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Evaluation of Breed, Age, Clinical manifestation, Diagnosis and Treatment for Canine Pyometra

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ABSTRACT

Pyometra among the canines is characterized by the presence of purulent material within the uterus and is primarily seen during the diestrus phase of the estrus cycle. The primary reason is progesterone, which stimulates increased secretory activity of endometrial glands resulting in endometrial proliferation, decreased contractility of the myometrium and ultimately, cervical closure. Also, it decreases the leucocyte response of the uterus and makes it prone to bacterial infection, with *Escherichia coli* being the most commonly isolated pathogen. During the period of two years, a total of 2500 dogs with various ailments were presented to the clinics. Among these dogs, 194 female dogs had a primary complaint of polyuria, polydipsia, and abnormal vaginal discharge. The majority of the animals were having chronic kidney disease (53%), followed by hepatic disease (26.3%), pyometra (11.8%), and diabetes mellitus (2.5%). In the rest of the animals, a primary diagnosis was not reached, and they were sent to the referral hospitals to reach a diagnosis. The majority of the animals with pyometra were 6-9 yrs of age (n=18), and the rest of the animals were 3-5 yrs of age (n=5). Spitz was the most commonly presented breed, followed by Labrador retriever, rottweiler (8.6%), pitbull (8.6%), non-descript (8.6%), dachshund (4.3%), and pointer (4.3%). Most commonly presented clinical signs were inappetence to anorexia and lethargy (n=23), followed by polydipsia (n=15), polyuria (n=13), and vomiting (n=6). Obvious purulent vaginal discharge was present in fourteen animals, whereas two animals had hemorrhagic vaginal discharge. In the rest of the animals (n=7), there was no evidence of vaginal discharge, and they were classified as closed-cervix pyometra. Diagnosis was made based on blood workup findings, such as severe leukocytosis in fifteen and concurrent azotemia in only five animals. Closed-cervix pyometra is highly associated with impaired renal health in the affected animals. Radiography was performed only in animals with closed cervix pyometra, and the findings were enlarged uterine loops in the middle to caudal abdomen displacing intestinal loops dorsally (n=4). Treatment in affected animals involves ovariohysterectomy. No postoperative complication was noticed postoperatively, and the suture was removed 14 days post-surgery.

Keywords: Diestrus, *Escherichia coli*, Ovari, Progesterone, Pyometra, Vaginal discharge.

INTRODUCTION

Canine pyometra is a common reproductive disease of intact female dogs characterized by the accumulation of purulent material in the uterus. It typically develops during the diestrus phase of the estrus cycle, with every one-fourth of the female dog affected up to ten years of age (Kumari *et al*, 2010). About 19% of the animals are affected before 10 yrs of age (Jitpean et *al*, 2012) and about 20% of the dogs are diagnosed after 10 yrs of age (Jitpean et *al*, 2014). The Diestrus phase is characterized by increased activity of progesterone, which leads to increased secretory activity of endometrial glands, causing increased endometrial proliferation, decreased contractility of the myometrium, and ultimately causing cervix closure (Pretzer, 2008). This phase is also associated with decreased leucocyte response of the uterus, causing the uterus to become more prone to bacterial infection, with Escherichia *coli* being the most commonly isolated pathogen from the affected animals (Hagman, 2018). The other isolated pathogens include *Staphylococcus pseudointermedius* and *Streptococcus canis* (Xavier *et al*, 2023).

Certain breeds are at increased risk for the development of pyometra, with Indian spitz, Labrador retriever, Alsatian, Doberman pinscher, Boxer, and

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Dachshunds being more prone as compared to Golden retriever, spaniels, and Irish setters in Indian conditions (Shiju *et al*, 2011). Administration of certain drugs, such as progesterone or estrogen compounds, which mainly serve the purpose of reproduction control among the canine population, has been recognized as a predisposing factor for the development of pyometra in canines (Whitehead, 2008; Sala *et al*, 2021). These drugs, apart from causing pyometra, are associated with the development of other conditions such as fetal maceration, mammary tumors, and insulin resistance.

