



Retrospective epidemiological study of pyometra in dogs and cats seen at UEM veterinary hospital - data from 2015 to june 2021

Estudo epidemiológico retrospectivo de piometra em cães e gatos atendidos no hospital veterinário da UEM - dados de 2015 a junho de 2021

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1 INTRODUCTION

Pyometra is the name given to the inflammatory process and accumulation of mucopurulent secretion in the uterine lumen, caused by a cystic hyperplasia (CABRAL et al., 2016) resulting from an extensive hormonal influence (CHEN, ADDEO, SASAKI, 2007), concomitant to a bacterial infection. It can affect several species, but is more commonly observed in middle-aged dogs (CABRAL et al., 2016), with a higher rate of occurrence between 7 and 9 years. The incidence can reach 199 female dogs per 10,000 animals and 17 female cats per 10,000 animals (HAGMAN, 2018). It is one of the most common uteropathies in veterinary routine (GARCIA FILHO et al., 2012) and whose importance is related to its severity. In the meantime, both its diagnosis and early treatments guarantee a good prognosis, especially in cases of closed pyometra, when there is a high risk of septicemia with evolution to death (OLIVEIRA et al, 2017).

The etiological agent most related to this pathology is the bacterium *Escherichia coli*, with high affinity for tissues of the urinary tract, endometrium and myometrium of dogs (SANDHOLM, VASENIUS, KIVISTO, 1975). Its endotoxins cause several clinical manifestations of varying degrees of severity, such as kidney injury, medullary immunosuppression and hepatic cholestasis (CONRADO, 2009). Pyometra manifests itself during the diestrus phase, also called luteal phase, when there is a peak in the production of the hormone progesterone. In this phase, due to this hormonal imbalance, there is an inhibition of myometrial activity, resulting in fluid retention in the uterine lumen, which predisposes to the appearance of the condition (NELSON, COUTO, 2015). The three main causes of pyometra reported in the scientific literature constitute: repeated estrous cycles (increasing blood progesterone), use of injectable contraceptives and opportunistic infections of infectious agents that ascend through the cervix towards the uterus (DYBA et al, 2021; OLIVEIRA et al, 2019).



Pyometra can be classified as open or closed, depending on the presence or absence of vaginal discharge. Cases considered as closed are more severe precisely because of the absence of more specific clinical manifestation, and the diagnosis is usually established by the presence of vaginal discharge, uterine distension and abdominal pain (HAGMAN, 2018). However, other clinical signs may also be associated, and these are inappetence, lethargy, tachycardia, tachypnea, anorexia, diarrhea, polydipsia, polyuria, vomiting, fever, dehydration and weight loss, along with uterine enlargement perceived through palpation - which must be performed delicately so that there is no uterine rupture - especially in these cases of closed pyometra (NELSON; COUTO, 2015).

The preliminary diagnosis of the occurrence should be proposed through the animal's history and its general physical examination. For the differential diagnosis, gynecological examinations, complete blood counts and the use of abdominal ultrasound as the main tool are recommended (HAGMAN, 2018). It has that ultrasound brings the advantage of detecting intrauterine fluid (anechoic to hypoechoic fluid), as well as exposes the measurement of the uterus, also pointing possible pathologies in the tissues of the uterus and ovary (CABRAL et al, 2016).

The treatment of choice is ovariohysterectomy (OVH), especially in cases of closed pyometra. Antibiotic therapy is also prescribed (DYBA et al, 2021), which should be extended for a few days postoperatively, in addition to accurate and continuous evaluation (HAGMAN, 2018). However, depending on the condition of the cervix, treatment can take place clinically (OLIVEIRA et al 2017). Although it presents a good prognosis and the mortality rate is shown to be low (3% to 20%) (TRAUTWEIN et al, 2018), there is still the risk of developing complications or systemic problems, such as peritonitis, sepsis, uterine rupture, inflammatory response syndrome, endotoxemia, acute renal failure, with the possibility even of evolution to death (HAGMAN, 2018; CABRAL et al 2016; OLIVEIRA et al, 2017; OLIVEIRA et al, 2019).

