

Incidence of Pyometra and Antibiotic Sensitivity of Genital Discharge in Bitches

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Abstract

The present study was conducted on clinical cases of bitches presented at College of Veterinary Science and Animal Husbandry, Anjora, Durg, Chhattisgarh bitches (n=18) with the history of vomiting, off feed and foul-smelling vaginal pus discharge. The cases were diagnosed as pyometra thorough clinical examination and confirmed through ultrasonography. The antibiotic sensitivity vaginal swab samples were carried out by standard disc diffusion technique. The incidence of pyometra was higher (61%) in bitches above 5 years of age than bitches upto 5 years (39%) of age. Highest incidence of pyometra occurred in bitches of Non-descript and Pomeranian (28%). Moreover, Nulliparous bitches were having highest incidence of pyometra (61%) cases followed by primiparous (28%) and pluriparous (11%) bitches. The highest numbers of vaginal samples were sensitive and resistant to Ceftriaxone (67%) and Tetracycline (58%), respectively. In conclusion, incidence of pyometra is largely affected by age, breed and parity of the bitch.

Keywords: Age, Antibiotic Sensitivity, Bitch, Breed, Incidence, Parity, Pyometra

Introduction

Canine pyometra is a common reproductive disorder of intact diestral bitches (Baithalu *et al.*, 2010). The disease shows subtle changes, making diagnosis a challenge in early stages. However, in advance cases, the condition is potentially life-threatening as it manifest systemic inflammatory syndrome (Singh *et al.*, 2020a). The disease affects on an average 19 per cent of all intact bitches before 10 years of age (Jitpean *et al.*, 2012). Approximately 20 per cent are diagnosed at an older age (Jitpean *et al.*, 2014), leading to a slightly higher lifetime proportion. Incidence of pyometra is more in nulliparous bitches and bitches older than 4 years of age (Niskanen and Thrusfield, 1998). Breed strongly influences the risk of developing pyometra, which indicates that genetic factors may contribute to an increased or decreased susceptibility in certain breeds (Jitpean *et al.*, 2012; Niskanen and Thrusfield, 1998). Pyometra cases were noted more in smaller breeds were affected more than the large breeds of dogs (Kashi *et al.* 2009). The pathogenesis of pyometra is partly understood. Moreover, progesterone hormonal imbalance results primarily endometrial proliferation and uterine glandular secretions, decreased myometrial contraction and induce closure of the cervix (Smith, 2006). In addition, progesterone has an inhibitory effect on the leucocytic activity in the uterus, adding support to a bacterial infection and facilitates bacterial adherence, colonization and growth (Noakes *et al.*, 2001). *Escherichia coli* is the pathogen most commonly isolated from bitches with pyometra (Hagman and Kuhn, 2002). Ideally, identification and sensitivity of the organism should be determined from vaginal discharges before initiating any antimicrobial treatment. The systemic studies on pyometra in different breeds of bitches are limited in Chhattisgarh. Therefore, the present study was undertaken in bitches affected with pyometra.

Materials and Methods

The present study was conducted on clinical cases of bitches presented at Veterinary Gynaecology and Obstetrics Department and Teaching Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Anjora, Durg, Chhattisgarh. Bitches (n=18) with the history of vomiting, off feed and in some cases foul smelling vaginal pus discharge. Based on the history, clinical signs and per-vaginal examination, the cases were tentatively diagnosed as pyometra and confirmed through ultrasonography (Singh *et al.*, 2018). The incidence of pyometra was studied on the basis of age, breed and parity. The bitches were treated accordingly.

Antibiotic Sensitivity Test (AST)

Bitches (n=12) were adequately restrained and the peri-vaginal area was scrubbed with an antiseptic, sterile cotton swab sticks were passed into the vagina with the help of vaginal speculum. The stick was directed cranio-dorsally initially (avoiding the clitoral fossa and the urethral orifices) and then longitudinally through a length of about 12 cm (Baba *et al.*, 1983). The swab was then rolled around the vaginal wall gently and withdrawn carefully into its adequately labeled sterile container for transport to the laboratory. The antibiotic sensitivity pattern of vaginal swab samples of bitches of were carried out before initiation of treatment by standard disc diffusion technique (Bauer *et al.*, 1966). The processed vaginal swab samples were inoculated into the nutrient broth and incubated at 37°C till the turbidity matched with barium sulphate standard and then the culture in the nutrient broth were seeded on fresh Muller Hinton agar plates. Antibiotic discs (Hi Media Laboratories Ltd., Bombay) were carefully placed on seeded Muller Hinton agar plates and pressed gently with forceps. The discs were placed at a minimum distance of 15 millimeter from the edge of plate and also from each other to avoid overlapping of the zone of inhibition. The plates were allowed to settle at room temperature for 30 minutes and incubated at 37°C for 16 to 18 hours. The antibiotic sensitivity of the vaginal swab samples were assessed by measuring the zone of complete inhibition around the disc. Based on the diameter of zone of inhibition, the sensitivity pattern of microorganisms to antibiotics was identified as sensitive or intermediate or resistant. Each vaginal swab samples from all the bitches were subjected to sensitivity test using standard discs of seven antibiotics (Amoxicillin/Clavulanic acid-30mcg, Ceftriaxone-30mcg, Ceftriaxone/Tazobactam-80/10 mcg, Gentamicin-50 mcg, Enrofloxacin-10 mcg, Ofloxacin-2 mcg and Tetracycline-10 mcg). The diameter of zone of inhibition was recorded by using a Hi-media scale.

