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OCCURRENCE OF PYOMETRA AMONG DOGS - A RETROSPECTIVE STUDY

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ABSTRACT

A retrospective study was conducted by reviewing the clinical records of small animal gynaecological cases maintained at University Veterinary Hospital (UVH), Mannuthy and Kokkalai over three years from June 2017 to May 2020. A total of 13,132 dogs were presented to both University Veterinary Hospitals, with different gynaecological problems over three years. The occurrence of pyometra in relation to overall canine gynaecological cases was 3.20 per cent. Among the confirmed pyometra cases, the occurrence was highest among Labrador Retrievers (19.52 per cent). The age-wise distribution of pyometra-affected animals showed that animals above six years had the highest occurrence (47.86 per cent) of the disease. Nulliparous animals showed the highest occurrence (75 per cent), followed by primipara (19.26 per cent). The major symptoms exhibited by pyometra-affected dogs were dullness (92.85 per cent) followed by vaginal discharge (70.95 per cent) and polydipsia (70.71 per cent). Vomiting was the less frequently reported symptom (34.04 per cent).

Keywords: Pyometra, Occurrence, Retrospective study

INTRODUCTION

The idea of cystic endometrial hyperplasia- pyometra (CEH-P) proposed by Dow (1957) suggested that hormonal alterations lead to CEH, which established secondary bacterial infection and pyometra. Pyometra is a disease condition of the uterus usually seen in non-bred bitches, characterised by pus accumulation in the uterus. Pyometra could be either open or closed-cervix pyometra (Nayana *et*

al., 2021). The predisposing factors of pyometra include CEH, bacterial infection, dioestrus and exogenous sex steroid administration (Nelson and Feldman, 1986). The overall occurrence of canine pyometra was recorded by various authors as five per cent (Gandotra *et al.,* 1993), 27.33 per cent (Dabhi and Dhami, 2007), 11.23 per cent (Renukaradhya, 2011) and 8.33 per cent (Robaj *et al.,* 2018). The occurrence of pyometra reported was 15.20 per cent for animals above four years old in colony-raised Beagle dogs (Fukuda, 2001). Niskanen and Thrusfield (1998) stated that most canine breeds had no breed-specific influence on pyometra, however, Egenvall *et al*. (2012) observed an increased breed pre-disposition for certain dogs. Smith (2006) reported that Rottweiler, Saint Bernard, Chow Chow, Golden Retriever and Rough Collie had an increased breed disposition for the occurrence of canine pyometra. A higher incidence of CEH-P cases was reported in the order Labrador Retriever, Rottweiler, Spitz, German Shepherds and Dachshunds, respectively (Chinnu, 2016). Dow (1958) suggested that nulliparous dogs were ten times at higher risk to develop pyometra, than pluriparous dogs. The present study highlighted the need for public awareness about canine pyometra for the timely intervention of the condition, to generate a better prognosis and to take necessary managemental and precautionary actions.

MATERIALS AND METHODS

Data obtained from the clinical records of University Veterinary Hospitals, Kokkalai and Mannuthy for the period of three years from June 2017 to May 2020 were analysed to study the occurrence of canine pyometra. Dogs presented with sanguineous to mucopurulent vaginal discharge of varying consistency, colour and odour with evidence of definite uterine sacculations on ultrasonography were recorded as animals with open-cervix pyometra and dogs which did not exhibit any vaginal discharge, presented with other symptoms of pyometra and confirmed with evidence of definite uterine sacculations on ultrasonography, were recorded as animals with closed-cervix pyometra.

The occurrence of pyometra among the total number of canine gynaecological cases presented to the small animal gynaecology units of both hospitals was recorded. Then cases were classified according to their age, breed and parity. The symptoms recorded in the case sheets and narrated by the owners of dogs that were confirmed with pyometra were collected and tabulated. Data on the occurrence of pyometra in relation to age and parity were analysed statistically by chi-square test using SPSS version 24.0.