In view of the information presented, based on some aspects that are still not well elucidated about the various predisposing factors, the association with immune response and its possible bacteriological characterization (SANTANA, SANTOS, 2021), added to the scarcity of epidemiological data on pyometra in the region of Umuarama-PR, it is important to study and observe this pathology, enabling the establishment of a more concise pattern among the cases seen in the region. Moreover, such compilation will help in a better understanding of its pathogenesis, enabling the determination of the best



treatment and prevention protocol, on behalf of a good prognosis, well-being and quality of life for patients.

2 OBJECTIVE

The present study aims to perform an epidemiological and statistical survey of the cases of pyometra in female dogs and cats that were treated at the Veterinary Hospital of the Universidade Estadual de Maringá. Influences related to factors such as species, age, breed, size and clinical history of these patients will be observed, and the grouping of data will also allow the verification of follow-up and consequent outcome of cases, among other evaluations relevant to the understanding and mapping of occurrences of pyometra in these animals. Thus, it will result in greater visibility and understanding of the subject.

3 METHODOLOGY

The data survey and analysis were performed from the records and observations present in the medical records made available by the Veterinary Hospital of UEM, based in the city of Umuarama/PR, dated from 2015 to June 2021.

The epidemiological study, therefore, took place in the retrospective modality and the data collected from each individual form were transferred to a pre-established spreadsheet using the Microsoft Excel® program. The parameters of interest were: species; breed; size (small, medium or large for dogs); age; animals never crossed; number of previous births; treatment; clinical history; pyometra form (open or closed); need or not of surgical intervention and disease outcome (cure or death). Thus, it was possible to compile and evaluate the data, obtaining statistical results in percentage and numerical form for the most relevant variants in question.

To write the research, a bibliographic review was conducted, based on the analysis of pertinent data recorded in books and current scientific articles. Thus, to search for bibliographic sources, the databases ScienceDirect, Scientific Electronic Library Online (SciELO), Mendeley, ReserchGate, Scholar Google, Portal de Periódicos CAPES, university journals, and PubMed were used, and, as a criterion, literature data dating mostly from the last five years were given priority. The discussion addresses the results obtained, establishing comparisons with existing data from similar scientific research made available to date.

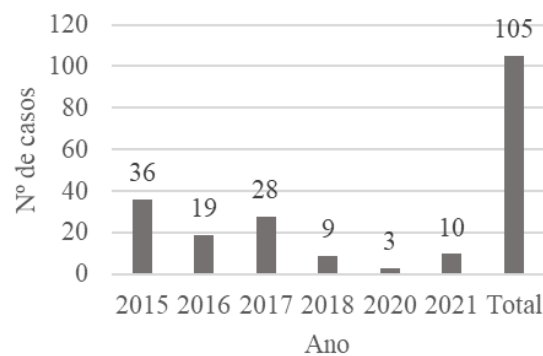


4 DEVELOPMENT

The research occurred by gathering 4,050 records of care filed since 2015 in the Veterinary Hospital of the State University of Maringá to be analyzed and filtered into records of interest, in retrospect, evaluating the following parameters: year of occurrence, species, breed, size, age, history of crossbreeding, history of births, form of pyometra, whether there was surgical approach and outcome of the case. Such parameters were selected in order to obtain a comprehensive notion of the occurrence of this condition in the region of Umuarama-PR, as well as the measures taken and its prognosis.

Of the 4,050 attendance records, only 105 were of interest to this research. These were 36 from the year 2015, 19 from the year 2016, 28 from the year 2017, 9 from the year 2018, 3 from the year 2020, and 10 from the year 2021, demonstrated in Chart 1 below.

Graph 1. Number of cases of pyometra per year, according to the analysis of care records.



The 2019 forms were archived in an online manner and the data was lost due to a network and storage failure. Therefore, these were not included in the study. The drop in the number of cases in the years 2020 and 2021 was due to the social isolation and temporary closure of the Veterinary Hospital of the State University of Maringá due to the global Covid-19 pandemic.

From the total number of cases that were reported (105), 98 cases were in female dogs, resulting in a total of 93.33%, and only 7 were referred in female cats, representing the rest, 6.66%. The information regarding female and female cats will be divided for better understanding and arrangement in the study.

