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An incidence of cystic endometrial hyperplasia - pyometra complex in female dogs

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Abstract
We studied incidence rate of pyometra at T.V.C.C., College of Veterinary Science and Animal Husbandry, Jabalpur for one year from June, 2017 to May, 2018 of female dogs (age of six month or above). The mean incidence rate (IR) for pyometra was about 48 dogs per 289 dogs years at risk (DYAR). Incidence rate (IR) of canine pyometra was recorded as 16.61% out of total gynaecological cases attended at T.V.C.C. during the period. The month wise IR was found highest in the month of February (28.12%), Breed wise IR was recorded highest in Labrador and Pomeranian breeds (29.17% each). Higher incidence of canine pyometra was recorded in nulliparous (58.33%) as compared to parous (41.67%) dogs. The higher incidence of canine pyometra (41.67%) was found in animals of 5 to 10 years (Middle aged group) and moderate type pyometra (41.67) was recorded followed by severe type (33.33%) and mild type (27.08%). The present study provides information of incidence and probability of developing pyometra based on age, month and breed. These data may be useful for designing dog breeding programs in high-risk breeds and for future studies.

Keywords: Incidence, Pyometra, Dog, Breed

1. Introduction
Canine pyometra or chronic purulent endometritis is a common reproductive disorder of diestrum in middle-aged to old bitches. It is characterized by uterine bacterial infection with pus accumulating in the uterus and systemic illness (Borresen, 1975) [2]. It is the most frequent disease of the reproductive tract in bitches and of great practical importance (Kempisty *et al*., 2013) [10]. It affects nearly one fourth of all female dogs before they reach ten years of age (Egenvall *et al.*, 2001) [4]. The clinical presentation of pyometra is similar in cats and dogs, with symptoms as vaginal discharge, anorexia, and lethargy most commonly described. Also the aetiology is perceived as similar with progesterone influence predisposing the uterus for uterine bacterial infection, which can be life-threatening.
As pyometra is a disease of luteal phase, the most bitches show clinical signs within two months after oestrus (Noakes *et al.*, 2009) [14]. Morrow (1980) [13] suggested that the severity of clinical symptoms is dependent upon cervical patency, stage of the oestrous cycle, the presence of bacterial infection in the uterus, the duration of illness and the severity of uterine and extra genital lesions. The most common clinical signs are depression, anorexia, vaginal discharge, vomition, polydipsia, polyuria, nocturia and diarrhoea. Signs less commonly observed are abdominal enlargement and vulvar swelling. The volume of vaginal discharge is highly variable and depends on the degree of cervical patency. The discharge is usually yellowish-grey or reddish brown and has a fetid odour. Rectal temperature is usually normal. Subnormal temperature is occasionally observed, usually in severely toxic animals. Likewise, (Borresen, 1975) [2] reported that 37 per cent cases of canine pyometra had elevated body temperature while 10 per cent had subnormal temperature. The present study provides information of incidence and probability of developing pyometra based on age (age of six month or above), breed, parity and months and classified as mild, moderate and severe condition of pyometra. These data may be useful for designing dog breeding programs in high-risk breeds and for future studies

2. Materials and Methods
2.1 Ethical approval
All of the procedures of this experiment were approved by the committee of ethics for research of College of Veterinary Science and Animal Husbandry, Jabalpur, India.

2.2 Study plan

The proposed work was conducted in the Teaching Veterinary Clinical Complex (T.V.C.C.) and Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, Jabalpur (M.P.) during the period of June, 2017 to May, 2018.

Incidence of canine pyometra was studied as number of cases of pyometra out of total gynaecological cases attended in T.V.C.C., College of Veterinary Science and Animal Husbandry, Jabalpur from June, 2017 to May, 2018 of female dogs (age of six month or above). The detail of pyometra was studied as per the enclosed parameters consist of age, breed, parity and months and classified as mild, moderate and severe condition of pyometra were also determined. The following parameters were used for classification of severity of pyometra (Table1).

