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Incidence of canine pyometra and cystic endometrial hyperplasia in Jabalpur (M.P) region

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Abstract

Pyometra, literally meaning pus in the uterus, is a common disease entity of intact bitches. The endometrium changes when impacted by bacterial infiltration, changes in endometrial steroid receptors can result in the clinical syndrome described as pyometra. The age, parity, breeds, administration of hormones are some predisposing factors of the condition. However, interaction between potentially pathogenic bacteria and hormonally primed uterus is believed to result in pyometra. The disease is initiated in the form of cystic endometrial hyperplasia, which later progresses into purulent uterine content following bacterial infection resulting in pyometra. This study was conducted on V.C.C., College of Veterinary Science and Animal Husbandry, Jabalpur from February, 2021 to September, 2021 of female dogs (age of six month or above). This paper will describe the risk factors, incidence by age, sex parity, season and severity.

Keywords: Pyometra, female dog, open and close cervix pyometra, incidence

1. Introduction

Pyometra is can be defined as a hormone induced uterine bacterial infection and inflammation, leading to pus-filled uterus affecting intact middle aged and older bitches (Egenvall *et al.*, 2001 and Smith, 2006) ^[8, 3]. It is also characterized by endometrial inflammation, accumulation of purulent exudate within the lumen, and bacterial infection (Santana and Santos, 2020) ^[1]. However, Cystic endometrial hyperplasia (CEH) is caused by repeated exposure of the endometrium to progesterone during the relatively long luteal phase of oestrus cycle in female dogs (Hardy and Osborne, 1974). The pathogenesis of pyometra in female dogs is complex, and it is affected by several factors including bacterial infection, neutrophilic activity, uterine motility, and concentration of immunoglobulins (Schlafer and Foster, 2016) ^[2]. As per the Santana and Santos (2020) ^[1] pathogenesis of pyometra is multifactorial and progesterone seems to be a key factor and Cystic endometrial hyperplasia has been described as a predisposing condition for canine pyometra. According to Rautela and Katiyar (2019) ^[10] age, parity, breeds, administration of hormones are some predisposing factors of the condition

Canine pyometra is commonly reported in mature bitches ranging from 4 to 16 year of age, but most commonly observed in age of 7.5 years with regular and repeated estrous cycle (Johnston *et al.*, 2001) ^[5]. Antonov *et al.* (2015) ^[9] reported the onset time of pyometra was most frequently 4 weeks after the last heat. Jitpean *et al.* (2014) ^[4] recently reported the occurrence of pyometra as 19 per cent in female dogs below 10 years of age and 20 per cent in older female dogs.

2. Materials and Methods

2.1 Location and Place of work

The proposed work was conducted in the Veterinary Clinical Complex (V.C.C.) and Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, NDVSU, Jabalpur, (M.P.) during the period of February to September, 2021.

2.2 Design of work and selection of animals

Incidence of canine pyometra and CEH was studied as number of cases of pyometra and CEH out of total gynaecological cases attended in V.C.C., College of Veterinary Science and Animal Husbandry, Jabalpur from February, 2021 to September, 2021 of female dogs.

The cases were graded as per the enclosed parameters consist of age, breed, parity, clinical finding and diagnosis into canine pyometra and CEH. Cases of pyometra also determined as mild, moderate and sever conditions. Classification of pyometra is as follow (Table 1 and Table 2)

Table 1: Classification of pyometra based on presence of vaginal discharge

Type of pyometra	Vaginal discharge
Open cervix	Discharge present which may be purulent, mucoid or hemorrhagic
Closed cervix	No discharge seen

Table 2: Classification of pyometra based on severity

Type of pyometra	Vaginal discharge
Mild	No cyst, normal endometrium surface, less anechoic uterine content
Moderate	Few and small syst, minute hyperplasia, anechoic uterine content
Severe	Large and many cysts and pus pocket in uterus with irregular surface, hypertrophy or atrophic endometrium, hyperechoic uterine content

All the female dogs exhibiting some or all of the typical signs of pyometra characterised by depression, anorexia, polydipsia, polyuria, pyrexia, vomition and purulent vaginal discharge. General clinical examination was carried out before the start of treatment to check general health status which includes rectal temperature, pulse rate, respiration rate and dehydration status. All the animals after recording history (breeding history etc.) and clinical examinations was further confirmed by trans-abdominal ultrasonography and graded as pyometra (open and closed canine pyometra) or cystic endometrial hyperplasia. Gynaecological examination

includes per vaginal examination, nature of vaginal discharge and abdominal palpation.