Results and Discussion

Age wise Incidence

The incidence of pyometra was higher (61%) in bitches above 5 years of age than bitches upto 5 years (39%) of age (Table 1). In the present study, pyometra was found to be a disease primarily affecting bitches which were in the

age group of 6-11 years which is in conformity with the reported age of 6-9 years (Kashi *et al.*, 2009). Many reports have also recognized pyometra to be primarily a disease of middle aged and older bitches (Baithalu *et al.*, 2010; Dhaliwal *et al.*, 1999; Smith, 2006). The greater susceptibility of middle aged and older bitches to pyometra has been attributed to the repetitive exposure to the normal long luteal phase of the estrous cycle (Niskanen and Thrusfield, 1998). However, 39 per cent of bitches were affected with pyometra upto five years of age with no history of previous hormonal treatment suggesting that pyometra can occur even in younger bitches in absence of hormonal treatment. Similar to our finding susceptibility of pyometra cases affected bitches was high at 7-10 years of age (Singh *et al.*, 2020b).

Table 1: Influence of age, breed and parity of the bitches on the incidence of pyometra

Particulars		No. of bitches affected with pyometra (n=18)	Incidence (%)
Age	Upto 5 years	7	39
	Above 5 years	11	61
Breed	Non-descript	5	28
	Pomerarain	5	28
	German Shepherd	3	17
	Labrador	4	22
	Pug	1	5
Parity	Nulliparous	11	61
	Primiparous	5	28
	Pluriparaous	2	11

Breed wise Incidence

It was observed that highest incidence of pyometra occurred in bitches of Non-descript and Pomeranian (28%) followed by Labrador (22%), German Shepherd (17%) and Pug (5%) (Table1). Kashi *et al.* (2009) reported that majority of the pyometra cases in Spitz, followed by German Shepherd, Pomeranian, Cocker Spaniel, Doberman and Lhasa Apso. The point prevalence of pyometra cases in hospital was 28.9 and 22.2 per cent in Labrador and Spitz, respectively (Singh *et al.*, 2020b). It was also observed that smaller breeds were affected more than the large breeds of dogs. Breed strongly influences the risk of developing pyometra, which indicates that genetic factors may contribute to an increased or decreased susceptibility in certain breeds (Jitpean *et al.*, 2012; Niskanen and Thrusfield, 1998).

Parity wise Incidence

Nulliparous bitches were having highest incidence of pyometra (61%) cases followed by primiparous (28%) and pluriparous (11%) bitches (Table 1). Similar to our findings a prevalence of pyometra in the nulliparous bitch was about 64.4% in the hospital occurrence (Singh *et al.*, 2020b). The higher incidence of pyometra in nulliparous compared to primiparous and pluriparous bitches in the present study are in confirmation with the studies of Niskanen and Thrusfield (1998). Kashi *et al.* (2009) suggested that the incidence of pyometra was very high nulliparous bitches.

Antibiotic Sensitivity

Antibiotic sensitivity of vaginal swab samples is presented in Table 2. The highest numbers of vaginal samples were sensitive to Ceftriaxone (67%); whereas highest numbers of samples were resistant to Tetracycline (58%). The antibiogram also shows sensitivity to Ceftriaxone alone or in combination with Tazobactam (58%) and Enrofloxacin (58%) followed by Gentamicin (50%), Ofloxacin (33%) and least sensitivity to Amoxyclav (25%) and Tetracycline (25%). Hence, Ceftriaxone alone or in combination with Tazobactam can be an effective therapeutic choice for the treatment of pyometra in bitches. Deshpande (2005) reported sensitivity of Ceftriaxone to be 11.11 per cent.

Table 2: Antibiotic sensitivity of vaginal swab samples to different antibiotics in bitches affected with pyometra (n=12)

Antibiotic	No. of Sensitive samples*	No. of Intermediate samples*	No. of Resistant samples*
Amoxicillin/Clavulanic acid	3 (25%)	4 (33%)	5 (42%)
Ceftriaxone/ Tazobactam	7 (58%)	4 (33%)	1 (8%)
Ceftriaxone	8 (67%)	1 (8%)	3 (25%)
Enrofloxacin	7 (58%)	3 (25%)	2 (17%)
Gentamicin	6 (50%)	4 (33%)	2 (17%)
Ofloxacin	4 (33%)	3 (25%)	5 (42%)
Tetracycline	3 (25%)	2 (17%)	7 (58%)

*Figures in parenthesis indicate percent of positive samples

This finding differ from the present finding. Ros (2014) reported that 73 per cent of the cultured bacteria were sensitive to Amoxicillin/Clavulanic acid whereas Ghanbarpour and Akhtardanesh (2012) found Amoxicillin/Clavulanic acid to have a resistance of 3.57 per cent however findings of the present study showed Amoxicillin/Clavulanic acid to have a resistance of 42 per cent which is much higher than the findings of Ghanbarpour and Akhtardanesh (2012). Silva *et al.* (2004) during their etiological and therapeutic study on pyometra in female dogs found that Gentamicin was the most effective *in-vitro* antibiotic (97.83%) followed by Chloramphenicol (75.51%) and Streptomycin (65.79%), whereas Cephalosporin (14.81%) was the least effective drug. The time required for isolation and identification was greatly minimized and helpful in initiation of rapid treatment regimen (Bassessar *et al.*, 2013). However, it is further recommended that the isolation and identification should be carried out so as to confirm the etiological agent of pyometra in bitches.

Conclusion

From the present study, it may be concluded that incidence of pyometra is largely affected by age, breed and parity of the bitch. The vaginal samples of bitches affected with pyometra were found sensitive to Ceftriaxone alone or in combination with Tazobactam and Enrofloxacin followed by Gentamicin and Ofloxacin antibiotics.

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Conflict of Interests

There is no conflict of interest.

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