Table 1: Classification of pyometra on the basis of severity

Type of pyometra	Conditions
Mild	No cysts, normal endometrium surface, less anechoic uterine content
Moderate	Few and small cysts, normal endometrial surface to less hyperplasia, anechoic uterine content
Severe	Many and large cysts in all the uterus, irregular surface and hypertrophic or atrophic endometrium, hyper echoic uterine content, more number of pus pockets

Data regarding the breed, age and parity were collected. The case history suggestive of pyometra included clinical signs such as anorexia, depression, presence of vaginal discharge, vomition, polyuria, polydipsia and diarrhoea were recorded. In addition to this, previous reproductive history if any was also obtained. 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. Gynaecological examination includes per vaginal examination, nature of vaginal discharge and abdominal palpation. Ultrasonography of uterus was done for confirmation of pyometra.

3. Result

Incidence of canine pyometra out of total gynaecological cases in dogs attended at T.V.C.C. during 2017-18

The various 289 gynaecological cases in dogs attended at T.V.C.C. during year 2017-2018 are presented in Table 3 where incidence of canine pyometra was recorded 16.61 per cent. The highest incidence of cases of pregnancy diagnosis was observed, followed the cases of pyometra.

Table 3: Incidence of canine pyometra out of total gynaecological cases in dogs attended in T.V.C.C during 2017-18

S. No.	Types of case	Incidence	
		(N=289)	%
1.	Pyometra	48	16.61
2.	TVT	45	15.57
3.	Estrus detection	20	6.92
4.	Pregnancy diagnosis	88	30.45
5.	Mismating	25	8.65
6.	Dystocia	18	6.23
7.	Miscellaneous	45	15.57

Month wise incidence of canine pyometra out of total case recorded in female dogs at TVCC during 2017-18

The incidence of canine pyometra was recorded 16.61% out of total gynaecological cases (n= 289) at TVCC during the period of June, 2017 to May, 2018 (Table 4). The month wise incidence was also studied and it is evident from Table 4 that the pyometra was recorded throughout the year however, the incidence was found highest in the month of February (28.12%) followed by March (23.81%) and April (21.05%). It was lowest in January (6.90%), September (4.54%) and June (8.33%).

Table 4: Month wise incidence of canine pyometra out of total gynaecological cases recorded in TVCC during 2017-18

S. No.	Month of year (2017-18)	Total cases (N)	Incidence of pyometra	
			N	%
1	June	12	1	8.33
2	July	37	6	16.22
3	August	32	5	15.62
4	September	22	1	4.54
5	October	21	3	14.29
6	November	28	5	17.86
7	December	23	5	21.74
8	January	29	2	6.90
9	February	32	9	28.12
10	March	21	5	23.81
11	April	19	4	21.05
12	May	13	2	15.38
	Total	289	48	16.61

Month wise incidence of canine pyometra out of total cases recorded in adult female dogs at T.V.C.C. during 2017-18

The incidence of canine pyometra was recorded 1.84 % out of total female dogs (n=2612) registered in TVCC during June, 2017 to May, 2018 (Table 5). The month wise incidence was also studied and it is evident from table that the pyometra was recorded throughout the year however, highest incidence was found in the month of February (4.69%) followed by July (3.0 %), November (2.51 %), August (2.22 %), March (2.33%) and April (21.05%). It was recorded very low (less than 1.0 %) in the months of January May, June and September.

Table 5: Month wise incidence of canine pyometra out of total cases recorded in adult female dogs at T.V.C.C. during 2017-18

S. No.	Month of year (2017-18)	Total cases (N)	Incidence of pyometra	
			N	%
1	June	234	1	0.427
2	July	200	6	3
3	August	225	5	2.22
4	September	202	1	0.495
5	October	262	3	1.14
6	November	199	5	2.51
7	December	263	5	1.90
8	January	213	2	0.94
9	February	192	9	4.69
10	March	215	5	2.33
11	April	190	4	2.10
12	May	217	2	0.92
	Total	2,612	48	1.84

Breed wise distribution of incidence of canine pyometra at T.V.C.C. during 2017-18

Incidence of pyometra in relation to breed of dog is presented in Table 6. The highest incidence of canine pyometra was

recorded in Labrador and Pomeranian breeds (29.17% each) followed by Non-descript (14.58%), Pug (8.33%), German Shepherd (6.25%) and Lhasa Apso (4.17%) during the period of study. Breed like Dalmatian, Rottweiler, Doberman and Bull Mastiff had very low (2.08%) incidence of canine pyometra in this study.

