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PYOMETRA

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Abstract

Pyometra is defined as a purulent inflammation of the uterus. This disease mostly involves elderly female dogs, which are sexual active. In our case it was diagnosed pyometra in 30 female dogs and 15 of them were treated in veterinary ambulance D-r Stojanoski in Bitola, and 15 of them were treated in veterinary ambulance Dameski in Prilep. This disease has a complex etiology. In the etiology of this disease are included hormonal factors and pathogen bacteria. The

hormone progesterone is the main reason and occurs increased secretion in the uterus, also the uterine bacterial immunity is reduced. The pathogen bacteria occurs purulent inflammation in the uterus and endotoxin secretion which can occur sepsis and peritonitis. Generally clinical signs of this disease are fever, polydipsia, polyuria, vaginal discharge, anorexia, abdominal pain. The disease is diagnosed by clinical signs, radiography, ultrasonography and hematology. The pyometra can be treated with surgical – ovariohysterectomy and nonsurgical (medical) approach.

Key words: purulent inflammation, progesterone, ovariohysterectomy, uterus, blood analysis.

Introduction

Pyometra in pets occur purulent inflammation of the uterus which is filled with pus. This disease occurs puss filled uterus in elderly female dogs, also this disease is diagnosed in other animal species (A. Egenvall et al.,2001). This very dangerous and life-threatening disease, includes adult intact female dogs, which are not neutered and if it is diagnosed in time the prognosis is very good. The etiology of this disease is complex and multifactorial and is not yet completely understood. This disease is characterized with acute and chronic bacterial infection of the uterus after estrus, and the uterus is filled with inflammatory fluid, also there are a lot of clinical and pathological signs which can be local or systemic represented (C. Dow,1959). The most represented pathogen bacteria isolated from the uterus is *Escherichia coli*.(R. Hagman, C. Greko,2001). Pyometra has a lot of clinical signs which can be life threaten. Diagnosing this disease is very easy if there are expressive clinical signs, but can be very confused if there is not vaginal discharge and clinical signs. The safest treatment of this disease is ovariohysterectomy of the animal, but in some cases can be used nonsurgical (medical) methods.

Materials and methods

Diagnosing this disease is very easy if there are represented expressive clinical signs and vaginal discharge. For diagnosing this disease were used information from anamnesis and clinical examination, hematological and blood analysis, ultrasonography and radiography of the abdomen. In our case were included 30 female dogs with pyometra from the region in Bitola and Prilep, 15 of them were treated in veterinary ambulance Dameski in Prilep, and 15 were treated in veterinary ambulance D-r Stojanoski in Bitola.

Results

In clinical examination of the female dogs 18 of them were 8-15 years old and 12 of them were 5-10 years old, also all of them were from different breed and were not neutered. In clinical examination in most of them were included clinical signs like: anorexia, depression, lethargy, tachycardia, tachypnea, weak pulse quality, fever, dehydration, vomiting, abdominal pain in palpation and gait abnormalities. 22 of them have mucopurulent vaginal discharge, and 8 of them have vaginal discharge with blood. In examination most of them have normal body weight and in abdominal palpation the uterus was increased. The abdominal palpation must be very careful to avoid rupture of the fragile uterus and that can occur peritonitis which can be life threaten. In cases when female dogs have increased abdomen, dog owners think that increasing is from pregnancy or fatness. In small number of female dogs the body weight was increased and the

increased abdomen was difficult to see. The abdomen can increase in few weeks or dramatically for few days.



Picture 1. Uterus with pyometra after ovariohysterectomy with weight of 3 kg in veterinary ambulance Dameski

From the hematological analysis in 27 female dogs the number of leukocytes was increased (WBC) (leukocytosis) for 3 to 5 times, the number of erythrocytes was reduced (RBC) (erythropenia) and the number of platelets (PLT), hemoglobin (Hgb), hematocrit (Hct), MCH (mean corpuscular hemoglobin), MCHC (mean corpuscular hemoglobin concentration) and iron levels(Fe) were normal.

From biochemical analysis the liver enzymes (ALT, AST), triglycerides, urea and creatinine were normal, but in small number of the female dogs were increased. When pyometra lasts for a long time the bacteria endotoxins, which are lipopolysaccharide products occur liver and kidney damage.

In ultrasonography examinations in most of the female dogs the uterus has cervical endothelial hyperplasia, ovarian cysts and it was filled with fluid. Differential diagnoses include mucometra, hydrometra, and hemometra that may have similar clinical presentation and ultrasonography findings. Vaginoscopy is helpful for determining the origin of a vaginal discharge. In radiography findings in bigger number of the female dogs were identified big tubular structures in caudoventral abdomen which were increased parts of the uterus.

