

PREVALENCE, CLINICAL AND HEMATO-BIOCHEMICAL EVALUATION OF CANINE PYOMETRA

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ABSTRACT

Canine pyometra is a common reproductive disorder of female dogs associated with a multi-systemic illness and requires early diagnosis and medical or surgical intervention. The present study aimed to determine the prevalence of pyometra during the period from March 2025 to 2026 and the incidence associated with age, breed, parity, stage of estrus and type of pyometra was recorded and analyzed. During the study period, a total of 211 female dogs were presented to the Gynecological ward, of which 44 were diagnosed with pyometra, yielding a prevalence of 20%. Occurrence of pyometra was higher in the age group 7-9 years, Indian spitz breed, nulliparous and in the diestrus stage. Open pyometra was more common than that of closed pyometra. Of 44 pyometra affected cases, 15 dogs were subjected to detailed clinical, haematological and biochemical evaluation and a statistically significant difference was found when compared to healthier dogs. Vaginal discharges were the predominant clinical sign, while Leukocytosis with marked neutrophilia was a classical feature of pyometra. This study provided insight into the occurrence, clinical and diagnostics characteristics of the canine pyometra.

Keywords: Canines, pyometra, prevalence, clinical signs, hematobiochemical

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INTRODUCTION

Canine pyometra is characterized by the accumulation of inflammatory exudate within the uterus (Kumar *et al.* 2019). The etiopathogenesis of the pyometra remains unknown and is considered to be multifactorial. The progesterone dominance

along with low estrogen levels during diestrus, stimulates the endometrial gland proliferation and glandular secretions which along with reduced myometrial contractions, uterine perfusion, immune response and closure of the cervix resulted in fluid accumulation and uterine distension. Further, secondary bacterial invasion and colonization culminate in bacteremia, endotoxemia and systemic inflammatory response syndrome characterized by a wide range of clinical signs (Hagman 2018, Santana and Santos 2021 and Imane *et al.* 2025). The current study aimed at examining the various

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predisposing factors (age, breed and parity), clinical and haemato-biochemical alterations in pyometra-affected dogs that were useful for the early detection and assessment of the severity of the condition, thereby facilitating the management of pyometra.

MATERIALS AND METHODS

The female dogs presented to the Teaching Veterinary Clinical Complex, College of Veterinary Science, Tirupati over a period of one year from March 2025- 2026 were examined for pyometra based on the anamnesis, clinical, hematobiochemical, radiographic and ultrasonographic findings. However, only 15 pyometra affected dogs underwent detailed examination and additionally, routine hematological and biochemical analysis was performed on fifteen dogs in control group.

The data obtained were tabulated and statistically analyzed using SPSS (Statistical Product and Service Solutions) 20.0 version as per the methods described by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

A total of 211 female dogs were presented for gynaecological conditions of which 44 cases were diagnosed as pyometra with an overall incidence of 20.85%. The incidence rate of pyometra in the present study was in accordance with Arendt *et al.* (2021) and greater incidence rate was observed by Gupta *et al.* (2020) and Verma *et al.* (2022).

AGE

In the present study, maximum incidence was observed in animals of the age 7-9 years (34.09%), followed by 10 to 12 years (27.27%), 4 to 6 years (22.73%), 13 to 15 years (11.36%) and least in the 0-3 age group (4.55%) with the mean age was 8.312 ± 0.50 respectively (Table. 1 and Fig. 1). Similar results were observed by Gibson *et al.* (2013) and Hadiya *et al.* (2021). Repeated estrous cycles characterized by prolonged progesterone dominance might predispose animals older than 7 years to pyometra.

BREED

The incidence of pyometra in various breeds was studied and the highest was observed in Indian spitz (36.36%) followed by Labrador (27.27%), Pug (9.15%), Lhasa Apso (6.82%), German Shepherd (6.82%), Rottweiler (4.55%) while, lowest incidence of 2.27% was reported in Shih Tzu, Golden Retriever, St. Bernard and Indian Mongrel in each (Table. 2 and Fig. 2). These findings were in accordance with Anusha (2021) and Achary *et al.* (2022). The highest incidence could be attributed to the comparatively larger population of these breeds locally.