RESULTS AND DISCUSSION

Occurrence of pyometra in relation to overall canine gynaecological cases

A total of 13,132 dogs were presented to the small animal gynaecology section of both hospitals with different gynaecological problems during three years. Out of 13,132 small animal gynaecological cases presented, 420 (3.20 per cent) were confirmed with pyometra which comprised of ten different breeds. The breed-wise distribution of pyometra cases is presented in Table 1. Occurrence of pyometra was more in Spitz (7.25 per cent), followed by non-descript dogs (6.19 per cent), German Shepherd (4.18 per cent), Bull Mastiff (3.90 per cent), Dobermann (3.75 per cent), Great Dane (3.65 per cent), Rottweiler (3.63 per cent), Dachshund (3.34 per cent), Labrador Retriever (2.58 per cent), Pug (2.53 per cent) and others breeds of dogs (1.11 per cent). The findings were similar to the occurrence reported by Gandotra *et al.* (1994) as they recorded an occurrence of pyometra in relation to overall gynaecological problems as five per cent. The occurrence of canine pyometra reported by Robaj *et al.* (2018) and Renukaradhya (2011) was 8.33 and 11.3 per cent, respectively whereas, Dabhi and Dhami (2007) reported canine pyometra as the most common reproductive ailment (27.23 per cent) among the canine gynaecological cases.

Occurrence of pyometra among dogs in relation to age

The age-wise distribution of pyometra affected animals is depicted in Table 2. It showed that animals above six years of age had the highest occurrence (47.86 per cent) of the disease followed by dogs aged between >3-6 years (37.38 per cent), and dogs between the age of >1-3 years (13.57 per cent). Only five animals below one year of age (1.19 per cent) had been reported with pyometra. The occurrence of pyometra was more common among older dogs. A highly significant difference in the age-wise distribution of pyometra ($p<0.01$) was observed. The study was in accordance with Dabhi and Dhami (2007) who reported and incidence of 85 to 88 per cent of pyometra in dogs above six years of age. Egenvall *et al*. (2012) also observed that the pyometra was higher in female dogs of more than eight years of age. In a study of 302 pyometra cases, 28.50 per cent of bitches were aged between five to seven years, 42.90 per cent were aged between eight to ten years and 15.90 per cent were aged between 11 to 13 years (Bledinger *et al*., 1991). This could be due to the age-dependent chronic progressive degenerative changes and cystic endometrial hyperplasia of the uterus mediated by increased levels of progesterone (Barrau *et al.,* 1975). Although almost all animals

Table 1. Occurrence of pyometra among total presented canine gynaecological cases (n= 13,132)

Breed	No. of dogs presented with gynaecological disorders	No. of dogs diagnosed with pyometra	Occurrence (Per cent)
Labrador Retriever	3173	82	2.58
Pug	1701	43	2.52
Rottweiler	1597	58	3.63
German Shepherd	1124	47	4.18
Spitz	1020	74	7.25
Dachshund	628	21	3.34
Non-Descript	533	33	6.19
Dobermann	400	15	3.75
Bull Mastiff	274	10	3.90
Great Dane	256	10	3.64
Others	2426	27	1.11
Total	**13,132**	**420**	**3.20**

developed CEH with advancing age, not all progressed to pyometra. CEH was not always an evident clinical sign in younger animals affected with pyometra (Verstegen *et al*., 2008), which was in alignment with the present study.

Occurrence of pyometra among dogs in relation to breed

Breed-wise distribution of pyometra-affected animals is depicted in Table 3. Among the 420 confirmed pyometra cases, Labrador Retriever showed the highest occurrence of pyometra among all the breeds (19.52 per cent). The proportion of other canine breeds affected with pyometra was Spitz (17.60 per cent), Rottweiler (13.81 per cent), German Shepherd (11.19 per cent), non-descript dogs (7.86 per cent), Dachshund (5 per cent), Dobermann (3.57 per cent), Great Dane (2.38 per cent), Bull Mastiff (2.38 per cent) and other breeds of dogs (6.43 per cent). The findings were in concurrence with the findings of Chinnu (2016). According to the author, frequent incidences of CEH-P cases were reported in the order of Labrador Retriever, Rottweiler, Spitz, German Shepherds and

Table 2. Occurrence of pyometra in relation to age of the dogs (n= 420)

Age	No. of dogs diagnosed with pyometra	Occurrence (Per cent)
Upto 1year	5	1.19
1-3 years	57	13.57
3-6 years	157	37.38
> 6 years	201	47.86

Chi-square value: 1024**; p-value: 0.001;
** Highly Significant at 1per cent level

Dachshunds, respectively. Egenvall *et al*. (2001) observed an increased breed predisposition for Rough Collie dogs. Smith (2006) reported increased breed predisposition for Rottweiler, Saint Bernard, Chow Chow, Golden Retriever and Rough Collie.