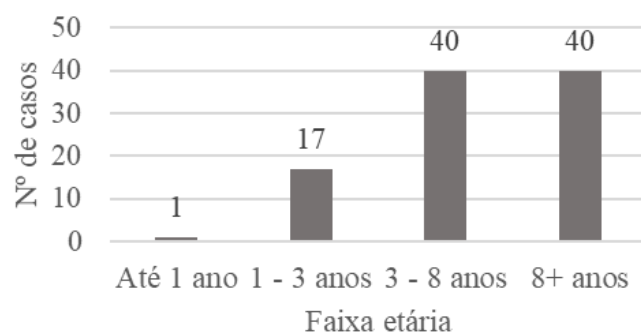


Dogs

Within the total number of cases (98), 51 of them (52.04%) were in female dogs of undefined breed (SRD), and 47 (47.95%) in female dogs of defined breed, with no predominant breed in the incidents. Regarding the size parameter, the main ones were small-sized animals, with a total of 45 cases (45.91%). In medium-sized animals, there were 20 cases (20.40%) and in large ones, 33 cases (33.67%).

For age, the main ranges were between 3 and 8 years and animals over 8 years. All data regarding age are shown in Graph 2 below. Only one case (1.02%) of pyometra was found in a female dog up to 1 year of age, 17 cases (17.34%) in the range of 1 and 3 years, 40 cases (40.81%) in female dogs between 3 and 8 years, and 40 cases (40.81%) in female dogs over 8 years.

Graph 2. Number of pyometra cases relative to each age group.



In relation to the parameters of occurrence of birth and mating, in 41 cases (41.83%) the owner did not know whether there had been any copulation during the bitch's life, 24 cases (24.48%) were reported without any mating and in 33 dogs (33.69%), the guardians informed that there had been, at some moment, coitus. Among the total number of cases, 45 (45.91%) had no information on previous births, 33 dogs (33.69%) had never had a birth during their lives and only 20 (20.40%) had had a pregnancy during their lives.

About the specification of the pyometra form, 41 (41.83%) dogs presented the closed form of the problem and 57 (58.16%) the open form. In addition, 90 (91.83%) of the total cases had surgical intervention by ovariohysterectomy and only 8 (8.16%) were treated conservatively.

For the outcome, 90 (91.83%) animals were cured of the disease, 4 (4.08%) dogs died, and 4 (4.08%) had no information relevant to this case study.



Gatas

Within the total number of cases in cats (7), 5 (71.42%) were not breed defined (SRD) and 2 (28.57%) were Siamese, all between 3 and 8 years old. Regarding the form of pyometra, 4 patients (57.14%) had the open form and 3 (42.85%) had the closed form. Regarding surgical intervention, only one cat (14.28%) had conservative treatment, all other 6 (85.71%) were referred for ovariohysterectomy. In all cases, the outcome was the cure of the disease.

The lack of data regarding cat data is due to the lack of information in the history and history sheet of each patient.

5 DISCUSSION

In view of the results obtained, the mean age found in the affected dogs was 6.66 years, a result similar to that observed in the study by Dyba et al. (2021), in the southwestern region of Paraná, where the author indicates a mean age of 6.65 ± 1.02 years in the cases evaluated. In the same study, the author also mentions that 81.83% of patients presented the open form of pyometra, thus composing the majority of cases analyzed, as was also observed in the present study.

In a second study conducted by Borges et al. (2021), all cases that received the diagnosis of pyometra were referred to the ovariohysterectomy procedure, as well as the study of Dyba et al. (2021), where 85.71% of animals had the same treatment. Such information ratifies the study presented here, and is consistent with Silva (2018), who points out that the use of this technique eliminates the focus of origin of the affection, in this case the female reproductive tract, and prevents against recurrences, being, therefore, the treatment of choice for pyometra.

Also in the study presented by Borges et al. (2021), dogs without a defined breed made up most of the sample evaluated, as reported in this study, and also as the author points out to have occurred in other studies conducted in Brazil.

6 CONCLUDING REMARKS

In view of the results obtained, it is concluded that female dogs and cats over 3 years of age are the most affected by the problem, with an average age of 6 to 7 years in the case of female dogs. It is also found that there is no predominant breed that has some predisposition, and most patients recorded here do not have a defined breed. Seen the results obtained with ovariohysterectomy, it is confirmed that this is still considered the



gold standard treatment for the cure of pyometra, also serving as a prophylactic method, and that the most frequent way of this is through the open form of the disease. Furthermore, little is certified about the interaction between crossbreeding and calving and the disease itself.



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