Bacterial Eye Infection of Cats

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ABSTRACT

The aim of the present study is to identify clinical, characteristics, bacterial isolates, and their antimicrobial sensitivity in the cats presenting with suspected bacterial infection to aid selection of appropriate therapy. The study includes (60) examined cats from variable ages and both sexes. The result also indicates isolation of many species of bacteria.

The most common species are *Staphylococci spp*., *Corynebacterium spp*., *Bacillus spp*. and *Escherichia* coli, moreover *Pseudomonas spp*. *Proteus spp*., *Actionbacillus spp*. and *Niesseria spp*. Also the result shows difference in antibiotic sensitivity against the bacterial isolates in our study, the most of bacterial isolates are sensitive to ciprofloxacin and enrofloxacin.

KEY WORD: Bacteria, eye, cat, antibiotic sensitivity.

1. Introduction

Cat has become the most popular pet in the United States, yet statistics about the veterinary care for cats, remain troubling (1).

Eye infections are common in pet cats, effected the eyeball and surrounding areas

In some cases, the infection begins in only one part before spreading, while in others certain area of the eye will get infected(2).

All cats regardless of breed or gender are susceptible to conjunctivitis and the condition is not heritable (3). Primary ocular bacterial infections are associated with corneal, conjunctival and eyelid diseases, bacteria may be effected the nasolacrimal drainage apparatus and with intraocular infection occurring after penetrating injury or surgery (4). As well as bacterial infections may cause localized abscesses of glands in the eyelids or generalized infections of the eyelids (5). Moreover conjunctivitis, Belpharitis, Keratitis, Uveitis and style (6) furthermore, corneal sequestration are most common clinical problems in cat (7). Also the bacteria can get in the cat's eyes from the environment (8). There are several microorganisms that cats commonly carry, and the feline system's inflammatory immune response to these bacteria is responsible for the great majority of feline conjunctivitis cases (3). So the most representative groups of bacteria are *Staphylococci* observed by (9), the second group is hemolytic and nonhemolytic *Streptococci* (10), other genera in feline conjunctivitis such as *Pseudomonas spp.*, *Proteus spp*. and *Bacillus spp* (11).

2. Material and Methods:

2.1 Animals: (60) cats of different ages and both sexes from house cats and in different areas of Mosul and from veterinary hospital are examine clinically and bacteriologically.

2.2 Samples and bacteriological examination: Steriale swabs from both the right and left eye of each cats are subjected to microbiological examination (inoculated in to nutrient broth, transport directly to the laboratory, incubated 24 hours at 37□C, then culture on Nutrient agar, blood agar and MacConkey agar incubate at 24 hours at 37□C). Isolates are examined by using gram's stain method and biochemical tests according to standard laboratory method describe by [12].

2.3 Antibiotic sensitivity tests: isolates are active on nutrient broth at 37□C for 24 hours for antibiotics sensitivity test, transport by steriale swabs on Muller Hinton agar which specific for sensitivity test, fixe the disk on this agar than incubate in same condition, these according to[13], the antibiotics used include ciprofloxacin, gentamycin, chloramphenical, enrofloxacin, Ampicillin, Co-trimoxazol and colisitin.

3. Results:

Positive cultures are obtain from (47) isolates of the (60) sample (78.3%).

The most commonly bacterial isolates are *Staphylococcus spp*. (12/47, 25.53%), *Bacillus spp*. (11/47, 23.41%), *Corynebactreium spp*. (7/47, 14.89%), *E. coli* (5/47, 10.64%), *Pseudomonas spp*. (4/47, 8.51%), *Actionobacillus spp*. and *Proteus spp*. (3/47, 6.38%) and finally *Niesseria spp*. (2/47, 4.26%). [Table 1 Bacterial species isolates with percentage].

Table (1): Bacterial species isolates with percentage

Species	Number of isolates	%
Staphylococcus	12	25.53
Bacillus	11	23.41
Corynebacterium	7	14.89
E. coli	5	10.64
Pseudomonas	4	8.51
Actinobacillus	3	6.38
Proteus	3	6.38
Niesseria	2	4.26
Sum	47	100%

The results also show (5) species of *Staphylococcus* includes *Staph. aureus* (7/12, 58.4%), *Staph. saprophyticus* (2/12, 16.7%), *Staph. caprae*, *Staph. kloosi* and *Staph. ureolyticus* (1/12, 8.3%). [Table 2 species of *Staphylococcus* bacteria with percentage].

Species	Number	%	Coagulase	Oxidase	Catalase	Maltose	Sucrose	Lactose	D-Trehelose
Staph. aureus	7	58.4	+	-	+	+	+	+	+
Staph. saprophyticus	2	16.7	-	-	+	+	+	V	+
Staph. caprae	1	8.3	-	-	+	-	-	+	+
Staph. kloosi	1	8.3	-	-	+	-	+	+	+
Staph. ureolyticus	1	8.3	-	-	+	+	+	-	-
sum	12	100							

Table (2): Species of *Staphylococcus* bacteria with percentage

The bacterial isolates identify difference in antimicrobial sensitivity test against the bacterial isolates. [Table 3. The percentage of antimicrobial sensitivity test of bacterial isolates isolated from the cat's eyes].