Discussion

From the results we can see that this disease obtains not neutered, elderly female dogs from 7 to 18 years, but there are also cases when this disease appears in junior female dogs (A. Egenvall, et al.,2001;R. Hagman, et al. 2014).The middle age for diagnosing this disease is 5 years, or age of 10 months to 20 years(R. Hagman et al., 2014; A.P. Davidson et al., 1992).In our research in both ambulances female dogs are senior and not neutered which is the main reason for this disease, because they have hormone progesterone which levels are high 2 months after estrus. The high levels of this hormone occur accumulating fluid in the uterus because there are not contractions and the number of bacteria is increased which are the main reasons for purulent inflammation. The white blood cells (leukocytes) that protect uterus from infection in estrus

can't enter in the uterus. This is a natural process that can enable spermatozooids enter into the uterus without their inactivation from the immune system. From the other side this enables increasing the number of bacteria and inflammation of the uterus. The hormone progesterone occurs cystic endometrial hyperplasia and increase the uterus sensitivity to infections (G.C. England et al., 2012;J.E. Cox 1970). The other factors that increase the risk from this disease are using hormonal drugs for postponing estrus and drugs for artificial abortion. All patients who use hormonal therapy must have veterinary supervision (M. Niskanen, M.V. Thrusfield, 1998; A.G. Von Berky, W.L. Townsend 1993).

The treatment of pyometra can be surgical or nonsurgical (medical). In our study 27 of the female dogs were treated surgical. Surgical healing is safest and most effective because the bacteria and infection are completely removed. Prior to surgery, the patient is stabilized with adequate fluid intravenous therapy to correct [hypotension](#), hypoperfusion, shock, dehydration, acid-base balance and electrolyte abnormalities, coagulation disturbances, and organ dysfunctions. Broad – spectrum bactericidal antimicrobials are administrated intravenous, the most used broad- spectrum antimicrobial drug is ampicillin and it is used against *Escherichia coli*.(R. Hagman, C. Greko, 2005).Removal of the infection is the key against endotoxemia and sepsis. Anesthesia and perioperative management are focused on maintaining [hemodynamic](#) function, gastrointestinal function and protection, pain management, cellular oxygenation, nutrition, and nursing care. The ovariohy terectomy was done very careful because the uterus may be large, friable, and prone to rupture, and it is important to handle the tissues carefully. The [abdominal cavity](#) should be protected from accidental leakage of pus via uterine laceration which can occur peritonitis with ligating vessels in the broad ligament. For reducing the pressure from the urine bladder it was made cystocentesis.



Picture 2. Surgical treatment of pyometra in veterinary ambulance D-r Stojanoski

The prognosis for survival, mortality, health status is considered guarded to good, and laboratory abnormalities are normalizing 2 weeks after surgical treatment.

With nonsurgical (medical) treatment were treated 3 healthy breeding female dogs with open cervix and no ovarian cysts. In this cases it is important that the patients are stabilized, were used

antimicrobial drugs against sepsis and peritonitis. Were normalized hypothermia, organ dysfunctions and were eliminated clinical signs. The strategies of medical treatment are to minimize effects of [progesterone](#) by preventing its production and action, eliminate the uterine infection, promote relaxation of the cervix and expulsion of the intraluminal pus, and facilitate uterine healing. Commonly used hormonal drugs are [prostaglandin](#) F_{2α} (PGF_{2α}) or its synthetic analog cloprostenol, dopamine agonists (cabergoline and bromocriptine), or [progesterone-receptor](#) blockers (aglepristone). A.G. Von Berky, W.L. Townsend 1993; M. Niskanen, M.V. Thrusfield 1998). These hormonal drugs are luteolytic and uterotonic which stimulate smooth musculature of the uterus.

Table 1. Drugs which were used in nonsurgical (medical) treatment

Drug	Drug class	Dosage	Time for application	Drug application
Prostaglandin F _{2α}	Synthetic prostaglandin	20-250µg/kg	8-12h	subcutaneous
Cloprostenol	Synthetic prostaglandin	10µg/kg	12h	subcutaneous
Bromocriptine	Dopamine agonist	25µg/kg	8-12h	per oral
Cabergoline	Dopamine agonist	5µg/kg	24 h	per oral
Aglepristone	Progesterone-receptor blocker	10mg/kg	24h	subcutaneous

Conclusion

Based on the results we have conclusions that pyometra as a disease includes senior female dogs that are not neutered, because of the hormonal presence and the best way to avoid this problem is neutering the female dogs which are not used in reproduction, also for avoiding this disease is not using hormonal drugs and the best treatment for this life threaten disease is surgical (ovariohysterectomy) and nonsurgical (medical) treatment is used rarely.

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