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Incidence of cystic endometrial hyperplasia-pyometra complex in canines

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Abstract
The investigation was undertaken on 716 bitches brought to the Department of Veterinary Gynaecology and Obstetrics, NTRCVSc, Gannavaram for various ailments to study incidence of canine pyometra and influence of some factors on the incidence of pyometra.

Keywords: Pyometra, canines, incidence

Introduction
Pyometra is characterised by uterine bacterial infection with accumulation of pus in the uterus and systemic illness (Borresen, 1975) [4]. It is the most frequent disease of the reproductive tract in bitches and of great practical importance (Kempisty *et al*., 2013) [14]. It is commonly noticed in the middle aged to older bitches, however, can also occur in bitches as young as 4 months to as old as 16 years of age. Usually pyometra occurs during the luteal phase following estrus (Blendinger *et al*., 1997) [3], although anestrus bitches also be diagnosed with pyometra (approximately one third of the total cases) (Noakes *et al*., 2001) [18]. Despite modern treatment routines, the mortality rate due to pyometra is still approximately 3– 4 per cent (Egenvall *et al.*, 2001) [6]. The aim of the present study was to determine the incidence of canine pyometra in among various gynaecological ailments and influence of age, breed and parity on the incidence of pyometra in bitches.

Materials and Methods
The investigation included 716 bitches brought to the Department of Veterinary Gynaecology and Obstetrics, NTRCVSc, Gannavaram for various ailments during the period from November 2018 to February 2020. Diagnosis of pyometra was made based on case history, physical examination, laboratory analysis and diagnostic imaging *viz.*, radiography and ultrasonography. The data generated from the present study was pooled and analyzed to finalize the results as presented hereunder.

Results and Discussion
Incidence
Out of 716 bitches presented to the department, 122 bitches were diagnosed with pyometra with an overall occurrence of 17.04 per cent. Apart from pyometra, bitches were also presented for other gynaecological conditions *viz.*, pregnancy diagnosis (29.75%), breeding advice (13.7%), mismating (8.1%), dystocia (4.6%) and others (26.81%) (Table 1). The result was in accordance with the reports of Igna *et al*. (2009) [11] and Kumar *et al*. (2019) [15]. A slightly higher incidence of 27.27 per cent was reported by Deka (2003) [5] and 20 per cent by Jitpean *et al*. (2012) [12] whereas a lower incidence of 4.4 per cent was reported by Norelli *et al*. (2019) [19].
The age wise, breed wise, parity wise and type wise occurrence of pyometra was presented below.

Age
The mean age of incidence of pyometra was 8.03±0.26 years with the range of 2 to 15 years. The occurrence was highest in the age group of 6 to 9 years (29.51%), followed by 3 to 6 years (28.69%), 9 to12 years (27.05%), 12 to 15 years (9.83%) and least in bitches upto 3years of age (4.92%) (Table 2). Similarly, Martins *et al*. (2015) [16] and Bhat *et al*. (2018) [2] reported highest incidence in 6 to 9 years age group. Pyometra occurs most frequently in middle age to

older bitches (Jitpean *et al*. 2012 and Kumar *et al*. 2019) [12,15] but it can also occur in young dogs (Feldman and Nelson 2004) [8]. In the older bitch repeated exposure to progesterone during the luteal phase of estrus cycle predisposed to CEH and exaggerates the risk of developing pyometra as opined by Niskanen and Thrusfield (1998) [17]. It is unlikely that similar pathophysiologic process account for uterine disease in young and old dogs. However, a strong correlation exists between the incidence of pyometra in young dogs and estrogen administration (Feldman and Nelson 2004 and Whitehead 2008) [8,22].

