

# ABSTRACT

The objectives of this research thesis consist of deep identification, diagnose and deep knowledge of main pathological processes which are taking place on puerperal uterus on female dog and cat. Another objective is the revision of clinic and paraclinic diagnostic criteria in puerperal affections and for settling some connexions between frequency of affections, race, age, number of delivery, the way how the parturition development and other factors which are influencing the female post partum health status.

First part – The Bibliographic study - is systematized in 4 chapters over 74 pages (34.74%), which were elaborated based on the consultations of 235 bibliographic titles from Romanian and foreign literature about morphostructure and physiology of the genital system on female dog and cat, about data on puerperal physiology and about the puerperal affections on domestic female carnivores.

The second part – The personal research - is presented over 139 pages (65.25%) and 6 chapters and includes the purpose, objectives, the material and methods, the obtained results and their interpretations and conclusions.

The study material has been represented by 190 female dogs and 87 female cats which have manifested different affections during their puerperal period. It have been carried out clinical and paraclinical investigations for all consulted animals.

The clinical and paraclinical investigations methods on the females with diffrent affections during their puerperal period have been represent by: anamnesis (100%), abdominal palpation (92.53%), ultrasound examintion (83.95%), vaginal exam (44.02%), biochemical exam (12.63%), cytopathological exam (6.85%) microbiological exam (27.43%), anatomopathological, histological exams (6.49%), hematologic exam (9.02%) and hormonal blood tests (2.88%).

The clinical examination is the investigation method throughout which it can be obtained significat data necessary in deciding the right diagnosis. These data are the result of a general clinical examination, abdominal palpation, rectal examination and examination of copulation conduit.

**The research on pathological puerperium on female dog and female cat** do emphisez on a large range of affections with different severity level, starting with the most simple localized infections up to generalized infections, life threatening to females.

The studied casuistry on female dog and female cat, has been represented by: the uterine subinvolution, placenta retention, metrorrhagia, endometritis, infections of copulation conduit (vulvovaginitis and vestibulitis), prolapsed uterus, eclampsia.

**The uterine subinvolution**, known as lochiometritis, is a post partum increased weakness of the uterus. The uterine subinvolution is more often found on female dog than on female cat and usually affects the youngsters. Clinical examination, ultrasound and histopathological test are necessary to diagnose such.

The use of ultrasound examination emphasized the classical image of puerperal uterus, which looks enlarged and hypoechoic. The uterus wall is thickened with irregular outline and some time ectatic veins can be seen.

**The placenta retention** is characterized by the delay in foetal annexes elimination. This affection has been found in our study to 45 female dogs and 10 female cats.

Clinically it is characterized by dark color vaginal discharge, with enlarged uterus on palpation. A portion of placenta could be seen on vaginal examination

On our cases the placenta retention has been found more often on female, age 5-7 years old, regardless the specie.

Placenta retention diagnosis has been confirmed on ultrasound examination when inside of uterus lumen has been identified a mixture of foetal liquids (anechoic) and tissues from foetal annexes with hyperechoic appearance. The uterus wall can be thickened with irregular outline.

The followings are the complications of the placenta retention: endometritis, purulent metritis, necrotic perforans metritis.

**The metrorrhagia**, known as the subinvolution of the placental sites (SIPS) is often found on female dog, manifested by uterine haemorrhage and appearances of blood between vulvar labium.

In order to establish the diagnose, firstly it had been identified the bleeding site, by examining the vulvar labium and the caudal part of vagina. Secondly it had been transabdominal palpated the uterus. Furthermore it had been carried out ultrasound examination, smear test, anatomopathological and histological tests. The metrorrhagia has been diagnosed on 8 female dogs that represents 4.21% of the total affections on this species.

The results of the morphological investigations point out from the macroscopic point of view the enlargement, flaccidity and fluctuation of the uterus. When open the bands of the areal placentation look dark-red, friable, with anfractuous surface and irregular edges covered by viscous material and blood clots. Inside the uterus there is accumulating dark-red

discharge, with greenish reflections which can get infectious. Histologically it can be noticed severe congestion and edema, perivascular fibrosis and focal melting of the miometrial stratum and the edge of placenta has got haemorrhagic necrosis.

**Endometrial hyperplasia** is the result of exogenous administration of progesterone. Hyperplasia is characterized by thickness of endometrium by 3 to 10 times, compared to its normal size. It is also characterized by abnormal progressive thickness of the mucous membrane up to benign epithelial hyperplasia with irregular increase of number, density and dimension, by losing the alignment of the uterine glands into cystic structures.

