedius* was the most predominant bacteria isolated [8] stated that *Staphylococcus intermedius* was the most predominant species. Further, antibiotic sensitivity test revealed Moxifloxacin antibiotics to be highly effective in the treatment of corneal ulcers. In the present findings Moxifloxacin was found to be most effective to which 100% isolates were sensitive. The second antibiotic that found to be more effective is Enrofloxacin. The present findings were supported by [12] stated that topical fluoroquinolones were effective in treating infected corneal ulcers or stromal abscesses, particularly infections involving Gram negative organisms.[9] in his study reported that Moxifloxacin antibiotics to be highly effective in the treatment of corneal ulcers.

**Conclusion**

Present study indicates that the most commonly isolated bacteria was *Staphylococcus* spp. followed *E coli* spp. and *Streptococcus* spp. Moxifloxacin is found to be most effective antibiotic to which 100% isolates were sensitive followed by Enrofloxacin.

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