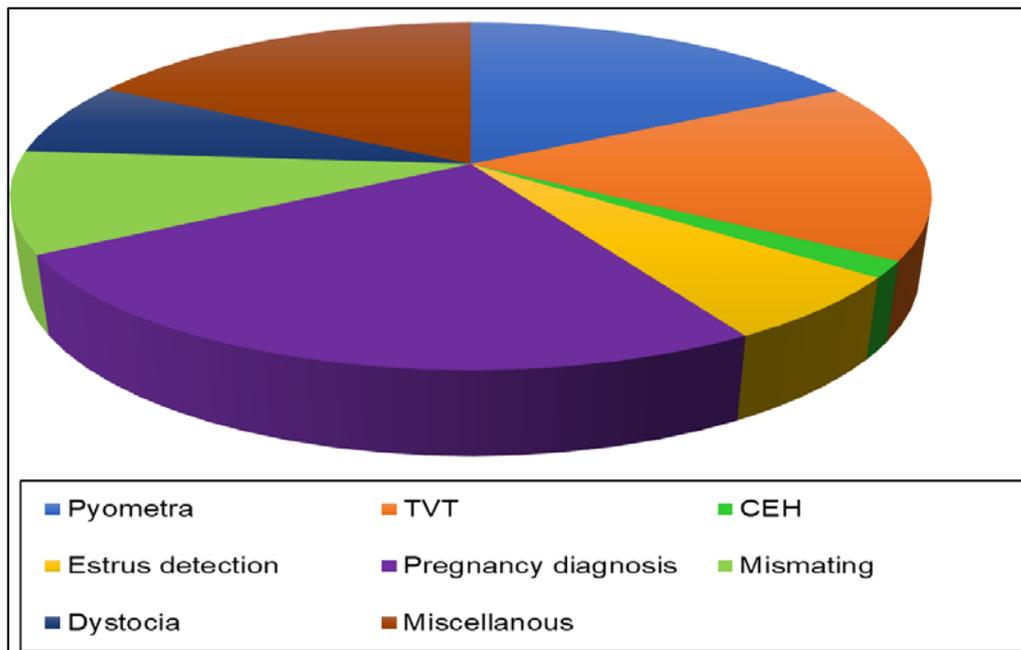
3. Results and Discussions

3.1. Incidence of canine pyometra out of total gynaecological cases in dogs attended at VCC during February to September, 2021

A total of 455 gynaecological cases in female dogs were registered at VCC during February to September, 2021 for various diseases / disorders are presented in Table 3. The incidence of canine pyometra and CEH recorded to be 17.14 (78/455) and 1.53 (07/455) per cent, respectively. Maximum 25.27 per cent (115/455) of cases were registered for pregnancy diagnosis. The incidence of miscellaneous cases 16.92 (77/455) per cent followed by Transmissible venereal Tumor (TVT) 16.60 (76/455), Mismating 9.45 (43/455), Dystocia and Whelping 6.81 (31/455) and Estrus detection 6.19 (28/455) per cent, respectively. The incidence of pyometra is reported to vary between 2.00 to 55.17 per cent (Hagman, 2000 and Ravishankar *et al.*, 2004).

Table 3: Incidence of canine pyometra and cystic endometrial hyperplasia (CEH) out of total gynaecological cases in dogs attended at V.C.C. during February to September, 2021

S. No.	Type of case	Incidences	
		(N = 455)	%
1	Pyometra	78	17.14
2	TVT	76	16.60
3	CEH	07	1.53
4	Estrus detection	28	6.19
5	Pregnancy diagnosis	115	25.27
6	Mismating	43	9.45
7	Dystocia and whelping	31	6.81
8	miscellaneous	77	16.92



3.2 Month wise incidence of canine pyometra out of total gynaecological cases recorded in female dogs attended at V.C.C. during February to September, 2021

The month wise incidence of canine pyometra was also studied (Table 4) and it is found that the incidence was found highest to be highest in the month of February (29.54%)

followed by March (19.48%) and April (16.66%), respectively. It was lowest in the September (3.92%) and August (8.69%). No cases were recorded in the month of May 2021 as the VCC was closed due to Covid-19 outbreak. Laurusevicus (2009) reported that the incidence of pyometra was highest in summer.