The ultrasound examination underlines the parietal hyperplasia, the reduced quantity inside the uterus and different size cysts inside the uterine wall structure.

**Within our research on inflammatory affections on genital tractus on female dog** it has been diagnosed 70 puerperal endometritis. The types of diagnosed puerperal endometritis are: 58 purulency metritis (82.85% ), 10 cases of necrotico-perforance metritis (14.28%) and 2 cases chronical metritis (2.85%).

**The ultrasound examination** highlited enlarged huterus hornes wich contains in a variable amount, anechoic and parietal hypoechoic. In case of cystic puerperal endometritis it can be noticed the tipical aspect of the cysts along endometrium level.

**The result of the microbiological** test reveales that most of germ strains (50 strains) were belong to Gram positive micro-organismes, while most predominant were *Staphylococcus spp.* type (24 strains) and *Streptococcus spp.* type (21 strains). The gram negative micro-organismes (30 strains) it has been represented by the *Escherichia coli* (14 strains), *Pasteurella spp.* (7 strains), *Klebsiella spp.* (6 strains), *Proteus spp.* (3 strains). The micosis types have been identified under *Candida* (3 strain), *Mucor* (1 strain), *Aspergillus* (1 strain). In infectios etiology the bacterian microorganismes are predominant (94.1%), while the yeasts and filamentous fungus are germs without pathogen contamination (5.9 %)

The pathogenity testes carried revealed that for all the 32 investigated cases stands out the diagnose of bacterian infection with synergistically mechanism.

The efficiency of antibiotics and chemotherapy “*in vitro*”, it has been carried out on total microflora and showed that isolated microflora has got rezistance which varies from one case to another. The strains belong to the same species, isolated from different patients, have showed in some situation different sensitivity for the same antibiotics. That proves the necessity of performing the antibiograms for each and every case.

**Anatomopathological**, the uterus is enlarged with thickness of the wall, exudate in lumen, and fragments of mucosa necrosis. On the endometrium surface it can be noticed

flavescent necrosis surrounded by haemorrhagical circles, erosions and ulceration with a dark red frayed aspect.

Histological, big necrosis look non-structurated, delimited by leucocitar barriers and congestivo-haemorrhagical circles. The superficial necrosis, partial empty inside the lumen are ulcerations with loss of substance and full of fibrin and blood ulcerations. The endometrium is lacerated, with big irregular cavities, full of or without fibrin. The corion is infiltrated with polymorphous inflammatory cells. The glands are partial atrophyated and partial flodded by leucocytes and distroyed. Also, the myometrium is inflammatory infiltrated with necrosis and haemorrhage. The serosa is swellewed and coveder by muco-purulent.

Within acute puerperal endometritis the defining elements are reacher in mucous and serosa stratum and their intensity varies depends on the infection virulence and depends on host reactivity. The supeficial endometrium which is the starting point for infection is edematous, hyperaemic and deep infiltrated with leucocytic exudate. This exudat is made out of polymorphonuclear neutrophils.

**The hematological examination** carried out on 15 female dogs diagnosed with puerperal endometritis showed leucocytosis with neutrophils and a few monocytes in blood, are associates with sever anemia.

The association of the granulocytic processes with monocytosis processes on female dog which are diagnosed with puerperal endometritis shows the installation of chronical inflammation, as well as installation of a sever systemic stress.

The medium value of trombocytes to all investigated female dogs it keep within normal limits of  $219.3 \pm 78.98$  mii/ $\mu$ l. In both lots of female diagnosed with endometritis, the individual values had have variation arround this medium value with some exceptions where the trombocytes number have considerably decreased under the standard values of referencing – 200 mii/ $\mu$ l. Therefore, there have been found 5 thrombocytopenia cases. This could be caused by the platelets distruction process while taking place the tissular and vascular repairing processes on animals with massive destructions of the endometrium stratum. These distructions have been generated by the bleeding complications during parturition.

**The biochemical examinations revealed** an increase of urea, creatinine and liver enzymes parameters to superior limits for the majority of female dogs checked, and over the superior limits for the female dogs with sever clinical evolution. For all the studied cases, the alkaline phosphatase has recorded an increase value up to superior limits.

For determination of the hormonal status on female dogs with endometrites it had been checked out the progesterone and estrogene level during the whole treatment period. The

results obtained in dynamic process on the day of treatment and then every 48 hours over the treatment period.

As known, during the parturition, the hormonal dosing shows a sharp decrease of the estrogenic and progesterone level, due to PgF<sub>2</sub>-alpha releasing which has a luteal effect. During this research study, the progesterone level was high, fact which can be explained by the evolution of inflammatory process of the uterine mucosa. This process leads to interference of PgF<sub>2</sub>-alpha releasing mechanism, with luteal role, or to increased enzymatic destruction of the tissular hormone.

