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Antibiotic sensitivity and cultural pattern of bacteria in canine pyometra

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Abstract

Twelve cases pyometra in bitches were studied for the isolation, identification and antibiogram of microorganisms associated with pyometra. Out of total bacterial isolates 66.66% were Gram positive and 33.33% were Gram negative. Among these isolates major microorganism was *Escherichia coli* species. Other microorganism isolated were Staphylococci 33.33% and non-lactose fermenter 16.66%. Enrofloxacin was the most effective antibiotic (66.66%), followed by Gentamycin (58.33%) and Amoxicillin sulbactam (50%), where as 58.33%, 66.66% of isolates were intermediate to Ceftriaxone, Cefoperazone respectively, where as 66.66%, 75% of isolates were resistant to Penicillin-G, Methicillin respectively.

Keywords: Canine pyometra, antibiotic, antibiogram, microflora, sensitivity test

Introduction

Pyometra is a common disease which is mostly in middle and old age bitches with absence of pregnancy. Progressive thickening of endometrium by repeated exposure to estrogen and cystic endometrial hyperplasia in successive heat cycles by progesterone making the bed highly favorable for pathogens. The cervix remains open during pro-estrus and estrus which allows normal flora present in vagina to ascend into the uterus. The bacterial colonies in thickened uterine lining are not expelled out and antibiotics cannot diffuse into the sea of pus in bacteria filled uterus [16]. The toxic state shows severe affects on the function of several organs like bone marrow, kidney, liver etc. [8]. Symptomatic treatment may give temporary relief but may reoccur and changes of antibiotics for several times invite antibiotic resistance and death. Identification of causative organism is done by isolation and selection of antibiotics of choice by antibiotic sensitivity test (AST).

Materials and methods

The vaginal swabs which were collected from pyometra affected bitches were inoculated on 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 vaginal 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 spread uniformly 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 diameter of zone of inhibition was recorded accordingly. The antibiotic which show more diameter of zone of inhibition is taken as antibiotic of choice for the treatment. The whole procedure was done by the standard technique [2]. Sampling for bacteriological studies was done on the day when case was reported at Veterinary Clinical Complex, College of Veterinary Science, Rajendranagar, and Hyderabad.

Results

All 12 bacterial isolates revealed were identified on the basis of cultural characterization. Out of these 8 (66.66%) were Gram positive and 4 (33.33%) were Gram negative. Among these isolates major microorganism was *Escherichia coli* 50% species.

Other microorganism isolated were Staphylococci 33.33% and non-lactose fermenter 16.66%. Enrofloxacin was found to be most effective antibiotic (66.66%), followed by Gentamycin (58.33%) and Amoxicillin sulbactam (50%),

where as 58.33%, 66.66% of isolates were intermediate to Ceftriaxone, Cefoperazone respectively, where as 66.66%, 75% of isolates were resistant to Penicillin-G, Methicillin respectively (Table No 1) (Fig 1, 2 and 3).