Table 4: Month wise incidence of canine pyometra out of total gynaecological cases recorded in female dogs attended at V.C.C. during February to September, 2021

S. No.	Month (2021)	Total cases (n)	Incidence of pyometra	
			n	%
1	February	115	34	29.54
2	March	77	15	19.48
3	April	30	05	16.66
4	May	-	-	-
5	June	52	07	13.46
6	July	61	09	14.75
7	August	69	06	8.69
8	September	51	02	3.92
	Total	455	78	17.14

3.3 Month wise incidence of canine pyometra out of total cases recorded in adult female dogs attended at V.C.C. during February to September, 2021

The detailed results of month wise incidence of canine pyometra out of total cases recorded in adult female dogs attended at V.C.C. are outlined in table 05. The incidence of canine pyometra was recorded to be 3.09 per cent out of total female dogs (n= 1974) registered in VCC during February to September 2021. The month wise incidence of canine pyometra was found to be highest in the month of February (7.96%), followed by March (3.92%), April (3.14%) and July (2.73%). The lowest incidence of canine pyometra was recorded in the month of August (1.91%).

Table 5: Month wise incidence of canine pyometra out of total cases recorded in adult female dogs attended at V.C.C. during February to September, 2021

S. No.	Month	Total cases (N)	Incidences of pyometra	
			n	%
1	February	427	34	7.96
2	March	306	15	3.92
3	April	127	05	3.14
4	May	-	-	-
5	June	277	07	2.88
6	July	256	09	2.73
7	August	365	06	1.91
8	September	216	02	2.78
	Total	1974	78	3.09

3.4 Breed wise distribution of incidence of canine pyometra at V.C.C. during February to September, 2021

The detailed breed wise incidence of canine pyometra at V.C.C. are depicted in table 06. The highest incidence of canine pyometra was recorded in Labrador 33.4 per cent followed by 26.90 per cent in Pomeranian, 10.25 per cent in Pug, 7.69 per cent in German Shepherd, 6.41 per cent in non-descript breed and 3.84 per cent in Lhasa Apso during the period of study. The incidence of canine pyometra was found to be very low in Dalmatian, Rottweiler, Doberman, Saint Bernard and Bull Mastiff breeds.

Singh (2017) in his study on hospital occurrence reported that the incidence of pyometra is highest in the Labrador (28.89%), followed by Spitz (33.33%), non-discript (20.00%) and German Shepherd (8.89%) while the incidence was relatively lower in the Doberman, Pug, Saint Bernard, Rottweiler and Dalmation breeds. Rautela and Katiyar (2019)^[10] and Singh *et al.* (2021) reported that breeds at high risk of developing canine pyometra include Labrador, Spitz, German Shephard and Dalmatian, However, Doberman, Dachshund, Great l Dane, Pug, Boxer, Lhasa Apso, Cocker Spaniel, Saint

Bernard and English Bulldog lower risk of pyometra in India. Hadiya *et al.* (2021) reported the greatest prevalence of pyometra in Pomeranian breed. However, no association between the incidence of pyometra and breed of animal has been observed by Martins *et al.* (2015).