Table 1: Incidence of various gynaecological conditions during the study period (n=716)

S. No	Type of condition	Incidence	
		(n=716)	%
1	Pregnancy Diagnosis	213	29.75
2	Pyometra	122	17.04
3	Breeding advice	98	13.7
4	Mismating	58	8.1
5	Dystocia	33	4.6
6	Others	192	26.81
Total		716	100

Table 2: Age wise incidence of pyometra

S. No	Parameter	Number of animals affected	Percentage
1	Upto 3	6	4.92
2	3 to 6	35	28.69
3	6 to 9	36	29.51
4	9 to12	33	27.05
6	12 to 15	12	9.83
Total		122	100

Breed

In the present study, the breed wise distribution of pyometra was found to be highest in Spitz (43.44%) followed by Labrador (22.95%), Mongrel (9.83%), German Shepard (7.38%), Pug (5.74%), Pomeranian (4.10%), Great Dane (2.46%), Doberman (1.64%), Dachshund, Bull Mastiff and Saint Bernard (0.82% each) (Table 3). The results were in accordance with Simon *et al*. (2011) [20] who reported highest incidence of pyometra in Spitz (39.56%) followed by Labrador (12.94%). Though, several authors reported differences in the susceptibility of different breeds to pyometra (Antonov *et al*. 2015 and Bhat *et al*. 2018) [1,2], it can occur in any breed (Feldman and Nelson 2004) [8]. The higher incidence in Spitz and Labrador in the present study might be attributed to popularity of the breed locally as opined by Faldyna *et al*. (2001) [7].

Table 3: Breed wise occurrence of pyometra

S. No	Parameter	Number of animals affected	Percentage
1	Spitz	53	43.44
2	Labrador	28	22.95
3	Mongrel	12	9.83
4	German Shepard	9	7.38
5	Pug	7	5.74
6	Pomeranian	5	4.10
7	Great Dane	3	2.46
8	Doberman	2	1.64
9	Dachshund	1	0.82
10	Bull Mastiff	1	0.82
11	Saint Bernard	1	0.82
Total		122	100

Parity

Results from the present study indicated that the occurrence of pyometra was highest in nulliparous (62.30%) bitches followed by primiparous (22.13%) and pluriparous (15.57%) bitches (Table 4). Similar to the results of present study an increased incidence of pyometra in nulliparous bitches was reported by several authors (Antonov *et al*., 2015 and Bhat *et al*., 2018) [1, 2]. Niskanen and Thrusfield (1998) [17] reported moderate increase in the risk of pyometra in nulliparous individuals. The reason for the apparently protective effect of pregnancy is unclear. The original endometrium is lost after pregnancy, and the new endometrial lining might differ in the susceptibility of its receptors to estrogen or progesterone. Fieni *et al*. (2014) [9] opined that allowing the dogs for mating during the first estrus after medical management possibly prevent pyometra as pregnancy helps to prevent the uterine disease. Although there is still no plausible explanation for the apparently protective effect of pregnancy, it is possible that the protective and risk factors associated with pyometra may vary between breeds, as suggested by Hagman *et al*. (2011) [10].

Table 4: Parity wise occurrence of pyometra

S. No	Parameter	Number of animals affected	Percentage
1	Nullipara	76	62.30
2	Primipara	27	22.13
3	Pluripara	19	15.57
	Total	122	100

Type of pyometra

Based on the cervical patency the occurrence of open and closed cervix pyometra in the present study was 85.25 per cent and 14.75 per cent, respectively (Table 5). Incidence of open pyometra is more common than closed pyometra as reported by several authors (Uçmak *et al*., 2012; Jitpean *et al*., 2014 and Bhat *et al*., 2018) [21, 13, 2].

Table 5: Type of pyometra based on cervical patency

S. No	Parameter	Number of animals affected	Percentage
1	Open	104	85.25
2	Closed	18	14.75
	Total	122	100

Conclusion

Pyometra is the most common reproductive pathological condition with an incidence of 17.04 per cent among various gynaecological ailments in bitches. The incidence was highest in nulliparous bitches and age group of 6 to 9 years was commonly affected. Open cervix pyometra was the common type of pyometra and Spitzes were the most affected breed of canines.

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