Table 6: Breed wise distribution of incidence of canine pyometra at TVCC during 2017-18

Breed of dog	Pyometra cases (n=48))	Incidence (%)
Labrador	14	29.17
Pomeranian	14	29.17
Non-descript (N.D.)	7	14.58
Pug	4	8.33
German Shepherd	3	6.25
Lhasa Apso	2	4.17
Dalmatian	1	2.08
Rottweiler	1	2.08
Doberman	1	2.08
Bull Mastiff	1	2.08

Parity wise distribution of incidence of canine pyometra at TVCC during 2017-18

The incidence of canine pyometra was also studied parity wise and data are presented in table 7. Table 7 shows higher incidence of canine pyometra in nulliparous (58.33%) as compared to parous (41.67%) dogs.

Table 7: Parity wise distribution of Incidence of canine pyometra at TVCC during 2017-18

Parity	Animals affected with pyometra (n=48)	Incidence of pyometra (%)
Nulliparous	28	58.33
Parous	20	41.67

Age wise distribution of incidence of canine pyometra at TVCC during 2017-18

The incidence of canine pyometra was also studied in 3 age groups i.e. upto 5 years, 5-10 years and above 10 years and data are presented in table 8. The data from table showing that the higher incidence of canine pyometra (41.67%) was found in animals of 5 to 10 years (middle aged group), followed by below the age of 5 years (31.25%) and above the age of 10 years i.e. old aged group (27.08%).

Table 8: Age wise distribution of incidence of canine pyometra at TVCC during 2017-18

Age group	Cases of pyometra (n=48)	Incidence (%)
< 5 years	15	31.25
5-10 years	20	41.67
≥ 10 years	13	27.08

Incidence of canine pyometra based on severity of cases

The results of incidence of canine pyometra based on severity of cases are presents in Table 9. The analysis of data reveals that highest incidence of moderate type pyometra (41.67) was recorded followed by severe type (33.33%) and mild type (27.08%).

Table 9: Severity wise distribution of incidence of canine pyometra at TVCC during 2017-18

Type of pyometra	Cases (n=48)	Incidence (%)
Mild	13	27.08
Moderate	19	39.58
Severe	16	33.33

4. Discussion

Incidence of canine pyometra out of total gynaecological cases in dogs attended at T.V.C.C. during 2017-18

Incidence of canine pyometra was recorded as 16.61% out of total gynaecological cases attended at T.V.C.C. during the period from June, 2017 to May, 2018. Almost similar incidence of canine pyometra (15.2%) was also recorded by (Fakuda, 2001) [6]. Whereas low incidence of pyometra ranging from 0.7 to 11.23% has been reported (Renukaradhya, 2011) [16].It may be due to the less number of total gynaecological cases registered at T.V.C.C. during the period of study where correct diagnosis was made by ultrasonography using latest version of colour Doppler U.S.G. machine. The lower incidence of canine pyometra (1.84 %) in this study may not be justified for comparison as it was calculated out of total cases registered in adult female dogs at T.V.C.C. during the study period.

Month wise incidence of canine pyometra out of total case recorded in female dogs at T.V.C.C. during 2017-18

The month wise incidence was also studied where pyometra was recorded throughout the year however, the incidence was found highest in the month of February (28.12%) followed by March (23.81%) and April (21.05%). It was lowest in January (6.90%), September (4.54%) and June (8.33%). The literature regarding month wise incidence of canine pyometra is scant however, in the study of (Antonov *et al*., 2015) [1] in Bulgaria the seasonal patterns of pyometra was showed where disease occurred most frequently in the month of autumn and spring *i.e.,* September in (11.98%), May (11.52%) and October (10.6%). The lowest numbers of cases were observed in the winter. However, (Laurusevicius, 2009) [11] reported highest incidence in summer. The variation in incidence may be due to the local geographical factors and influence of seasonality in canine breeding as post breeding uterine affection is common in non-conceiving animals.

Breed wise distribution of incidence of canine pyometra at T.V.C.C. during 2017-18

The highest incidence of canine pyometra was recorded in Labrador and Pomeranian breeds (29.17% each) followed by Non-descript (14.58%), Pug (8.33%), German shepherd (6.25%) and Lhasa Apso (4.17%) during the period of study. Breed like Dalmatian, Rottweiler, Doberman and Bull Mastiff had very low (2.08%) incidence of canine pyometra. Predisposition to pyometra in certain breeds had been rarely reported in the literature. Ewald (1961) [5] recorded a relatively high breed specific prevalence in Collie and Belgium Shepherd dog and low prevalence in Dachshund and Poodle, but no formal statistical procedures were applied to the data. An increased incidence in breeds such as Golden Retriever, Irish Terrier, Saint Bernard, Rottweiler Dogs was reported by (Jitpean *et al*., 2014; Antonov *et al*., 2015) [8, 1]. However, no association between the incidence of pyometra and breed of the animal has been observed by (Martins *et al.*, 2015) [12].