Table (3): The percentage of antimicrobial sensitivity test of bacterial isolates isolated from the cat'eye

Species	Number	Gentamycin		Chloramphenicol		Enrofloxacin		Ciprofloxacin		Ampicillin		Colistin		Co-trimoxazol	
		no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%
Staphylococcus	12	9	75	9	75	3	25	9	75	2	16.6	0	8	8	66.6
Bacillus	11	10	90.9	4	36.3	10	90.9	10	90.9	0	0	8	10	10	90.9
Corynebacterium	7	6	85.7	3	72.8	3	42.8	7	100	0	0	6	2	2	28.5
Esherichia coli	5	0	0	4	80	2	40	2	40	0	0	1	3	3	60
Pseudomonas	4	2	50	1	25	2	50	2	50	0	0	1	1	1	25
Proteus	3	1	33.3	2	66.6	2	66.6	3	100	1	33.3	2	2	2	66.6
Actinobacillus	3	1	33.3	0	0	0	0	0	0	1	33.3	0	2	2	66.6
Niesseria	2	1	50	0	0	1	50	1	50	0	0	0	0	0	0

4. Discussion:

Eye infection are common in cats, but not necessarily deadly, it can spread and affect the internal parts of the eye if left untreated, thus severe cases often lead to blindness[2]. Gelatt describes the feline conjuctival and corneal surface as being generally colonize to a lower degree than in other domestic species [14]. In present study reveal that the percentage of isolation are (78.3%), lower rate are (59%) records previously by[15], so the variation of these rates occur due to a lot of factors can trigger an infection either irritation due to allergies or viral and bacterial infections, healthy cat is in contact with an infected cat especially in crowded environment, stressful environment like shelters, autoimmune diseases, other condition like eye trauma, cancer, or a systematic viral infection depending on the index of suspicion[2]. In addition to severe form of the disease can occur especially in combination with other upper respiratory tract pathogens, causing lymphadenopathy, sneezing, coughing and adventitious lung sounds [16].

Staphylococcus species are the most common microorganism isolate, this result agree with Kielbowicz et al[17] , and disagree with Kate et al[15]. Who records lower rate, these result justify to the opportunistic nature of *Staphylococcus* bacteria may lead to it take advantage of a weakened immune system and cause infection [18].

Bacteria belonging to *Staphylococcus* species in our study also records by[19], and the species of this bacteria including *Staphylococcus aureus,* which describe by[17], [16], and *Staphylococcus caprae* which describe by[7], as well as other species of *Staphylococcus* have not report earlier in feline conjunctiva or other eye infections of cat including *Staphylococcus saprophyticus*, *Staphylococcus klossi* and *Staphylococcus ureolyticus*, thus it justify to that *Staphylococous* infection may result when cat becomes injured, suffers an allergic reaction, or develops a weakened immune system for another reason[18].

Isolates assigned to *Bacillus spp*. were previously identified in cat's conjunctiva in our laboratory by microbiological means [17], *Corynebacterium* has been recognized as a cause of serious systemic and ocular infection, moreover, associated with conjunctivitis, keratitis and endophthalmitis in humans [20]. Several corneal ulcers are frequently infected with bacteria especially *Pseudomonas spp*.[4], so this bacteria is the most common bacterial pathogens in canine bacterial keratitis[15]. As well as the bacteria belong to *Neisseria* can be isolated *from* nasopharyngeal duct of cats and dogs.[21], also isolated from conjunctiva of cats[11].

To the best of our knowledge there are not reports on isolation of these species including *Escherichia coli*, and *Actinobacillus spp*. from cat conjunctiva, justify to their role in feline conjunctivitis, or keratitis was not recognized[7].

Based on antimicrobial sensitivity, *Staphylococcus spp*., *Bacillus spp*. and *Corynebacterium spp*. sensitive to gentamycin, this agree with[22], which also used chloramphenicol against the same bacteria, but these bacteria appear resistance against ampiallin because appearance of a new strains of these bacteria that is enough to resist ampicillin. *Pseudomonas spp*. resists to chloramphenicol and sensitive to ciprofloxacin, these results agree with [15].

because, these antibiotics regard as a new ophthalmic antibiotics and recently become commercially available[4], moreover the appearance of resistant of antibiotics against *Actionabacillus spp*. and *Neisseria spp.* due to reduce of isolation of these bacteria from eye of cats, as well as, variation in antibiotic sensitivity against the other bacterial isolates in our study because of eye infections are rarely treated using of oral medication[2], and in most cases treated only using of antibiotic eye drops or a tropical ointment[3], [23]. The prognosis depends on the stage and the seventy of the corneal ulceration, the etiology of the condition, and the therapeutic choice [24], [25].

As yet, the research about anitimicrobial sensitivity tests in bacterial eye infection in cat is very little, thus the present study shows the benefit ofuse of Antimicrobial drugs to treat the infected eye of cats with bacteria.

5. Conclusions:

Our study identified a new species of bacteria like *Escherichia coli*, *Neisseria spp*. and *Actinobacillus spp*. These species isolated newly from the effected eye of cats.

Moreover appearance of variation in antibiotic sensitivity against the isolated bacteria, so we should used the antibiotics infection of eye of cats not only the drops or ointment, in some sever cases need oral medication to treat these cases.

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Appendix. Biochemical test of Bacterial isolates from cats

Species	U	C	MR	VP	I	OX	Ca	Ni
Staphylococcus	+	V	V	-	-	-	-	+
Corynebacterium	V	-	-	-	-	-	V	-
Niessira	-	-	V	-	-	+	+	V
E. coli	-	-	+	-	+	-	+	+
Proteus	+	V	+	-	+	-	+	+
Bacillus	-	+	V	V	-	-	+	+
Actinobacillus	+	V	-	-	-	-	V	+
Pseudomonas	V	V	-	-	-	+	+	+