Clinical signs in canine pyometra may vary from mild to life-threatening signs in extreme cases due to the development of sepsis and multi-organ dysfunction syndrome (Jitpean et *al*, 2016). Clinical signs are typically seen two to four months post-estrus and include the presence of purulent to hemorrhagic vaginal discharge in open-cervix pyometra and its absence in case of closed-cervix pyometra (Pretzer, 2008). Apart from these local signs, systemic signs among the affected individuals include anorexia, depression, polyuria, polydipsia, and vomiting (Jitpean et *al*, 2014). Potential complications associated with pyometra include uterine rupture leading to peritonitis, renal failure, endotoxemia, and ultimately death (Rautela *et al*, 2019).

Diagnosis in canine pyometra is quite obvious in cases of open-cervix pyometra, owing to the presence of purulent to hemorrhagic vaginal discharge. Dogs with closed-cervix pyometra are difficult to diagnose due to the absence of conclusive signs. Diagnosis of these dogs is based on history, clinical signs, blood workup including complete blood count, serum biochemistry, radiography, and ultrasonography. Leukocytosis, anemia, and azotemia are commonly seen abnormalities on the blood workup of the affected animals (Hagman, 2022). Ultrasonography is the diagnostic test of choice for pyometra with enlarged uterine horns containing hypoechogenic contents.

Canine pyometra is an emergency condition requiring immediate intervention in the affected animal. Surgical ovariohysterectomy remains the treatment of choice. The potential complications associated with the surgical method include hemorrhage, stump-pyometra, estrogen-responsive urinary incontinence, and ovarian remnant syndrome (Howe, 2006; Ball *et al.*, 2010). Medicinal treatment is preferred in animals with open-cervix pyometra with no ovarian cysts and that are younger in age. Contraindications for medical management include the presence of fever or hypothermia, evidence of peritonitis or sepsis, or organ dysfunction, as in these cases, sepsis can very quickly transform from a mild case to a life-threatening emergency. The primary aim in medicinal treatment is to minimize the effects of progesterone by decreasing its production or reducing its action or both, eliminating the uterine infection, inducing relaxation of the cervix, and expulsion of the purulent material from the uterus (Hagman, 2018). Preventive measures involve elective ovariohysterectomy. Progesterone receptor blockers or prostaglandins prevent the development of pyometra in high-risk patients (Mir*et et al.*, 2013).

MATERIALS AND METHODS

This study was conducted over a period of two years (October 2023 to October 2025) at the Veterinary polyclinic, Faridkot. A total of 2500 dogs presented to the hospital with various ailments were enrolled in this study. Among these, 194 female dogs were presented with the primary complaint of polyuria, polydipsia, and abnormal vaginal discharge and were screened to rule out the primary cause of the disease. Anamnesis, physical examination, routine blood workup, including Complete blood count (CBC) and serum biochemistry from the local laboratories using appropriate methodology. Radiography and ultrasonography from the referral hospital to confirm the disease, if required, and routine urinalysis with sediment examination were performed in these animals to elucidate the cause of the disease.

The majority of these animals were diagnosed with chronic kidney disease (n=103), followed by hepatic disease (n=51), pyometra (n=23), and diabetes mellitus (n=5). In the rest of the dogs (n=12), diagnosis cannot be established using the above-mentioned procedures and were referred to the referral hospital for further consultation. Female dogs in which the primary diagnosis of pyometra was established were included in this study. A total of 23 animals were diagnosed with pyometra. All these pet owners were advised of surgical ovariohysterectomy, but only 15 pet owners gave consent for the surgical treatment of pyometra and were included in this study.

In these dogs, various parameters such as age, breed, clinical signs such as presence of purulent or hemorrhagic vaginal discharge, inappetence, anorexia, polyuria, polydipsia, and vomiting were noted down. Apart from this, the presence of any complications, if any, such as fever, hypothermia, or peritonitis, was also recorded. Diagnosis was based on history of diestrus phase of estrus cycle, i.e., four weeks to four months

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after the estrus, physical examination including presence or absence of purulent or hemorrhagic vaginal discharge, abdominal enlargement secondary to enlarged uterus, routine blood workup, and radiography performed from local laboratories. Ultrasonography was not available at the present hospital, so dogs suspected of pyometra, but with non-diagnostic findings in radiography and blood workup, were referred to the referral hospital to confirm the cause of the disease. Ovariohysterectomy was performed in all these animals using the appropriate guidelines by Fossum (2018), and the presence of any surgical complication, if any, was recorded. All the above findings were noted in Microsoft Excel, and descriptive analysis was performed. Along with this, the Pearson correlation coefficient (r) to quantify linear relationships of pyometra with systemic infection and renal markers was applied.