(Egenvall *et al*., 2001) [4] opined that the occurrence of pyometra differed with age, breed, and geographic location. The risk of developing pyometra was increased (identified using multivariate models) in rough Collies, Rottweiler, Cavalier King Charles Spaniels, Golden Retrievers, Bernese Mountain Dogs, and English Cocker Spaniels compared with baseline (all other breeds, including mixed breed dogs). Breeds with a low risk of developing the disease were

Drevers, German Shepherd, Miniature Dachshunds, Dachshunds (normal size) and Swedish Hounds.

Based on the above information it could be considered that the difference in the present incidence of pyometra in different breeds could be consequent to popularity of a particular breed in different geographical location rather than any breed predisposition. This presumption appears to be well substantiated by (Martins *et al.,* 2015) [12] who also opined that the incidence of pyometra had no bearing on the breed.

Parity wise distribution of incidence of canine pyometra at T.V.C.C. during 2017-18

The incidence of canine pyometra was also studied parity wise where higher incidence of canine pyometra was recorded in nulliparous (58.33%) as compared to parous (41.67%) dogs. Similar to the results of present study an increased incidence of pyometra was also reported in nulliparous bitches by several authors (Sharma, 2004; Pretzer, 2008) [17, 15]. It may be due to the endocrine disturbances especially exposure of progesterone and estrogen in maiden bitches and its effect on endometrium. The ascending infection may predispose the conditions especially in non-hygienic management of female dogs during oestrus. Gestation also exerts a protective action on endometrium for uterine affections in pregnant bitches, which lacks in none conceive animals.

Age wise distribution of incidence of canine pyometra at T.V.C.C. during 2017-18

The incidence of canine pyometra was also studied here in three age groups *i.e.* upto 5 years, 5-10 years and above 10 years. The higher incidence of canine pyometra (41.67%) was found in animals of 5 to 10 years (middle aged group), followed by below the age of 5 years (31.25%) and above the age of 10 years *i.e.* old aged group (27.08%).There is ample literature where reported ages for bitches diagnosed with pyometra range from as young as 4 months to as old as 16 years of age.

Pyometra in the present study was found to be a disease primarily affecting the middle aged to older bitches and results are comparable to the findings of (Johnston *et al.,* 2001) [9]. 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.

However, pyometra was also observed, although less frequently (7.006%) in animals aged less than two years (Renukaradhya, 2011) [16]. (Wheaton *et al.,* 1989) [18] suggested that the hormonal therapies such as progestins for estrus suppression or estrogens for estrus induction or to prevent pregnancy may have a correlation in the development of disease in young animals. (Bowen *et al.,* 1985) [3] concluded that estrogen is an important factor for the development of pyometra in young animals and that it is probably due to the progesterone priming effects of estrogen. However, in the present study 31.25% of animals in which pyometra was diagnosed were aged under five years with no medical history of previous hormonal treatment suggesting that pyometra can occur even in younger animals in spite of absence of hormonal treatment. It is probable that pyometra in younger animals may be associated with an abnormal response of the uterus to a prolonged progesterone phase rather than repetitive exposures experienced as the bitch gets older. (Egenvall *et al.,* 2001; Hagman, 2004) [4, 7] also reported pyometra in 25 % of bitches by 10 years of age which supports the results of present study in older bitches.

Severity wise distribution of incidence of canine pyometra at T.V.C.C. during 2017-18

The result of present study revealed that highest incidence of moderate type pyometra (41.67) was recorded followed by severe type (33.33%) and mild type (27.08%). It may be due to referral cases in T.V.C.C. from the private clinics which survive however, the most of the severe cases may die undiagnosed before reaching to the veterinary hospital. The literature regarding such study of canine pyometra is not traceable thus, unable to compare the results.