On the contrary, Niskanen and Thrusfield (1998) stated that most breeds had no breed-specific influence for the development of pyometra. The higher incidence of pyometra in the Labrador Retriever breed in the current study might be due to the higher presentation of this breed to the hospitals because of their relatively higher population in the locality of study.

Table 3. Occurrence of pyometra in relation to breed (n= 420)

Breed	No. of dogs diagnosed with pyometra	Occurrence (Per cent)
Labrador Retriever	82	19.52
Spitz	74	17.62
Rottweiler	58	13.81
German Shepherd	47	11.19
Pug	43	10.24
Non-Descript	33	7.86
Dachshund	21	5.00
Dobermann	15	3.57
Great Dane	10	2.38
Bull Mastiff	10	2.38
Others	27	6.43

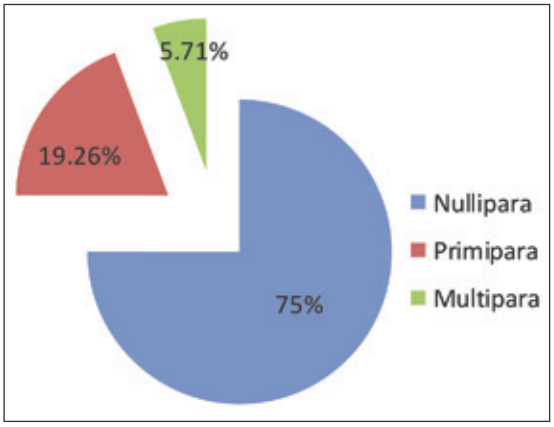
Occurrence of pyometra in relation to parity

Parity-wise occurrence of pyometra in dogs is depicted in Fig 1. Nulliparous animals showed the highest occurrence (75 per cent) followed by primipara (19.26per cent). Multiparous dogs showed only 5.71 per cent occurrence. The parity-wise distribution of pyometra showed a highly significant difference ($p<0.01$). Dow (1958) suggested that nulliparous dogs were ten times at higher risk of developing pyometra than pluriparous dogs. Kaymaz *et al*. (1999) and Hagman *et al*. (2011) also found a significant association between nulliparity and pyometra, reporting that 86.6 per cent and 86 per cent of pyometra cases occurred in nulliparous dogs, respectively. Similarly, an incidence of pyometra among nulliparous animals ranging from 69.63 to 79 per cent of total pyometra cases was reported by Ros (2014).

In nulliparous dogs, the cumulative effect of hormones could lead to more and more cystic proliferation and maintenance of intrauterine fluid which would act as a contusive environment for bacterial proliferation and subsequent establishment of pyometra (Nelson and Feldman, 1986; Fransson and Ragle, 2003).

Symptoms recorded in pyometra-affected cases

Figure 1. Occurrence of pyometra in relation to parity (n= 420)



Chi-square value: 768**; p-value: 0.001;
** Highly Significant at 1per cent level

The major symptoms exhibited by pyometra affected dogs were dullness (92.85 per cent) followed by vaginal discharge (70.95 per cent) and polydipsia (70.71 per cent). Vomiting was a less frequently reported symptom (34.04 per cent) (Table 4). Unnikrishnan (2018) also observed that in pyometra affected animals, 88.59 per cent of dogs showed vulval discharge and most animals showed dullness. Dullness in animals affected with pyometra could be due to the associated toxaemia and the vulval discharge indicating cervical patency in open-cervix pyometra cases.

Table 4. Symptoms exhibited by pyometra-affected dogs

Symptoms	No. of dogs affected	Per cent
Anorexia	268	63.80
Dullness	390	92.85
Vaginal discharge	298	70.95
Vomiting	143	34.04
Polyuria	291	69.28
Polydipsia	297	70.71

SUMMARY

The occurrence of canine pyometra was studied in relation to age, breed, parity and symptoms narrated by the owner after reviewing the clinical records of University Veterinary Hospitals, Mannuthy and Kokkalai, Kerala Veterinary and Animal Sciences University, for the past three years. Pyometra in dogs accounted for 3.20 per cent of all presented canine gynaecological cases. Labrador Retrievers (19.52 per cent), dogs above six years of age (47.86 per cent) and nulliparous dogs (75 per cent) showed the highest occurrence of pyometra. The major symptom exhibited by dogs affected with pyometra as narrated by the owner included dullness (92.85 per cent), vaginal discharge (70.95 per cent) and polydipsia (70.71 per cent).

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