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RESULTS AND DISCUSSION

Among the 2500 animals presented to the clinic with various ailments, 194 female dogs were presented with the primary complaint of polyuria, polydipsia, and abnormal vaginal discharge. The majority of these cases were diagnosed as chronic kidney disease (53%) based on history, routine blood workup findings such as anemia and azotemia (elevated BUN and Creatinine), urinalysis findings such as hyposthenuria to isosthenuria urine in the presence of dehydration, and ultrasonographic findings including loss of cortico-medullary differentiation from the referral hospital.

Hepatic diseases (26.3%) were the second most common cause during this study among dogs presented to the clinics. Diagnosis in these animals was based on history, elevated liver enzymes, elevated levels of bilirubin, and ultrasonography in some cases.

Diabetes mellitus (2.5%) was diagnosed in five female dogs based on persistent hyperglycemia and glucosuria. The more reliable test, i.e., serum fructosamine, was not performed in these animals due to the unavailability of this test at the local laboratories. After the diagnosis had been made, the affected animals were treated using the American Animal Hospital Association (AAHA) guidelines (Behrend *et al*, 2022).

Pyometra (11.8%) was diagnosed in 23 animals, but only 15 pet owners complied with the surgical treatment and were included in this study. Diagnosis in these animals was based on a history of purulent vaginal discharge in the majority of the animals (n=14), hemorrhagic vaginal discharge, which later on became purulent in only a few (n=2) animals. In the rest of the animals, there was no history of any type of vaginal discharge (n=7); these findings are in accordance with the previously done studies by Jitpean *et al* (2016), where vaginal discharge was present in 76.7% of the animals presented.

All the animals presented were in anorectic to anorectic with lethargy (n=23), polyuria (n=13), and polydipsia (n=15); vomiting was present in only a few animals (n=6). These findings are in accordance with the previously done studies by Jitpean *et al* (2016), where 69% of the animals were presented with anorexia, 61%of the animals were lethargic, polydipsia, polyuria, and vomiting were present in 61.6%, 59.4% and 21.1% of the animals, respectively.

Blood workup findings include significant elevation in the leukocyte counts on CBC in the majority of the animals (n=15), and concurrent azotemia was present in only a few animals (n=5). These findings were in association with Xavier *et al* (2023), and a possible reason may be due to the presence of endotoxemia, glomerular dysfunction, renal tubular damage, and decreased response of tubules to anti-diuretic hormone. In Pearson correlation r (Pearson r; significant at $p < 0.05$), a strong negative correlation with vaginal discharge ($r = -0.73$ for creatinine, -0.75 for BUN) was found; closed pyometra (nonappearance of discharge) sturdily correlates with higher renal problem, representing greater renal stress due to endotoxin buildup. TLC showed a strong positive correlation ($r = 0.97$), and elevated TLC correlates strongly with renal impairment, reflecting systemic complications of pyometra.

Radiographic findings such as enlarged uterine loops in the middle to caudal abdomen, causing dorsal displacement of the intestines, were present mainly in animals with closed cervix pyometra (n=4). Animals presented with obvious purulent vaginal discharge were not subjected to any of the radiographic diagnostics. Ultrasonography was done by the referral hospital and yielded a diagnosis in affected animals with non-conclusive signs and a lack of diagnosis by the previously mentioned diagnostics.

The most commonly presented breeds were spitz (43.4%), followed by Labrador retriever (21.7%), rottweiler (8.6%), pit-bull (8.6%), non-descript (8.6%), dachshund (4.3%), and pointer (4.3%). These findings are in accordance with the studies of Shiju *et al* (2011), in which pyometra was most common among

spitz (39.56%), followed by labrador (12.94%), alsatian (11.87%), non-descript dog (11.51%), doberman (7.19%), boxer (3.95%), and dachshund (2.87%). The possible reason may be due to higher diestrus hormonal disorder susceptibility among these breeds or due to the over-presentation of these breeds in the clinics.