5. Conclusion

The present study provides information of the incidence and probability of developing pyometra based on age, breed, parity and months and classified as mild, moderate and severe condition of pyometra. The mean incidence rate (IR) for pyometra was about 48 dogs per 289 dogs years at risk (DYAR) with a significant breed and month effect observed. Incidence of canine pyometra was recorded 16.61 % in out of total gynaecological cases attended in T.V.C.C. during the year 2017-2018. Higher incidence of pyometra was recorded in Labrador and Pomeranian breeds of dog, in 5-10 years of age and in nulliparous dogs. The median age at diagnosis was 4 years, and the disease was more commonly diagnosed with increasing age. The mean case fatality rate in all bitches was 5.7%. 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.

6. Disclosure statement

No potential conflict of interest was reported by the authors.

7. References

1. Antonov AL, Atanasov AS, Fasulkov IR. Influence of some factors on the incidence of pyometra in the bitch. Bulg J Vet Med. 2015; 18(4):367-372.
2. Borresen B. Pyometra in the dog: A pathophysiological investigation. The pyometra syndrome, a review. Nord Vet Med. 1975; 27:508-517.
3. Bowen RA, Olson PN, Behrendt MD, Wheeler SL, Husted PW, Nett TM. Efficacy and toxicity of estrogens commonly used to terminate canine pregnancy. J Am Vet Med Assoc. 1985; 186:783-788.
4. Egenvall A, Hagman R, Bonnett BN, Hedhammar A, Olsson P, Lagerstedt AS. Breed risk of pyometra in insured dogs in Sweden. J Vet Intern Med. 2001; 15:530-538.
5. Ewald BH. A survey of the cystic hyperplasia - pyometra complex in the bitch. Vet Med Sm Anim Clin. 1961; 1:383-386.
6. Fakuda S. Incidence of pyometra in coloy-raised beagle dogs. J Exp Anim Sci. 2001; 50:325-328.
7. Hagman R. New Aspects of Canine Pyometra. Studies on epidemiology and pathogenesis. Ph. D thesis. The Swedish University of Agricultural Sciences, Uppsala, Sweden, 2004. ISBN 91-576-6682-2.
8. Jitpean S, Holst BS, Emanuelson HOV, Pettersson A, Bull CA, Hagman R. Outcome of pyometra in female dogs and prediction of peritonitis and postoperative hospitalization in surgically treated cases. BMC Vet Res. 2014; 10:6.
9. Johnston SD, Root KMV, Olson PNS. Canine and Feline

Theriogenology, W.B. Saunders Company, Philedelphia, 2001, 168-224.
10. Kempisty B, Bucowska D, Wozna M, Piotrowska H, Jacowska M, Zuraw A *et al*. Endometritis and pyometra in bitches: A review. Vet Med-Czech. 2013; 58:289-297.
11. Laurusevicius S. Reproductive parameters of bitches and examination of vaginal micro flora during different stages of reproductive cycle. Summary of doctoral bitch. Vet Med Sm Anim Clin. 2009; 1:383-386.
12. Martins DG, Apparicio M, Vincente WRR. A survey of three year consultation: 119 cases of pyometra prognosis and outcome. J Anim Sci. 2015; 5(2):1202-1207.
13. Morrow DA. Current Theraphy in Theriogenology: diagnosis, treatment and prevention of reproductive diseases in animal, W. B. Saunders company, Philadelphia, 1980, 624-630.
14. Noakes DE, Parkinson TJ, England GCW. Arthur's Veterinary Reproduction and Obstetrics. 9th Edn., Saunders Elsevier, Edinburgh, 2009, 658p.
15. Pretzer SD. Clinical presentation of canine pyometra and mucometra: A review. Theriogenology. 2008; 70:359-363.
16. Renukaradhya GJ. Studies on treatment of pyometra in bitches with antiprogestins. Doctor of Philosophy thesis (Veterinary Gynaecology and Obstetrics), Karnataka Veterinary, Animal and Fisheries Science University, Bidar, 2011.
17. Sharma S. A comparative study on the diagnosis and treatment of canine pyometra with special reference to ultrasonography. M.V. Sc. & A. H. thesis (Animal Reproduction, Gynaecology and Obstetrics), Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, 2004.
18. Wheaton G, Johnson L, Parker J, Kneller K. Results and complications of surgical treatment of pyometra- A review of 80 cases. J Am Ani Hosp Associ. 1989; 25:563-568.