Table 6: Breed wise distribution of incidence of canine pyometra at V.C.C. during February to September, 2021

Breed of dogs	Pyometra cases (n = 78)	Incidences (%)
Labrador	26	33.4
Pomeranian	21	26.9
pug	8	10.25
German Shepherd	6	7.69
Non-descript	5	6.41
Lhasa Apso	3	3.84
Saint Bernard	3	3.84
Bull Mastiff	2	2.56
Rottweiler	1	1.28
Dalmatian	2	2.56
Doberman	1	1.28

3.5 Parity wise distribution of incidence of canine pyometra at V.C.C. during February to September 2021

The detailed results of parity wise incidence of canine pyometra at V.C.C. are depicted in table 07 in which the incidence of canine pyometra was found to be higher in nulliparous (60.26%) as compared to parous (39.74%) dogs. Gupta *et al.* (2020)^[13] and Hadiya *et al.* (2021)^[7] also reported an increased incidences of pyometra in nulliparous female dogs. The higher incidence of pyometra in nulliparous females might be due to repetitive exposure of the uterus to the progesterone due to the longer luteal phase of the estrous cycle (Singh *et al.*, 2020)^[12].

Table 7: Parity wise distribution of incidence of canine pyometra at V.C.C during February to September, 2021

Parity	Animals affected with pyometra (n= 78)	Incidences of pyometra (%)
Nulliparous	47	60.26
Parous	31	39.74

3.6 Age wise distribution of incidences of canine pyometra at V.C.C during February to September, 2021

The incidences of canine pyometra were studied and presenting in table 08 where, age groups are categorized into three categories *i.e.*, upto 5 years, 5 to 10 years and above 10 years. The incidence of canine pyometra was found to be higher (39.75%) in animals of age 5 to 10 years (middle age group) followed by age above 10 years (35.89%) and age below 5 years (24.36%).

Pyometra in the present study was found to be a disease primarily affecting the middle aged to older female dogs and results are comparable to the finding of Jipten *et al.* (2012)^[4] and Gibson *et al.* (2013)^[11]. However, Hadiya *et al.* (2021)^[7] reported that the occurrence of pyometra was greater in 7-9 years age group followed by 10-12 years and in 4-6 years age group.

Table 8: Age wise distribution of incidence of canine pyometra at V.C.C during February to September 2021

Age group	Cases of pyometra (n=78)	Incidences (%)
< 5 years	19	24.36
5 – 10 years	31	39.75
> 10 years	28	35.89

3.7 Incidence of canine pyometra based on severity of cases

The detailed results of incidence of canine pyometra based on severity of cases are presented in table 09. The analysis of data revealed that the incidence was highest for moderate type canine pyometra (44.87%) followed by severe type (33.34%) and mild type (21.79%) canine pyometra.

Table 9: Severity wise distribution of incidences of canine pyometra at V.C.C during February to September, 2021

Type of pyometra	Cases (n = 78)	Incidences (%)
Mild	17	21.79
Moderate	35	44.87
Severe	26	33.34

3.8 Incidence of canine pyometra based on patency of cervix

The detailed results of incidence of canine pyometra based on patency of cervix are presented in table 10. The analysis of data revealed that the incidence was highest for open type canine pyometra (44.87%) followed by close type pyometra (33.34%).

Table 10: Severity wise distribution of incidences of canine pyometra at V.C.C during February to September, 2021

Type of pyometra	Cases (n = 78)	Incidences (%)
Open cervix pyometra	45	57.69
Close cervix pyometra	33	42.31

4. Conclusions

The present study was carried out to provide information of the incidence and probability of developing pyometra based on age, breed, parity and months and classified as mild, moderate, severe and open cervix, close cervix condition of pyometra. The incidence of canine pyometra was recorded 17.14 per cent and 3.09 per cent, respectively on O.P.D Gynaecology (n=455) and total V.C.C. (N=1974). Breed wise incidences of canine pyometra was recorded highest in Labrador and Pomeranian breeds 33.4 per cent and 26.9 per cent respectively followed by pug (10.25%), German Shepherd (7.69%), non-descript (6.41%) and Lhasa Apso (3.84%). Parity wise incidence reveals higher in nulliparous (60.26%) as compared to parous (39.74%) dogs. However, study also revealed more incidences in 5 to 10 years of age (39.75%). Incidence of canine pyometra based on severity and patency of cervix of cases studied where highest incidence of moderate cases (44.87%) with open cervix pyometra were recorded followed by severe type (33.34%) and mild type of pyometra (21.79%). These data may be useful for designing cat breeding programs in high-risk breeds and lays a foundation for further studies of the genetic background of the disease.

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