PARITY

In the present study, the occurrence of pyometra was highest in nulliparous animals (52.27%) followed by primiparous (25%) and pluriparous (22.73%) (Table. 3 and Fig. 3). These results were consistent with Antonov *et al.* (2015) and Sethi *et al.* (2020). The endometrial clearance during

parturition and subsequent regeneration of the uterine lining with varied susceptibility to the estrogen and progesterone receptors could bring about a protective effect in pluriparous animals. (Fieni *et al.* 2014 and Anusha 2021)

TYPE OF PYOMETRA

The open type pyometra (87.09%) had a relatively higher incidence rate compared to the closed pyometra (15.91%) similar to the findings of Vidya *et al.* (2020) and Verma *et al.* (2022) (Table.4 and Fig. 4).

CLINICAL, HEMATOLOGICAL AND BIOCHEMICAL EVALUATION

Out of 44 dogs cases of pyometra, fifteen pyometra dogs were subjected to detailed clinical, hematological and biochemical evaluation.

Clinical Signs

The animals affected with pyometra exhibited a wide variety of systemic signs, the most common was vaginal discharges (100%) followed by inappetence/anorexia (80%), Abdominal distension (60%) and depression (53.33%) while polydipsia (13.33%) was the least common sign observed (Table.5).

Haematological findings

In the present study, the pyometra-affected dogs showed significantly lower mean Hb, TEC, PCV and percentage of lymphocytes levels. The mean TLC and

neutrophils percentages were significantly higher when compared than those of the control animals. (Table 6)

The lower Hb, TEC and PCV values could be attributed to the toxic inhibition of the bone marrow resulting in reduced erythropoiesis, diapedesis of erythrocytes into the uterine lumen along with their reduced life span. Marked Leukocytosis with neutrophilia with regenerative left shift and lymphopenia was considered as a consistent reliable clinical finding in severely affected dogs (Gupta and Dhama 2013, Samantha *et al.* 2018 and Anusha *et al.* 2023). The leukocytosis indicated the onset of an inflammatory reaction due to the purulent exudate within the uterus and to overcome the bacteremia. The neutrophilia could be due to the chemotactic effect, which stimulates granulopoiesis (Unnikrishnan *et al.* 2020).

Biochemical findings

The mean $\pm$ SE of creatinine, BUN and Total protein values were higher in pyometra affected dogs compared to the apparently healthy control animals (Table 6). The estimation of creatinine and BUN could be useful in assessing the renal damage in pyometra dogs. The renal dysfunction in pyometra could be correlated to the severity of the disease. (Anusha *et al.* 2023) which further aids in predicting the prognosis of the condition.

CONCLUSION

Knowledge about the clinical manifestations along with alterations in the hemato-biochemical parameters is useful in understanding the severity of the condition,

thereby predicting the prognosis of the disorder. In the present study, the prevalence of pyometra and associated potential risk factors were described, which also form the basis for the diagnosis of pyometra in canines.

Table.1. Age wise incidence of pyometra in canines (n=44)

S.No	Age	Number of animals affected	Percentage (%)
1	1 to 3 years	11	4.55
2	4 to 6 years	12	22.73
3	7 to 9 years	13	34.09
4	10 to 12 years	7	27.27
5	13 to 15 years	1	11.36
	Total	44	100.00

Table.2. Breed-wise distribution of pyometra (n=44)

S.No	Breed	Number of animals affected	Percentage (%)
1	Indian Spitz	16	36.36
2	Labrador	12	27.27
3	Pug	4	9.1
4	German Sheperd	3	6.82
5	LhasoApso	3	6.82
6	Rottweiler	2	4.55
7	Shih Tzu	1	2.27
8	Golden Retriever	1	2.27
9	St. Bernaud	1	2.27
10	Indian Mongrel	1	2.27
	Total	44	100.00

Table.3. Parity wise incidence of pyometra (n=44)