As far as age was concerned, the majority of the animals were 6-9 yrs of age (n=18), and the rest of the animals were between 3-5 yrs of age (n=5). The median age of presentation during this study was seven years. These findings are in association with the findings of Hagman (2018), which states that the disease typically affects middle-aged dogs with a median age at the time of diagnosis being seven years. Treatment in these affected animals includes ovariohysterectomy. Medicinal treatment was not performed, as the primary choice of treatment was only included as a preoperative measure. Fifteen pet owners comply with the surgical treatment. Ovariohysterectomy was performed on these fifteen animals in accordance with the guidelines of Fossum *et al* (2018). Postoperative medication includes broad-spectrum antibiotics and analgesics. Postoperative care was advised to pet owners, and suture removal was done 14 days post-surgery. No surgical complication was noticed in any of these animals, and all the above animals recovered well post-ovariohysterectomy. This study was performed with the primary aim of knowing the age and breed-wise prevalence of canine pyometra in the clinics over a period of two years.

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CONCLUSION

Canine pyometra is a common reproductive disorder of the intact female dog; a study highlights the disease's prevalence in middle-aged dog breeds. Clinical findings show the serious need for early detection and surgical intervention to alleviate systemic complications, mainly renal stress. Future research should explore breed-related predispositions and long-term outcomes to enhance preventive strategies. Need to emphasize owner education and routine spaying to prevent this life-threatening complication.

REFERENCES

Ball R L, Birchard S J, May L R, Threlfall W R and Young G S (2010). Ovarian remnant syndrome in dogs and cats: 21 cases (2000–2007). *J Am Vety Med Assoc* **236**(5):548-53.

Behrend E, Holford A, Lathan P, Rucinsky R and Schulman R (2022). 2018 AAHA Diabetes Management Guidelines for Dogs and Cats Ã.

Fossum T W. Small Animal Surgery E-Book: Small Animal Surgery E-Book: Pyometra pp.818-824.

Hagman R (2018). Pyometra in small animals. Veterinary Clinics of North America: *Small Anim Pract* **48**(4):639-61

Hagman R (2022). Pyometra in small animals 2.0. Veterinary Clinics of North America: *Small Anim Pract* **52**(3):631-57

Howe L M (2006). Surgical methods of contraception and sterilization. *Theriogenology* **66**(3):500-9

Jitpean S, Ambrosen A, Emanuelson U and Hagman R (2016). Closed cervix is associated with more severe illness in dogs with pyometra. *BMC Vety Res* **13**(1):11

Jitpean S, Hagman R, Ström Holst B, Höglund O V, Pettersson A and Egenvall A (2012). Breed variations in the incidence of pyometra and mammary tumours in Swedish dogs. *Reprod Domestic Anim* **47**:347-50

Jitpean S, Ström Holst B, Emanuelson U, Höglund OV, Pettersson A, Alneryd-Bull C and Hagman R (2014). Outcome of pyometra in female dogs and predictors of peritonitis and prolonged postoperative hospitalization in surgically treated cases. *BMC Vet Res* **10**(1): 6 . https://doi.org/10.1186/1746-6148-10-6

Kumari Baithalu R, Maharana B R, Mishra C, Sarangi L, Samal L (2010) Canine pyometra. *Vety World* 3(7):340.

Mir F, Fontaine E, Albaric O, Greer M, Vannier F, Schlafer DH, Fontbonne A (2013). Findings in uterine biopsies obtained by laparotomy from bitches with unexplained infertility or pregnancy loss: an observational study. *Theriogenology* **79**(2):312-22

Pretzer S D (2008). Clinical presentation of canine pyometra and mucometra: a review. *Theriogenology* **70**(3):359-63

Rautela R, Katiyar R (2019). Review on canine pyometra, oxidative stress and current trends in diagnostics. *Asian Pacific J Reprod* **8**(2):45-55

Sala P L, Assis M M, Ribeiro R C, Sá T C, Rocha A G, Maia L T, Silva T P, Trentim M S, Quessada A M (2021). Does a single application of contraceptive cause pathological changes in bitches? Arquivo Brasileiro de Medicina Veterinária e Zootecnia 73:752-6

Shiju Simon M, Ganesh R, Arunprasad A, Kumar R S (2011). Incidence of pyometra in bitches-a survey of 278 cases. *Tamilnadu J Vet Anim Sci* **7**:252-3

Whitehead M L (2008). Risk of pyometra in bitches treated for mismating with low doses of oestradiol benzoate. *Vety Record* **162**(23):746-9

Xavier R G, Santana C H, de Castro Y G, de Souza T G, do Amarante V S, Santos R L, Silva R O (2023). Canine pyometra: A short review of current advances. *Animals* **13**(21):3310

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