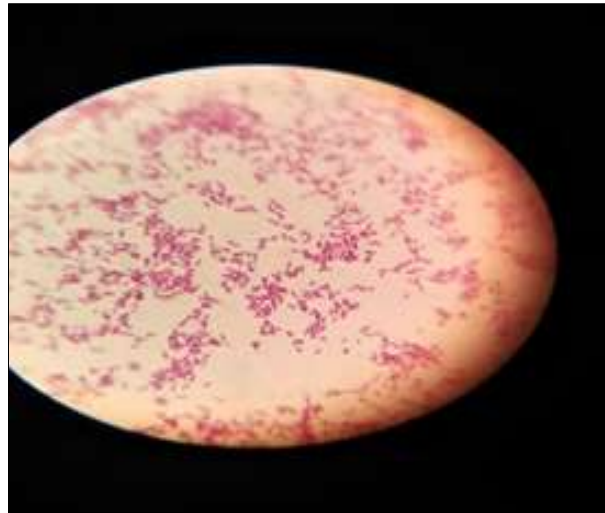


Fig 1: *E. coli* by Grams staining

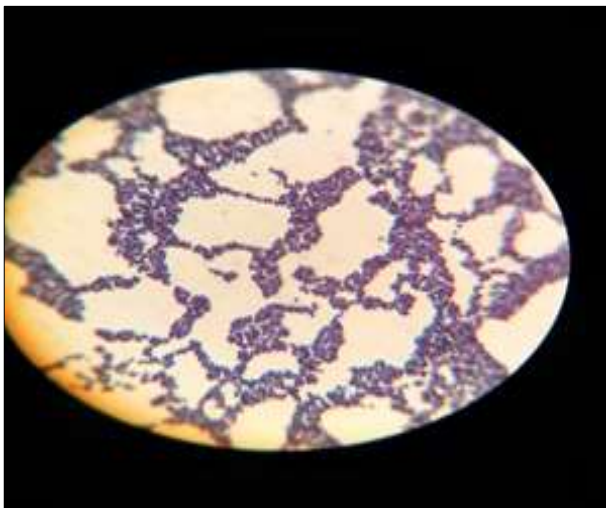


Fig 2: *Staphylococcus* spp. By Grams staining

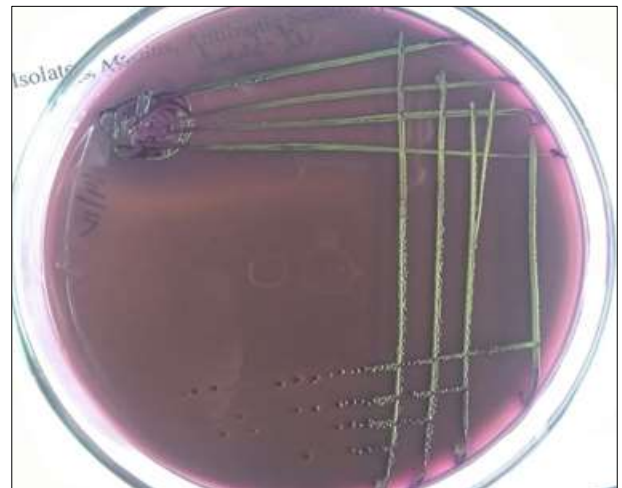


Fig 3: *E. coli* organism results in metallic green sheen on EMB agar

Table 1: Degree of Sensitivity of uterine discharge to different antibiotics

Antibiotics	Symbol	Conc.	Sensitivity (%)	Intermediate (%)	Resistant (%)
Enrofloxacin	EX	10µg	8 (66.66%)	2 (16.66%)	1 (8.33%)
Gentamycin	GEN	50 µg	7 (58.33%)	4 (33.33%)	1 (8.33%)
Amoxicillin sulbactam	AMS	30 µg	6 (50%)	5 (41.66%)	1 (8.33%)
Ceftriaxone	CTR	30 µg	--	7 (58.33%)	1 (8.33%)
Cefoperazone	CPZ	30 µg	--	8 (66.66%)	2 (16.66%)
Methicillin	MET	10µg	--	--	9 (75%)

Discussion

In present study Enrofloxacin was found to be most effective antibiotic to which 66.66% isolates were sensitive. The present findings are supported by the report of [9, 1] who observed that Enrofloxacin was most effective against majority of isolates. The second antibiotic was found to be Gentamycin to which 58.33% isolates was sensitive. Similar observations are made by [12] who reported that sensitivity of Gentamycin was 50% [5]. Also stated that Gentamycin was one of the most effective antibiotics [15]. Reported that sensitivity of Gentamycin was 97.63% [4, 7]. Reported that *Escherichia coli* and *Staphylococcus aureus* were among the

major organisms isolated [10]. Found that *Staphylococcus spp.* was the predominant bacteria (44.19%) among 43 canine pyometra cases screened in veterinary clinics. All the isolates were sensitive to Enrofloxacin, Gentamycin, Ciprofloxacin and Ceftriaxone. [14] Among 234 genital swabs which were collected from canine genital infections including pyometra 98 (41.8%) yielded *Escherichia coli* strains [11]. Observed that the antibiotic sensitivity pattern to field isolates of *E. coli* showed considerable variation in sensitivity and resistance pattern [3, 13, 6]. Stated that *Escherichia coli* were predominant and most frequent bacterial isolate from pyometra affected bitches.

Conclusion

The present investigation it is concluded that most of the organisms associated with pyometra is Gram positive. Among all the organisms *Escherichia coli* was found predominant followed by Staphylococci. Antibiotic sensitivity test revealed that Enrofloxacin was most effective antibiotic followed by Gentamycin and Amoxicillin sulbactam, whereas most intermediate to Ceftriaxone followed by Cefoperazone, whereas most resistant antibiotic was Penicillin-G followed by Methicillin.

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