S.No	Parity	Number of animals	Percentage(%)
1	Nulliparous	23	52.27
2	Primiparous	11	25
3	Pluriparous	10	22.73
	Total	44	100.00

Table.4. Incidence of different types of pyometra (n=44)

S.No	Type of pyometra	Number of animals	Percentage(%)
1	Open	37	84.09
2	Closed	7	15.91
	Total	44	100.00

Table.5. Various clinical signs exhibited by pyometra affected dogs

S.No	Clinical sign	No. of animals	Percentage
1	Vaginal discharges	15	100
2	Inappetence	12	80
3	Abdominal distension	9	60
4	Vomiting	9	60
5	Depression	6	53.33
6	Pyrexia	5	33.33
7	Polyuria	3	20
8	Polydipsia	2	13.33

Table.6. Hematological and biochemical parameters of the control and pyometra affected dogs

S.No	Parameter	Control (n=15)	Pyometra (n=15)
1.	Hemoglobin	12.16 ± 0.48 ^a	9.21 ± 0.67 ^b
2.	Total Erythrocyte count	5.5 ± 0.22 ^a	4.19 ± 0.42 ^b
3.	PCV	35.29 ± 1.26 ^a	26.88 ± 2.22 ^b
4.	Total Leukocyte count	9.34 ± 0.57 ^a	27.02 ± 2.82 ^b
5.	Neutrophils	69.2 ± 1.68 ^a	80.27 ± 0.9 ^b
6.	Eosinophils	3.93 ± 0.77 ^a	1.74 ± 0.53 ^b
7.	Lymphocytes	23.4 ± 1.7 ^a	13.21 ± 0.55 ^b
8.	Monocytes	2.47 ± 0.54 ^a	4.03 ± 0.5 ^b
9.	Creatinine	1.14 ± 0.08 ^a	1.84 ± 0.22 ^b
10.	BUN	16.11 ± 2.41 ^a	35.99 ± 4.65 ^b
11.	Total Protein	6.81 ± 0.36 ^a	7.27 ± 0.47 ^a

