

# Antibiogram of Bacteria Belonging to Enterobacteriaceae Family From Canine Pyometra



## Veterinary Science

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**\* Dr. Litty Mathew**

Teaching Assistant, Department of Pathology, College of Veterinary and Animal Sciences, Pookode, Wayanad (Dt), Kerala, India. \* Corresponding author

**Dr. Shilpa P.**

Ph. D Scholar, Department of Microbiology, Madras Veterinary College, Chennai

**Dr. Koshy John**

Professor & Head, Department of Microbiology, CV & AS Pookode

### ABSTRACT

*The present study was conducted to isolate the bacteria belonging to Enterobacteriaceae family from canine pyometra samples and to find out the antibiotics which are effective against them. E. coli, Klebsiella pneumonia and*

*Proteus spp. were the bacteria identified. Antibiotics which are commonly used to treat bacterial infections like Amoxycillin, Ampicillin, Cephalexin, Ceftriaxone, Polymixin, Colistin, Chloramphenicol, Tetracyclin, Oxytetracyclin, Ciprofloxacin, Enrofloxacin, nitrofurantoin, Erythromycin and Gentamicin, were checked for susceptibility to assess the proper therapeutic measures and to find out the presence of multidrug resistant organism.*

### Introduction

Pyometra is a hormonally mediated diestral disorder characterised by cystic endometrial hyperplasia with secondary bacterial infection. Bacteria from the normal vaginal flora or subclinical urinary tract infections like that of *Enterobacteriaceae* family are the likely source of uterine contamination. In this family, *E. coli*, *Enterobacter* (Gibson *et al.*, 2008), *Klebsiella*, *Salmonella* and *Proteus* (Maity *et al.*, 2009) were reported to cause pyometra. The present study was conducted to find out the significance of Enterobacteriaceae in the pyometra and its antibiotic sensitivity as the indiscriminate use of antibiotics leads to the selection of resistant strains.

### Materials and Methods

In the present study, 17 canine pyometra samples were analysed which were brought to the department of Microbiology, College of Veterinary & Animal Sciences, Pookode. Isolation of bacteria was done by standard bacteriological procedures (Cruickshank *et al.*, 1975). Gram negative bacilli were further identified by using character differentiation tables given by Edwards and Ewing (1972) and Bergey's manual of determinative bacteriology (1974). For *in vitro* drug sensitivity study of the bacterial isolates, the procedures given by Bauer *et al.*, (1966) was followed. Single disc diffusion method was done using Muller Hinton Agar and antibiotic discs from Himedia Laboratories Pvt. Ltd. Bombay, 400 086, India. The antibiotic discs (concentration of antibiotics mentioned in parenthesis) applied are as shown in Table 1.

### Results & Discussion

Out of 17 samples, 12 were caused by bacteria belongs to Enterobacteriaceae family and one was of mixed bacterial infection. The cultural plate showing mixed infections was discarded and those of pure colonies were used for isolation, identification and antibiogram. Of these, seven were *E. coli* isolates, four were *Klebsiella*, and one was of *Proteus* spp. The drugs commonly used to treat bacterial infection were checked for susceptibility. Amoxycillin, Amoxycillin and clavulanic acid, Cephalosporins, potentiated sulphonamides etc. are the drug of choices for the treatment of canine pyometra. (Baithalu *et al.*, 2010).

In the present study, all the seven *E. coli* isolates were resistant to Amoxycillin, Ampicillin, Polymixin B, Colistin, Nitrofurantoin and Erythromycin. More than half of the isolates were resistant to Cephalexin (n=4), Ceftriaxone (n=6) and Gentamicin (n=6). So these drugs are not indicated in treatment of pyometra caused by *E. coli*. On the other hand, three isolates were resistant to Chloramphenicol and two each against Tetracyclin, Oxytetracyclin, Ciprofloxacin and Enrofloxacin. These observations were in accordance with those of previous studies (Tadesse *et al.*, 2012;

Collignon, 2009).

All the four isolates of *Klebsiella pneumonia* samples showed resistance to Amoxycillin, Ampicillin, Polymixin B, Colistin, Nitrofurantoin and Erythromycin. Three isolates were resistant to Gentamicin and two isolates were susceptible to Cephalexin. One isolate each was resistant to Ceftriaxone, Chloramphenicol, Ciprofloxacin and Enrofloxacin. All the isolates were susceptible only to Tetracyclin and Oxytetracyclin. Similar findings were observed by Du *et al.* (2014).

The *Proteus* isolate was resistant to Amoxycillin, Ampicillin, Polymixin B, Colistin, Nitrofurantoin and Erythromycin and showed susceptibility to Cephalexin, Ceftriaxone, Chloramphenicol, Tetracyclin, Oxytetracyclin, Ciprofloxacin, Enrofloxacin and Gentamicin. There are many reports about the resistance of *Proteus* spp. to Ampicillin, Tetracycline, Chloramphenicol, Co-Trimoxazole, Cefpiramide and Cephalothin (Feglo *et al.*, 2010; Bahashwan and El Shafey, 2013). Attention should be paid to the increasing use of these antibiotics against *Proteus* spp. which will result in development of multidrug resistance.

### Summary

From the present study, it can be concluded that Enterobacteriaceae in pyometra were most sensitive to Tetracyclin and Oxytetracyclin (83.33%), followed by Enrofloxacin and Ciprofloxacin (75%) and Chloramphenicol (66.67%). 50 % isolates were susceptible to Cephalexin, whereas only 16.6% were susceptible to Ceftriaxone. Only 25 % were susceptible to gentamicin. On the other hand, none of the isolates were sensitive to Amoxycillin, Ampicillin, Polymixin B, Colistin, Erythromycin and Nitrofurantoin.

**Table 1: Antibiogram sensitivity and resistance profile of Enterobacteriaceae sp. against different antibiotics**

Sl. No.	Name and concentration of antibiotic	E. coli (n=7)		K.pneumonia (n=4)		Proteus sp. (n=1)		Overall Sensitivity %	Overall resistance %
		Susc	Resistant	Susc	Resistant	Susc	Resistant		
1	Amoxycillin (10 mcg/disc)	0	7	0	4	0	1	0	100
2	Ampicillin(25 mcg/ disc)	0	7	0	4	0	1	0	100

Sl. No.	Name and concentration of antibiotic	E. coli (n=7)		K.pneumonia (n=4)		Proteus sp. (n=1)		Overall Sensitivity %	Overall resistance %
		Susc	Resistant	Susc	Resistant	Susc	Resistant		
3	Cephalexin (30 mcg/disc)	3	4	2	2	1	0	50	50
4	Ceftriaxone (30 mcg/disc)	1	6	0	1	1	0	17	83
5	Polymixin B(300units/disc )	0	7	0	4	0	1	0	100
6	Colistin (10 mcg/disc)	0	7	0	4	0	1	0	100
7	Chloramphenicol (30mcg/disc)	4	3	3	1	1	0	67	33
8	Tetracyclin (30 mcg/disc)	5	2	4	0	1	0	83	17
9	Oxytetracyclin (30 mcg/disc)	5	2	4	0	1	0	83	17
10	Ciprofloxacin(10 mcg/disc)	5	2	3	1	1	0	25	75
11	Enrofloxacin(10 mcg/disc)	5	2	3	1	1	0	25	75
12	Nitrofurantoin (100mcg/disc)	0	7	0	4	0	1	0	100
13	Erythromycin(15 mcg/disc)	0	7	0	4	0	1	75	25
14	Gentamicin (10 mcg/disc)	1	6	1	3	1	0	75	25

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