Once the treatment established it can be noticed a gradually slow down of the progesterone and estrogenic level. Herewith, the estrogenic medium value on female dogs with puerperal endometritis at the moment of diagnose, was 7.9pg/ml, value which has declined on last day of treatment up to 6.2 pg/ml. The progesterone medium value at the moment of diagnose on female dogs with puerperal endometritis was 11.3 ng/ml and on last day of treatment, the medium value decreased up to 6.7 pg/ml.

**The inflammatory affections on genital tractus on female cat.** 44 female cats, representing 50.57% of the total studied cases have been diagnosed with puerperal purulent endometritis.

**Ultrasound examination** disclosed enlarged uterine horns, enlargement formed up by a variable amount of anechoic content and endometrium hyperplasia of different degrees. Also, within cystic puerperal endometritis it can be noticed the presence of endometrial cysts.

**The microbiological examination** on samples of uterine secretions in puerperal endometritis from female cat has revealed 31 strains of bacteria, out of which 54.8% – 17 cases are Gram negative micro-organisms and 45.2% - 14 cases are Gram positive micro-organisms.

The analysis of the action spectrum of the antibacterial substance, reveals that a moderate inhibitor effect controls the majority of studied cases.

The efficiency of *in vitro* antibiotics on isolated microflora of uterine secretions, reveals that the resistance varies for same bacterial species. This emphasizes on the necessity of performing the antibiogram for each and every case.

**The smear test** collected from uterine mucosa reveals a big number of inflammatory polymorph cells. The most numerous are the neutrophilic granulocytes, intact or degenerated, mixed with few lymphocytes, macrophages and/or full of dense corpus, cytoplasmic, nucleus and bacterial remainings, many nearly destroyed cells, very rare fusiform cells (scraped from

the ulcerative corion) and many isolated or grouped germs on blueish background made by plasma.

The hematological examination carried out on 10 female cats shows leucocytosis with severe neutrophilia. The leucocytes medium value is  $22.9 \pm 2.4$  mii/ $\mu$ l, higher than the standard value of referencing (12.5 mii/ $\mu$ l) and higher than the superior limit, considered within normal range (5.5-19.5 mii/ $\mu$ l). The medium number of granulocytes on female cats investigated was  $17.2 \pm 2.1$  mii/ $\mu$ l. All female cats with endometritis has values higher than the superior standard limit (2.5-14.5 mii/ $\mu$ l). The results of the hematological examination releaves sever leucocytosis and granulocytosis, fact which characterizes the evolution of the acute inflammatory processes.

**The obtained results from the conduit copulation** infections during puerperium period on domestic female carnivores have revealed the diagnosis of vulvovaginitis and vestibulitis on 19 female dogs and on 14 female cats, out of all studied cases.

The inflamatory diseases of the copulator conduit for female dogs and female cats, has releaved a common microbial etiology.

The smear test shows a moderate inflamatory reaction, the catarrhal type with neutrophiles, lymphocytes, erythrocytes and different bacterias.

**The uterine prolapse** is an accident caused by invagination of one or both uterine horns up to total the inversion of the uterus between labium vulvae. Usually, it takes place right after the fetuses expulzion. It is less often found on female dogs compared to other species. In our research study we have diagnosed 2 such cases of female dogs and 1 case of female cat.

**Puerperal eclampsia** is a nevrosis most often found on female dogs, right after delivery, once the lactate secretion is being settled. Pureperal eclampsia is the result of hypocalcaemia, manifested by convulsion crises (tonic and clonic contractions), repeatedly over short periods of time and and by superior nervous affections. The biochemical examination done on 14 female diagnosed with puerperal eclampsia, reveales hypoglycaemia along with hypocalcaemia.

Because the glucose constitutes the main energetic substrat of the nervous system, severe hypoglycaemia leads to clinical neurological manifestations.

**General therapeutic methods in puerperale affections on female dogs and female cats:**

- medical methods – the use of uterotonic substances (ocitocina, PGF2 alpha, and calcium salt) and the use of maintenance therapy (the administration of intra venous fluids) and anti-inflammatory therapy.

- surgical therapeutical methods – ovario-hysterectomy, done on classical consecratory way.

**The thesis** encloses a number of 251 pages, including: 108 figures, 17 tables, and 11 bibliographical pages.

Furthermore, the present work has attached the following materials: The Introduction – 3 pages, The Abstract – 7 pages, The Summary – 3 pages, The published scientific research -12 pages, Curriculum Vitae - 3 pages.