Mean±SE bearing different superscripts varies significantly with $p < 0.05$

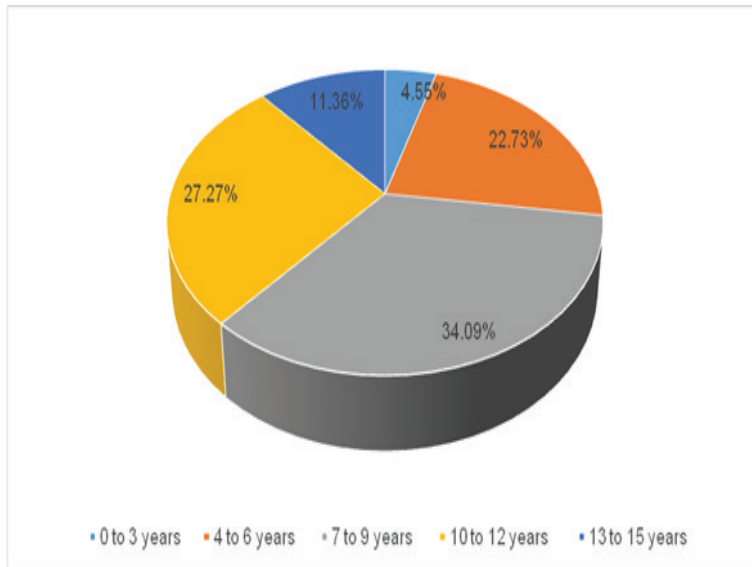


Fig.1. Age wise incidence of pyometra

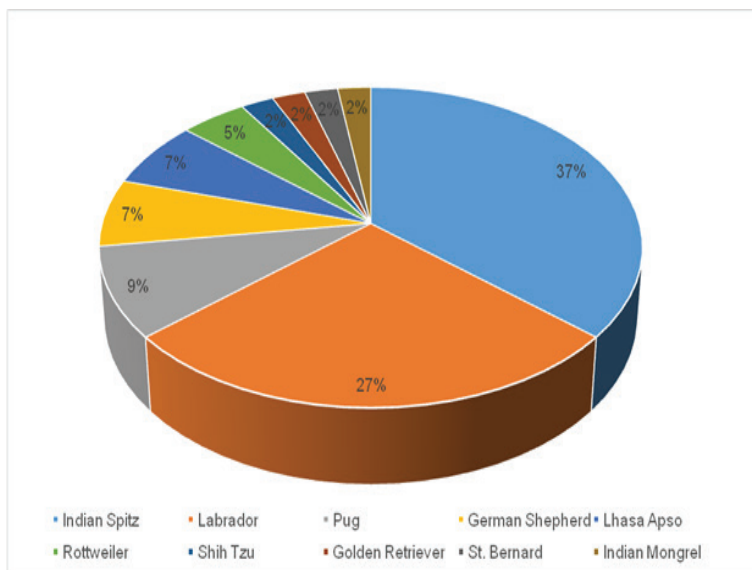


Fig.2. Breed wise distribution of pyometra

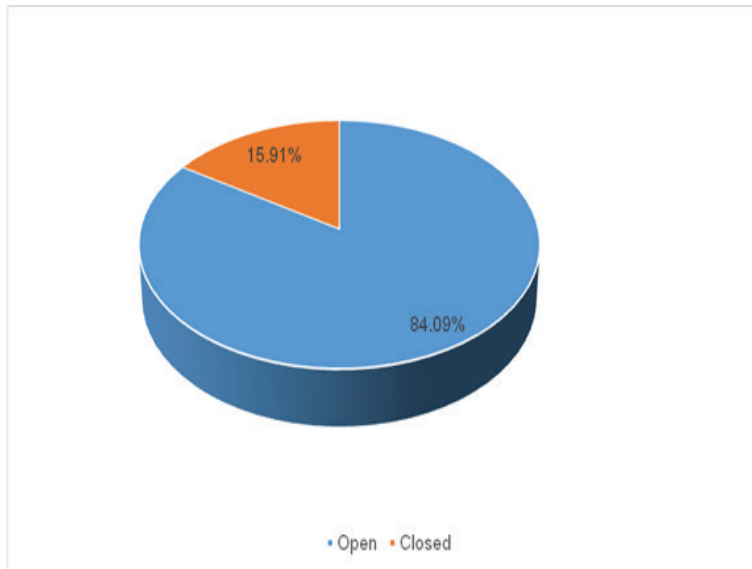


Fig. 3. Parity wise occurrence of pyometra

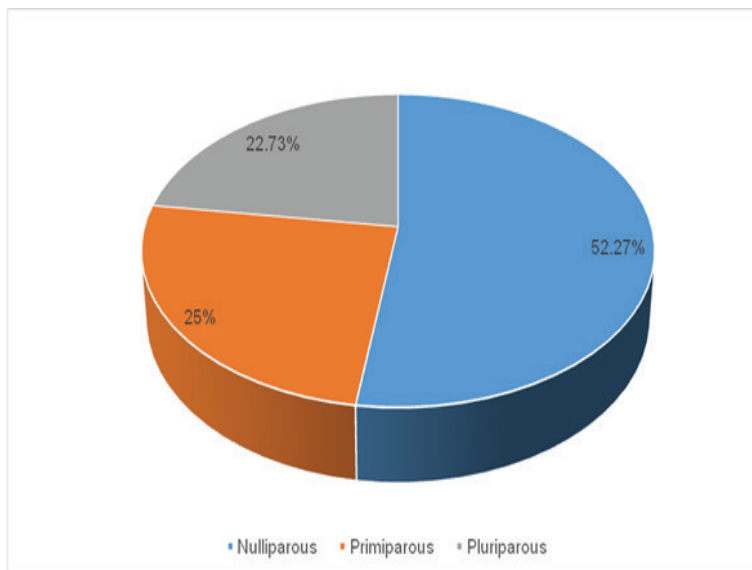


Fig. 4. Occurrence of different types of pyometra

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